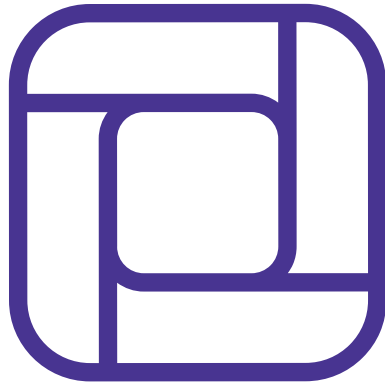




hales[®]

Tooling, Moulding & Industrial Supplies

**2025
PRODUCT CATALOGUE**



hales[®]

**TOOLING,
MOULDING &
INDUSTRIAL SUPPLIES**



PLASTIC TOOLING COMPONENTS - 5



MOULDING SUPPLIES - 125



END OF ARM TOOLING - 195



PRESS TOOLING - 221



INDUSTRIAL PRODUCTS - 267



LUBRICANTS, OILS & GREASES - 373



MOULD BASES

■ Mould Base Specifications	6
■ Mould Bases JIS Standard	7
■ Mould Bases – Custom	37
■ Mould Bases – Special Requests	38

EJECTOR PINS

■ Ejector Pins – JIS Stepped Nitrided Metric	39
■ Ejector Pins – JIS Straight Nitrided Metric	40
■ Ejector Pins – JIS Oversize Nitrided Metric	41
■ Ejector Pins – JIS Soft Core Metric	42
■ Ejector Sleeves – JIS Metric	43
■ Ejector Blades – JIS Metric	44
■ Ejector Pins – JIS Through Hardened	45
■ Ejector Pins – DIN Through Hardened	46
■ Ejector Pins – Stepped Imperial	47
■ Ejector Pins – Straight Imperial	48
■ Ejector Pins – Oversize Stepped Imperial	49
■ Ejector Pins – Oversize Straight Imperial	49
■ Core Pins – Imperial	50
■ Ejector Sleeves – Imperial	51

ALIGNMENT

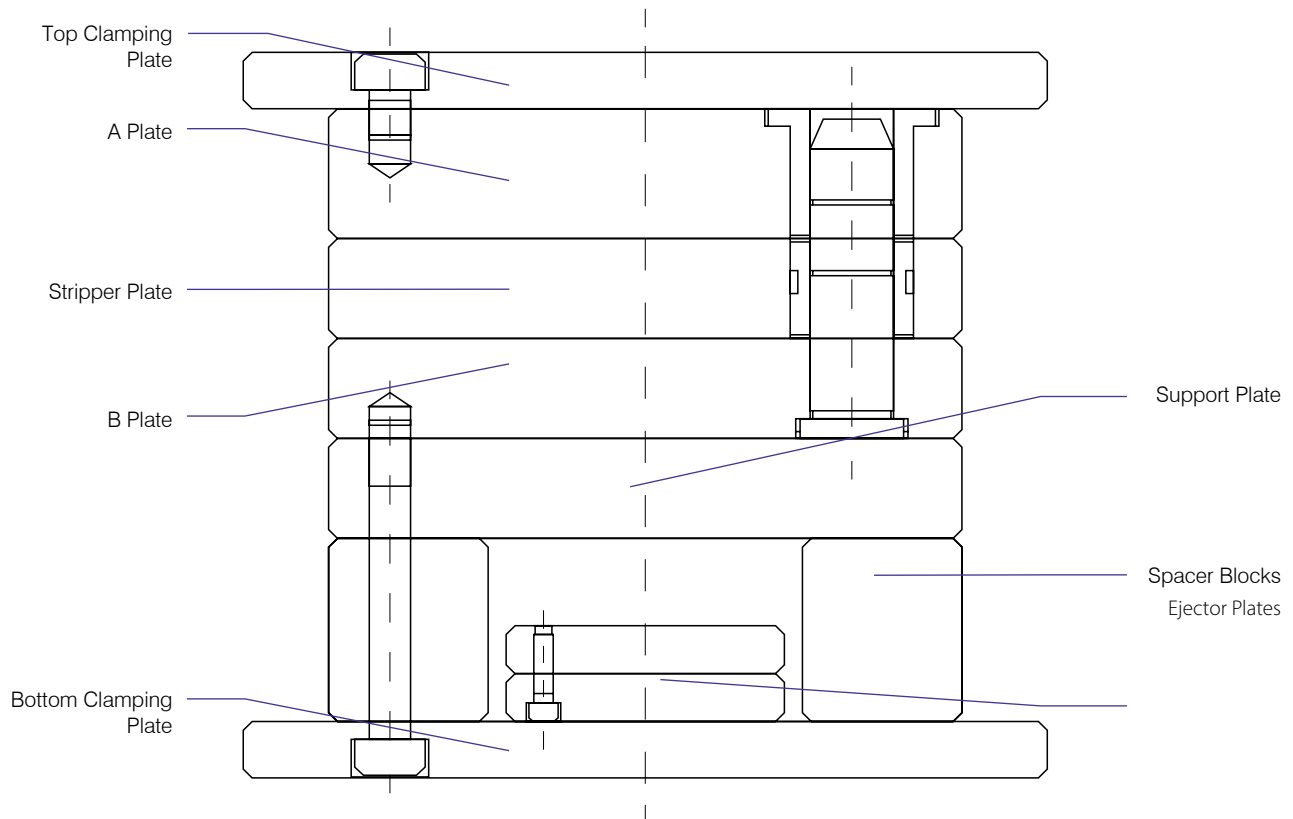
■ Stepped Guide Pins – Metric	52
■ Leader Pins – Metric	53
■ Guide Bushes – Metric	54
■ Bronze Bushes – Metric	55
■ Regent Pins and Bushes – Metric	56
■ Inch Pins and Bushes – Imperial	56
■ Stepped Guide Pins – Imperial	57
■ Guide Bushes – Imperial	62
■ Tapered Interlock Set	63
■ Side Locks	64
■ Guide Bar	66
■ Block Sets	67
■ Ejection Bush – Guided Bronze	68
■ Ejector Bush – Graphite	68
■ Angle Pins	69

MOULD ACTIONS & ACCESSORIES

■ Ejector Couplers	70
■ Air Ejector Coupler	71
■ FasTie Coupler & Stud	72
■ Parting Locks	73
■ Sprung Cores	74
■ Flexible Cores	75
■ Ejectors – Tulip & Double	76
■ Vacuumjet System	78
■ Hydraulic Cylinders	79
■ Plate Accelerators	80
■ Slide Retainers	81
■ Modular Retainers	84
■ Latch Locks	85
■ Air Poppets & Valves	87
■ Moulding Date Inserts	89
■ Date Stamps	90
■ Mould Identification Inserts	91
■ Recycle Inserts	92
■ Sprue Bushes	93
■ Sprues – Finished	93
■ Location Rings	93
■ Insulation Sheet	94
■ Sintered Vents	94
■ Tunnel Gate Inserts	95

HOT RUNNER SYSTEMS

■ System Selection Guides	96
■ Nozzles	102
■ Valve Gates	105
■ Manifold Systems	109
■ Tips	111
■ Nozzle Heaters	112
■ Rear Heaters	113
■ Heater Covers	115
■ Nozzle Heaters Sleeved	116
■ Heater Caps	117
■ Thermocouples	118
■ Bush Nuts	118
■ Sprue Nuts	119
■ Open Nuts	120
■ Spare Parts Range	122
■ Spare Parts Range – Manifolds	123



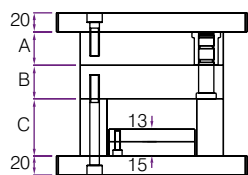
All standard mould bases 600mm x 600mm and over have lifting holes.
For non standard mould base quotes please refer to last page for size specification template.

Plate Type	Material	Thickness Tolerance	Length Tolerance	Width Tolerance
Top Clamping Plate	SC50	+0.5/0	+0.3/+0.1	+0.4/+0.1
A Plate	2311 or equivalent	+0.5/0	+1./+0.3	+1.0/+0.3
Stripper Plate (C Type)	2311 or equivalent	+0.5/0	+0.3/+0.1	+0.4/+0.1
B Plate	2311 or equivalent	+0.5/0	+1./+0.3	+1.0/+0.3
Support Plate	SC50	+0.5/0	+0.3/+0.1	+0.4/+0.1
Spacer Blocks	SC50 ++0.17/+0.15 (c) 30-40 series +0/-10 (b) above 300mm	(a) 300mm or less (b) 25 series = +/-0.8 (d) 45 series plus =+0/-1.2	+0.3/+0.1 +0.17/+0.13	(a) 15-20 series = +0/-0.5
Ejector Plates	SC50	+0.5/0	+0.3/+0.1	+0.4/+0.1
Bottom Clamping Plate	SC50	+0.5/0	+0.3/+0.1	+0.4/+0.1

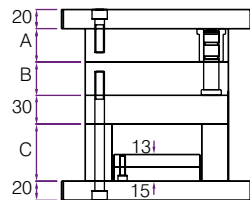
For safety reasons, some assembled mould bases now come with lifting holes.
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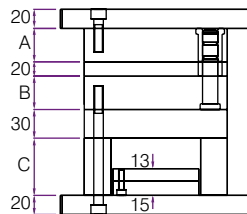
A Type



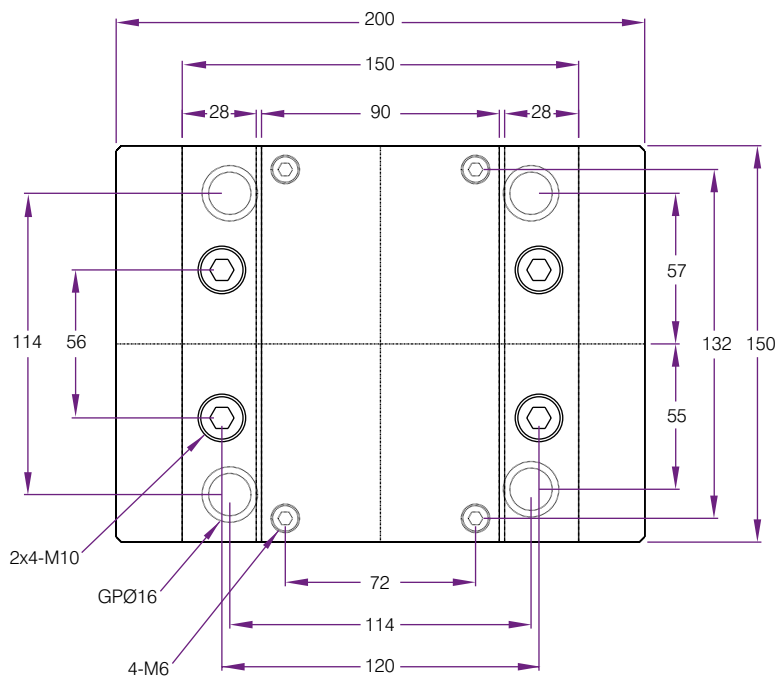
B Type



C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
25	25	60	
25	30	60	
25	35	60	◆
25	40	60	
25	50	70	
25	60	80	
30	25	60	
30	30	60	◆
30	35	60	
30	40	60	
30	50	70	
30	60	80	
35	25	60	
35	30	60	◆
35	35	60	
35	40	60	
35	50	70	◆
35	60	80	
40	25	60	
40	30	60	
40	35	60	
40	40	60	◆
40	50	70	
40	60	80	
50	25	60	
50	35	60	
50	40	60	
50	50	70	◆
50	60	80	
60	25	60	
60	30	60	
60	35	60	
60	40	60	
60	50	70	
60	60	80	◆
70	40	60	
70	50	70	
70	60	80	
70	70	80	◆
100	100	100	◆



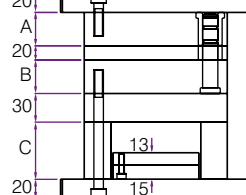
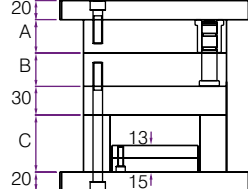
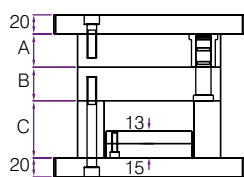
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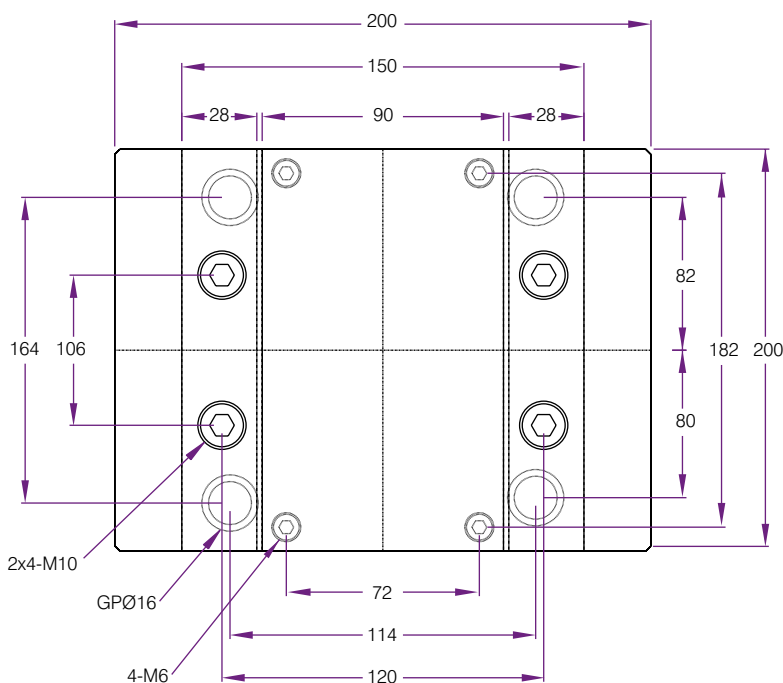
A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
25	25	60	
25	30	60	
25	35	60	
25	40	60	
25	50	70	
25	60	80	
30	25	60	
30	30	60	◆
30	35	60	
30	40	60	
30	50	70	
30	60	80	
35	25	60	
35	30	60	
35	35	60	◆
35	40	60	
35	50	70	◆
35	60	80	
40	25	60	
40	30	60	
40	35	60	
40	40	60	◆
40	50	70	
40	60	80	◆
50	25	60	
50	35	60	
50	40	60	
50	50	70	◆
50	60	80	
50	80	90	◆
60	25	60	
60	30	60	
60	35	60	
60	40	60	
60	50	70	
60	60	80	◆
70	40	60	
70	50	70	
70	60	80	
70	70	80	◆
80	80	100	◆
80	100	120	◆



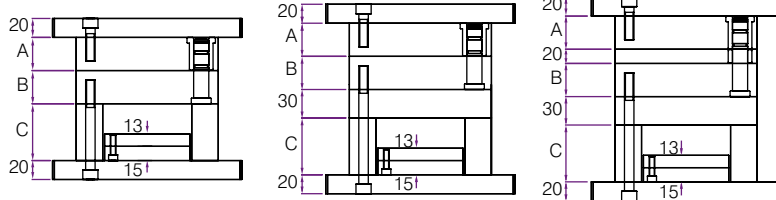
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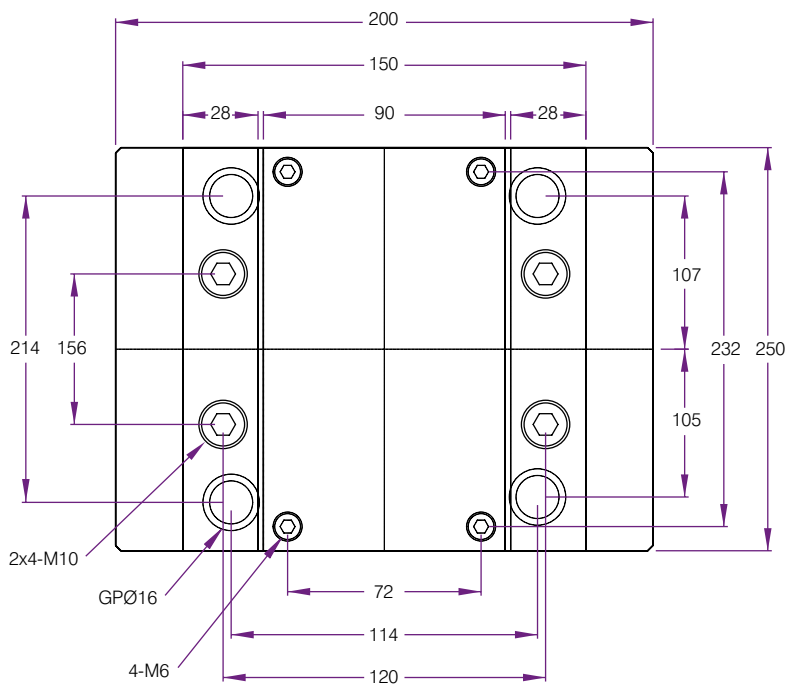
A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
25	25	60	
25	30	60	
25	35	60	
25	40	60	
25	50	70	
25	60	80	
30	25	60	
30	30	60	◆
30	35	60	
30	40	60	
30	50	70	
30	60	80	
35	25	50	
35	30	60	
35	35	60	◆
35	40	60	
35	50	70	
35	60	80	
40	25	60	
40	30	60	
40	35	60	
40	40	60	
40	50	70	
40	60	80	
50	35	60	
50	35	60	
50	40	60	
50	50	70	
50	60	80	
60	30	60	
60	35	60	
60	40	60	
60	50	70	
60	60	80	
70	40	60	
70	50	70	
70	60	80	
70	70	80	



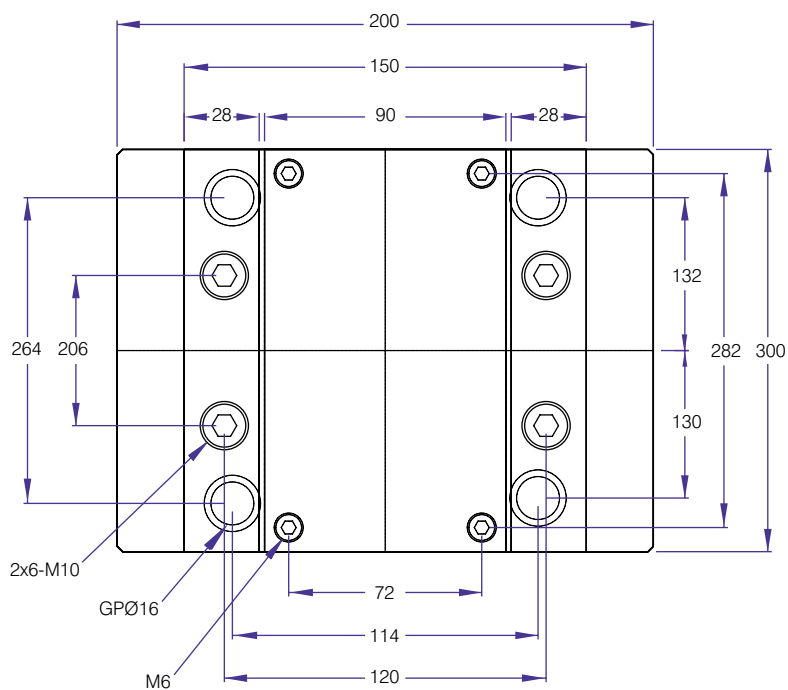
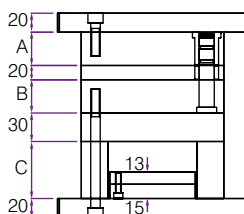
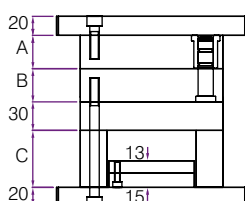
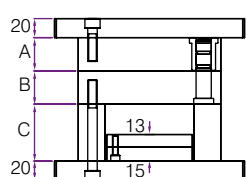
For safety reasons, some assembled mould bases now come with lifting holes.
Please enquire with your sales person before confirming your order.



A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
25	25	60	
25	30	60	
25	35	60	
25	40	60	
25	50	70	
25	60	80	
30	25	60	
30	30	60	
30	35	60	
30	40	60	
30	50	80	
30	60	80	
35	25	60	
35	30	60	
35	35	60	
35	40	60	
35	50	80	
35	60	80	
40	25	60	
40	30	60	
40	35	60	
40	40	60	
40	50	70	
40	60	80	
50	25	60	
50	35	60	
50	35	60	
50	40	60	
50	50	70	◆
50	60	80	
60	25	60	
60	30	60	
60	35	60	
60	40	60	
60	50	70	
60	60	80	
70	40	60	
70	50	70	
70	60	80	
70	70	80	

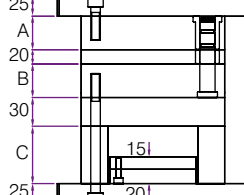
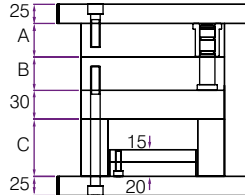
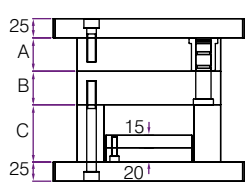
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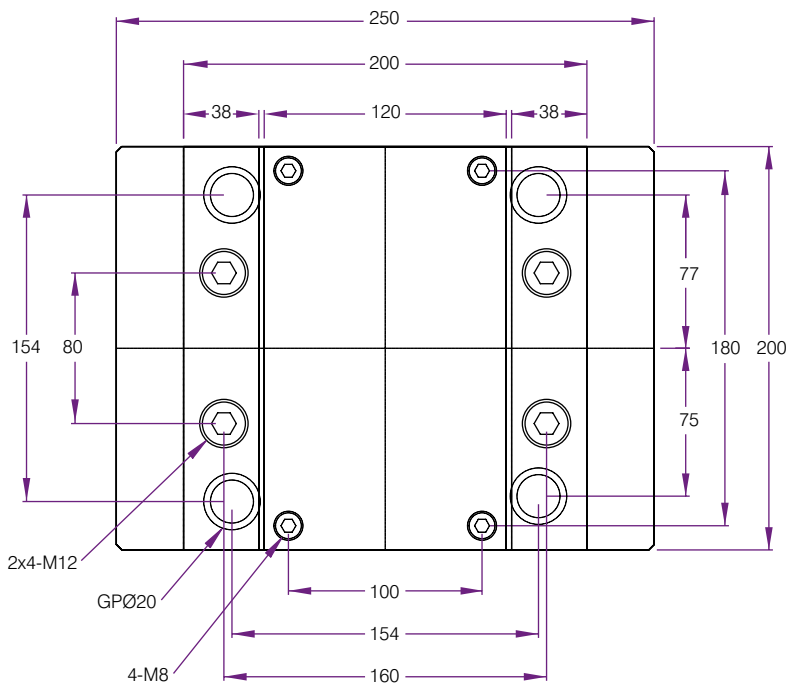
A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
25	25	70	
25	30	70	
25	35	70	
25	40	70	
25	50	70	◆
25	60	70	
30	25	70	
30	30	70	◆
30	40	70	
30	50	80	
30	60	80	
35	25	70	
35	30	70	
35	35	70	◆
35	40	70	
35	50	70	◆
35	60	80	
40	25	70	
40	30	70	
40	35	70	
40	40	70	◆
40	50	80	
40	60	80	
50	25	70	
50	35	70	
50	35	70	
50	40	70	
50	50	70	◆
50	50	80	
50	60	80	
60	25	70	
60	30	70	
60	35	70	
60	40	70	
60	50	80	
60	60	80	◆
70	40	70	
70	50	80	
70	60	80	
70	70	80	◆
70	80	100	
80	40	70	
80	50	80	
80	60	80	
80	70	80	
80	80	100	◆



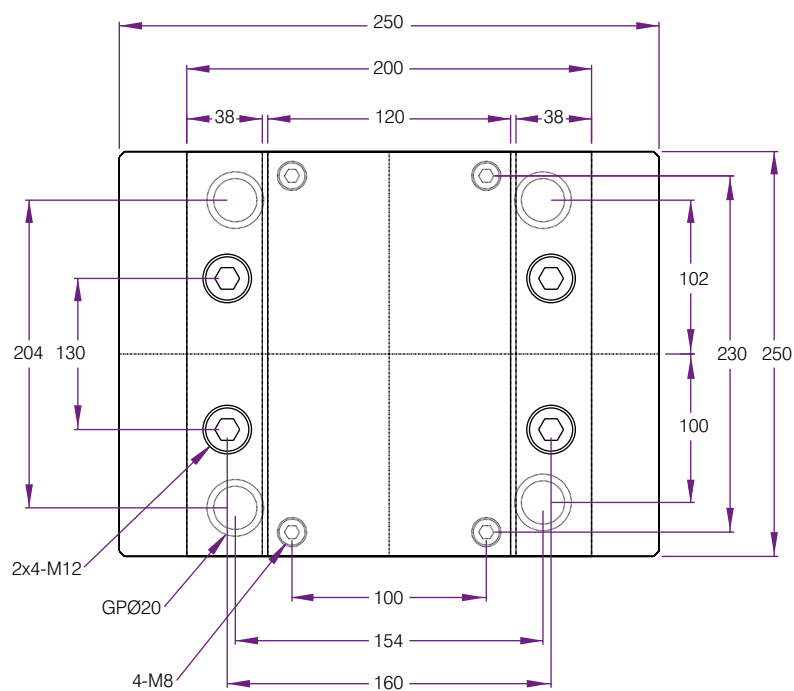
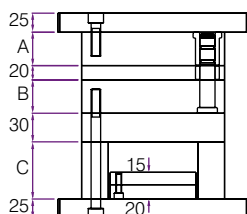
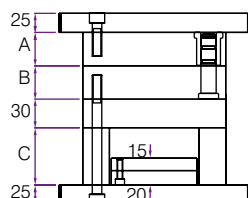
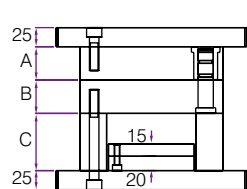
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A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
25	25	70	
25	30	50	
25	35	70	
25	40	60	
25	50	70	
25	60	70	
30	25	50	
30	30	70	
30	35	60	
30	40	60	
30	50	70	
30	60	70	
35	25	70	
35	30	50	
35	35	70	◆
35	40	60	
35	50	70	◆
35	60	80	
40	25	70	
40	30	70	
40	35	70	
40	40	70	◆
40	50	70	
40	60	70	
50	35	70	
50	35	60	
50	40	60	
50	50	70	◆
50	70	80	◆
60	25	50	
60	30	50	
60	35	70	
60	40	60	
60	50	70	
60	60	80	◆
60	80	80	◆
70	40	70	
70	50	70	
70	60	80	
70	70	80	◆
70	80	90	
70	100	90	
80	40	70	
80	50	70	
80	60	70	
80	70	90	
80	80	100	◆
100	100	120	

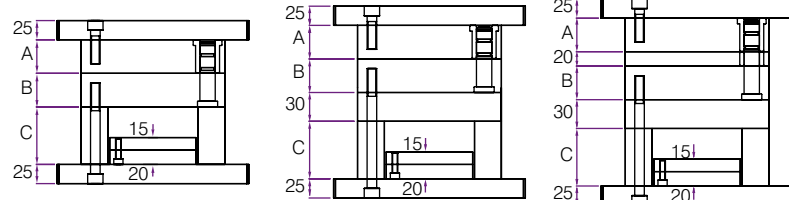
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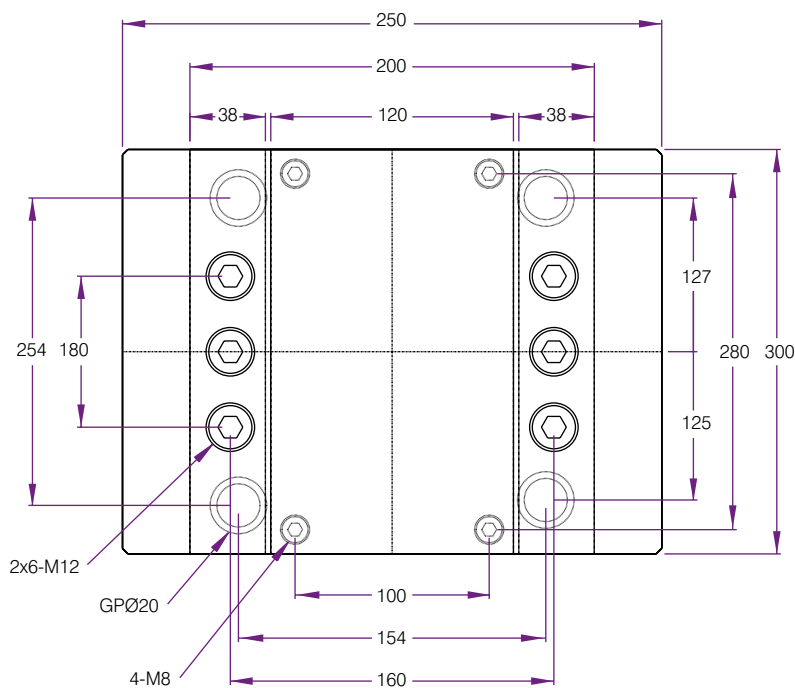
A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
25	35	70	
25	40	70	
25	50	80	
35	25	70	
35	35	70	◆
35	40	70	
35	50	80	
35	60	80	
35	70	80	
35	80	100	
40	40	70	◆
40	50	80	
40	60	80	
40	70	80	
40	80	100	
50	35	70	
50	40	70	
50	50	70	◆
50	60	80	
50	80	100	
60	35	70	
60	50	80	
60	60	80	◆
60	70	80	
60	80	100	
70	40	70	
70	50	80	
70	60	80	
70	70	80	
70	80	100	
80	40	70	
80	50	80	
80	60	80	
80	70	80	
80	80	100	



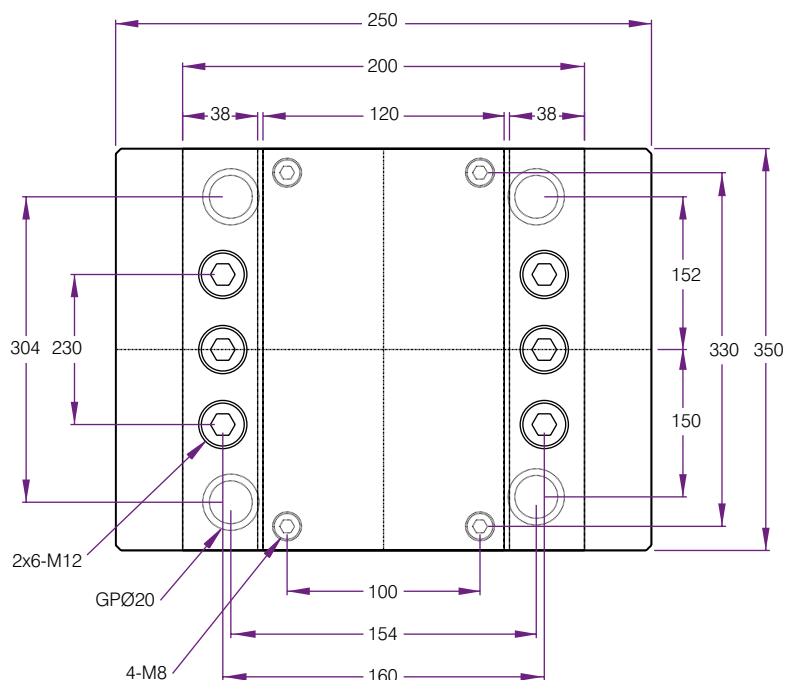
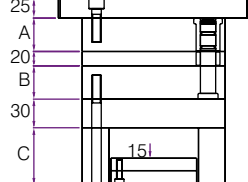
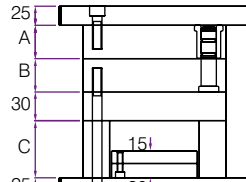
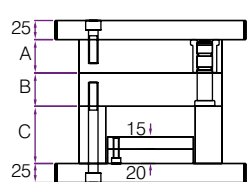
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A Type

B Type

C Type

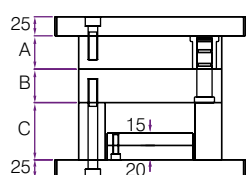


A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
25	35	70	
25	40	70	
25	50	80	
25	60	80	
25	70	80	
35	35	70	
35	40	70	
35	50	80	
35	60	80	
35	70	80	
35	80	100	
40	25	70	
40	40	70	◆
40	50	70	
40	60	80	
40	70	80	
40	80	100	
50	35	70	
50	40	70	
50	50	80	
50	70	80	
50	80	100	
60	40	70	
60	50	80	
60	60	80	◆
60	80	100	
70	35	70	
70	40	70	
70	50	80	
70	60	80	
70	70	80	
70	70	100	◆
80	40	70	
80	50	80	
80	60	80	
80	70	80	
80	80	100	◆

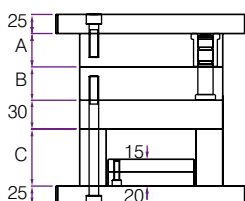
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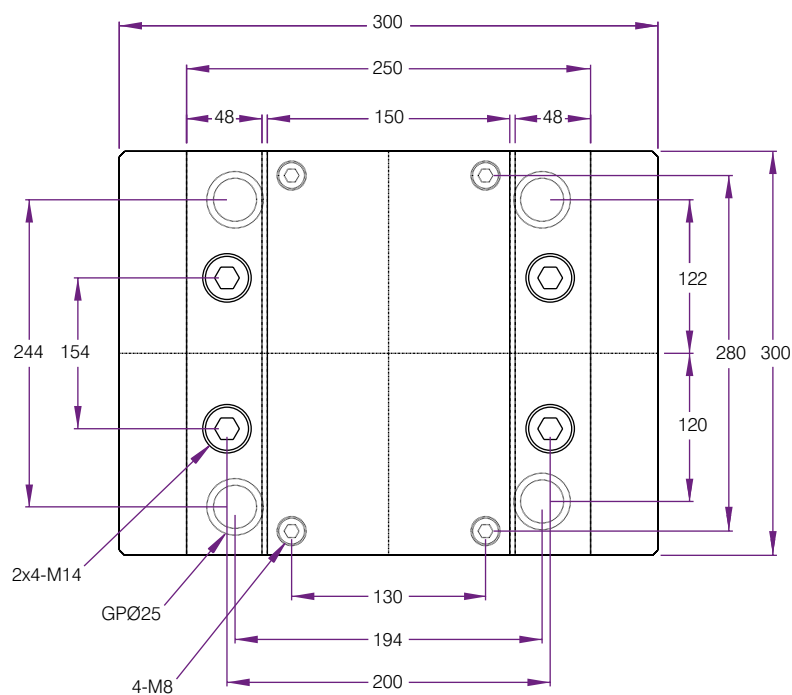
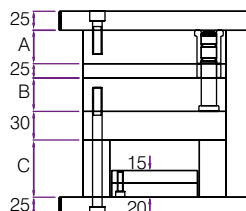
A Type



B Type



C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
30	50	80	
35	35	80	
35	50	80	
35	60	80	
35	70	90	
35	80	110	
35	100	110	
40	35	80	
40	40	70	◆
40	50	80	
40	60	80	
40	70	90	
40	80	110	
40	100	110	
50	35	80	
50	40	80	
50	50	80	◆
50	60	80	
50	70	90	
50	80	110	
50	80	110	
60	35	80	
60	50	80	
60	60	80	◆
60	70	90	
60	80	110	
60	80	90	
70	60	80	
70	70	90	◆
70	80	110	
70	100	110	
80	40	80	
80	60	80	
80	60	80	
80	80	100	◆
80	100	110	
100	35	80	
100	40	80	
100	50	80	
100	60	80	
100	70	90	
100	80	110	
100	100	110	

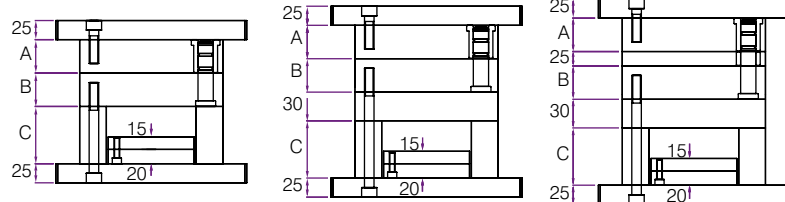
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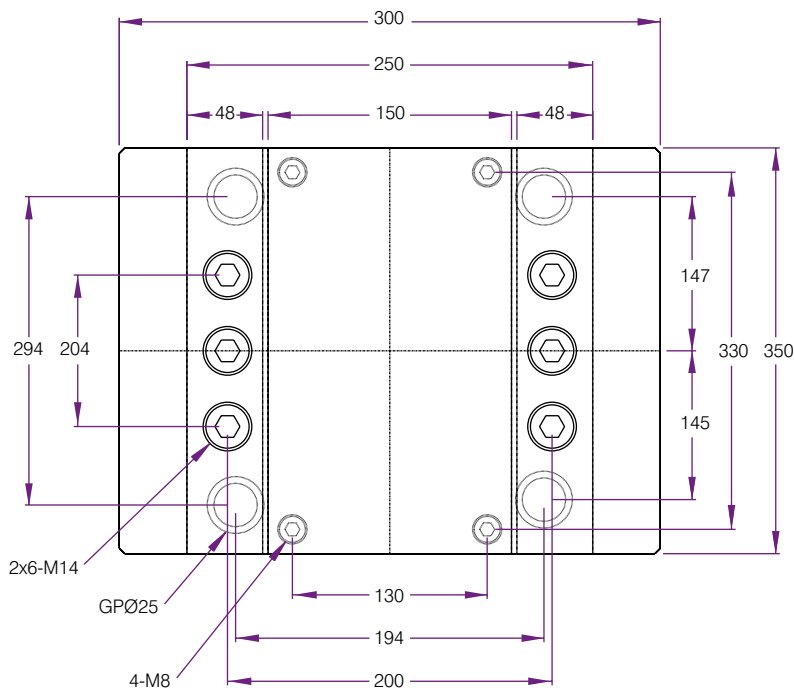
A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
35	35	80	
35	40	80	
35	50	80	
35	60	80	
35	70	90	
35	80	90	
35	100	110	
40	35	80	◆
40	40	80	
40	50	80	
40	60	80	
40	70	90	
40	80	90	
40	100	110	
50	35	80	
50	40	80	
50	50	80	
50	60	80	
50	80	110	
50	100	110	
60	35	80	
60	40	80	
60	50	80	
60	60	80	◆
60	70	90	
60	80	80	
60	100	110	
70	35	80	
70	40	80	
70	50	80	
70	60	80	
70	80	80	
70	100	110	
80	35	80	
80	40	80	
80	50	80	
80	60	80	
80	70	90	
80	80	110	
80	100	110	
100	35	80	
100	40	80	
100	50	80	
100	60	80	
100	70	90	
100	80	80	
100	100	110	



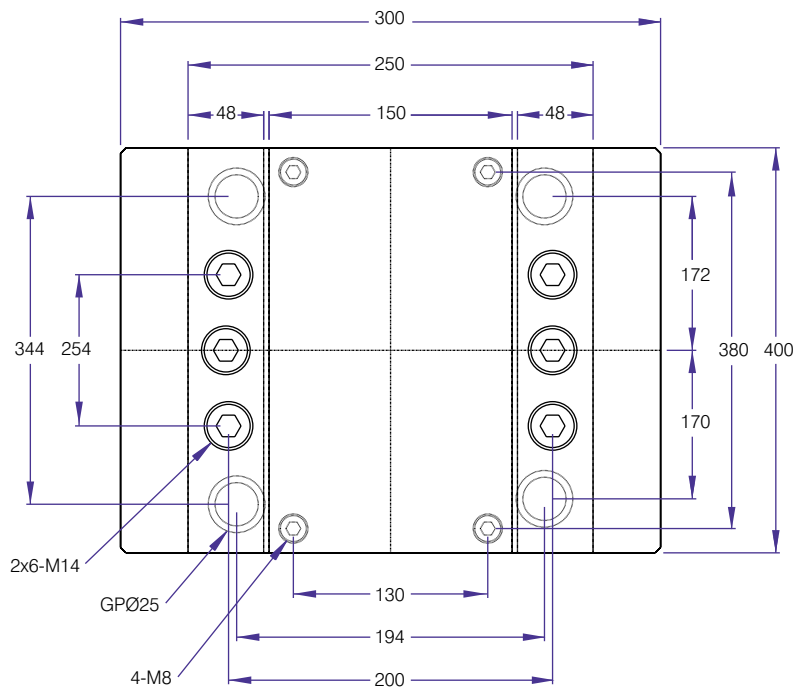
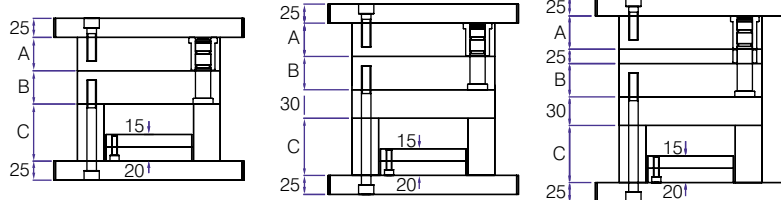
For safety reasons, some assembled mould bases now come with lifting holes.
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A Type

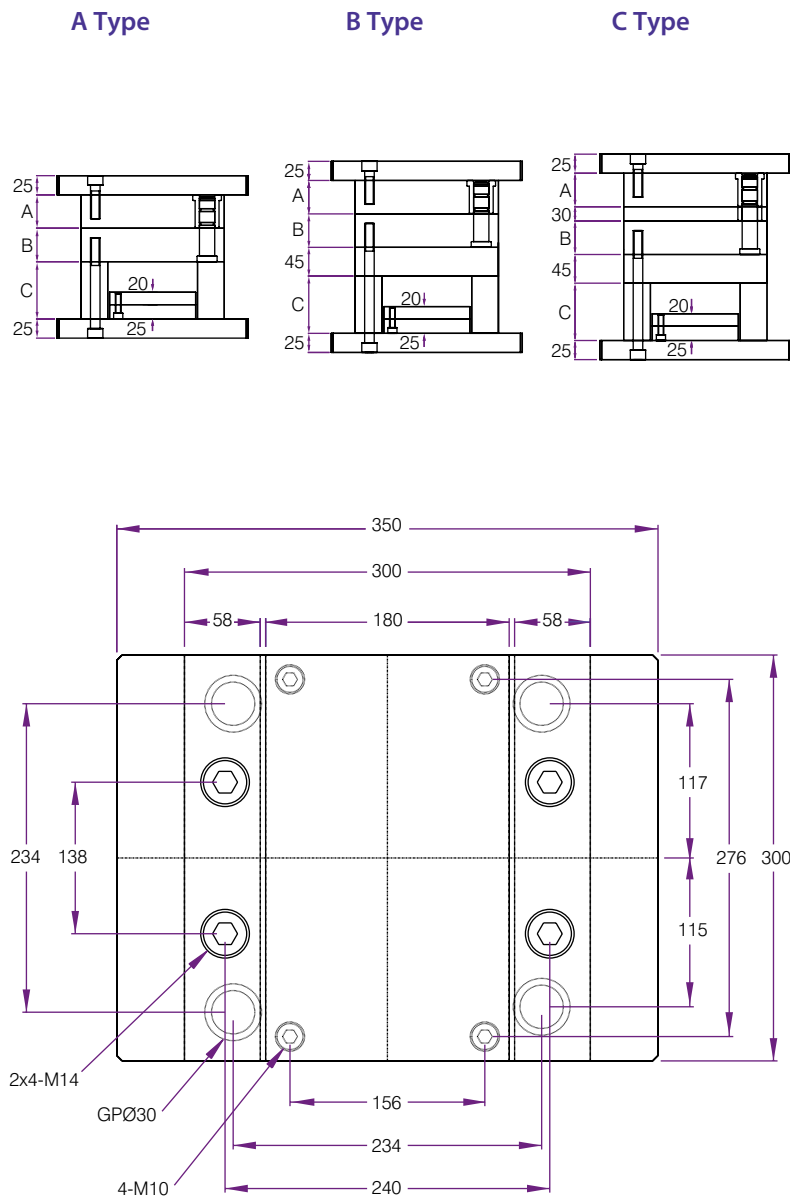
B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
35	35	80	
35	40	80	
35	50	80	
35	60	80	
35	70	90	
35	80	110	
35	100	110	
40	35	80	
40	40	80	◆
40	50	80	
40	60	80	
40	70	90	
40	80	110	
40	100	110	
50	35	80	
50	40	80	
50	50	80	
50	60	80	
50	70	90	
50	80	80	◆
50	100	110	
60	35	80	
40	40	80	
60	50	80	
60	60	80	◆
60	70	90	
60	80	110	
60	100	110	
70	35	80	
70	40	80	
70	50	80	
70	60	80	
70	70	90	
70	80	110	
70	100	110	
80	35	80	
80	40	80	
80	50	80	
80	60	80	
80	70	90	
80	80	100	◆
80	100	110	
80	120	110	
100	40	80	
100	50	80	
100	60	80	
100	70	90	
100	80	110	
100	100	110	
100	120	140	◆

For safety reasons, some assembled mould bases now come with lifting holes.
Please enquire with your sales person before confirming your order.



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
35	35	90	
35	40	90	
35	50	90	
35	60	90	
35	70	90	
35	80	100	
35	100	120	
40	35	90	
40	40	90	
40	50	90	
40	60	90	
40	70	90	
40	80	100	
40	100	120	
50	35	90	
50	40	90	
50	50	80	◆
50	60	90	
50	70	90	◆
50	80	100	
50	100	120	
60	35	90	
60	40	90	
60	50	90	
60	60	90	◆
60	70	90	
60	80	100	
60	100	120	
70	35	90	
70	40	90	
70	50	90	
70	60	90	
70	70	90	◆
70	80	100	
70	100	120	
80	35	90	
80	40	90	
80	50	90	
80	60	90	
80	70	90	
80	80	100	◆
80	100	120	
100	35	90	
100	40	90	
100	50	90	
100	60	90	
100	70	90	
100	80	100	
100	100	120	

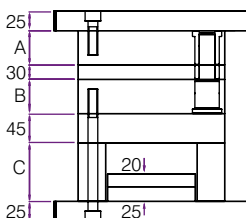
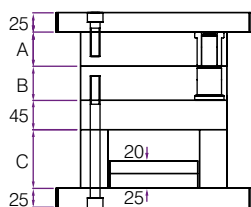
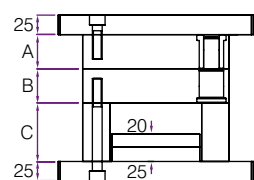
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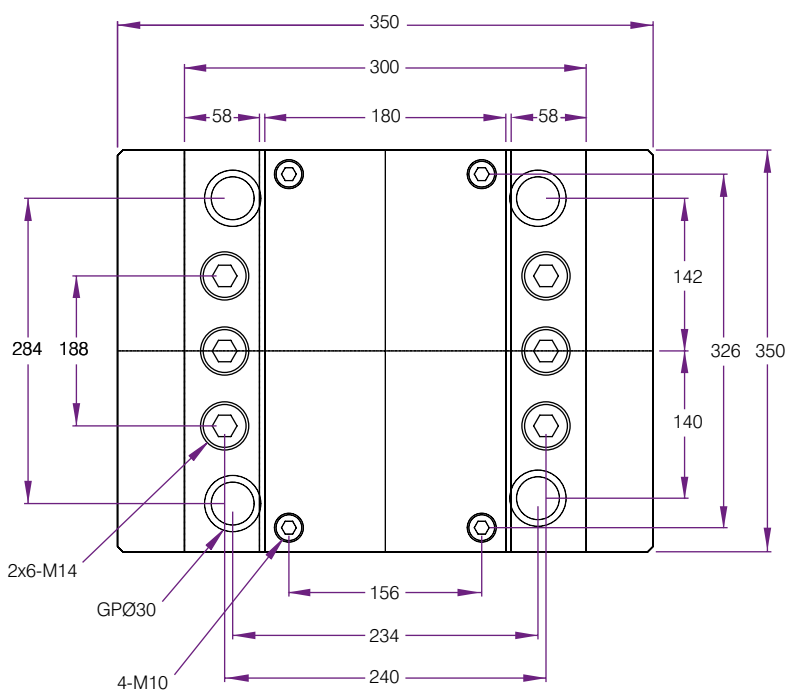
A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
35	35	90	
35	40	90	
35	50	90	
35	60	90	
35	70	90	
35	80	100	
35	100	120	
40	35	90	
40	40	90	
40	50	90	
40	60	90	
40	70	90	
40	80	100	
40	100	120	
50	35	90	
50	40	90	
50	50	70	◆
50	60	90	
50	70	90	
50	80	100	
50	100	120	
60	35	90	
60	40	90	
60	50	90	
60	60	90	◆
60	70	90	
60	80	100	
60	100	120	
70	35	90	
70	40	90	
70	50	90	
70	60	90	
70	70	90	
70	80	100	
70	100	120	
80	35	90	
80	40	90	
80	50	90	
80	60	90	
80	70	90	
80	80	100	◆
80	100	120	
100	35	90	
100	40	90	
100	50	90	
100	60	90	
100	70	90	
100	80	100	
100	100	120	◆
120	120	140	◆



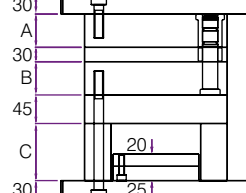
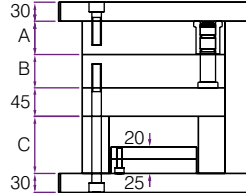
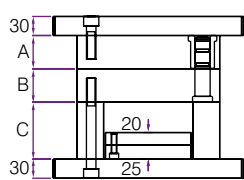
For safety reasons, some assembled mould bases now come with lifting holes.
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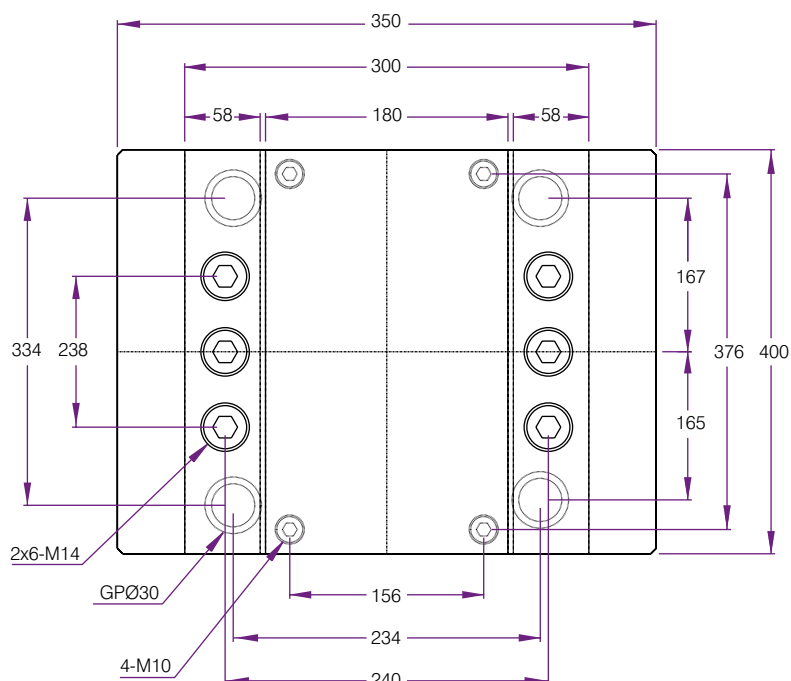
A Type

B Type

C Type



A Fixed Plate	B Moving Plate	C Spacer Block	Stock Line
35	35	90	
35	40	90	
35	50	90	
35	60	90	
35	70	90	
35	80	100	
35	100	120	
40	35	90	
40	40	90	
40	50	90	
40	60	90	
40	70	90	
40	80	100	
40	100	120	
50	35	90	
50	40	90	
50	50	90	
50	60	90	
50	70	90	
50	80	100	
50	100	120	
60	35	90	
60	40	90	
60	50	90	
60	60	90	◆
60	70	90	
60	80	100	
60	100	120	
70	35	90	
70	40	90	
70	50	90	
70	60	90	
70	70	90	
70	80	100	
70	100	120	
80	35	90	
80	40	90	
80	50	90	
80	60	90	
80	70	90	
80	80	100	◆
80	100	120	
100	35	90	
100	40	90	
100	50	90	
100	60	90	
100	70	90	
100	80	100	
100	100	120	◆



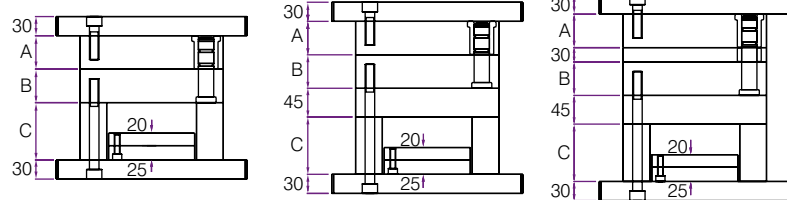
For safety reasons, some assembled mould bases now come with lifting holes.
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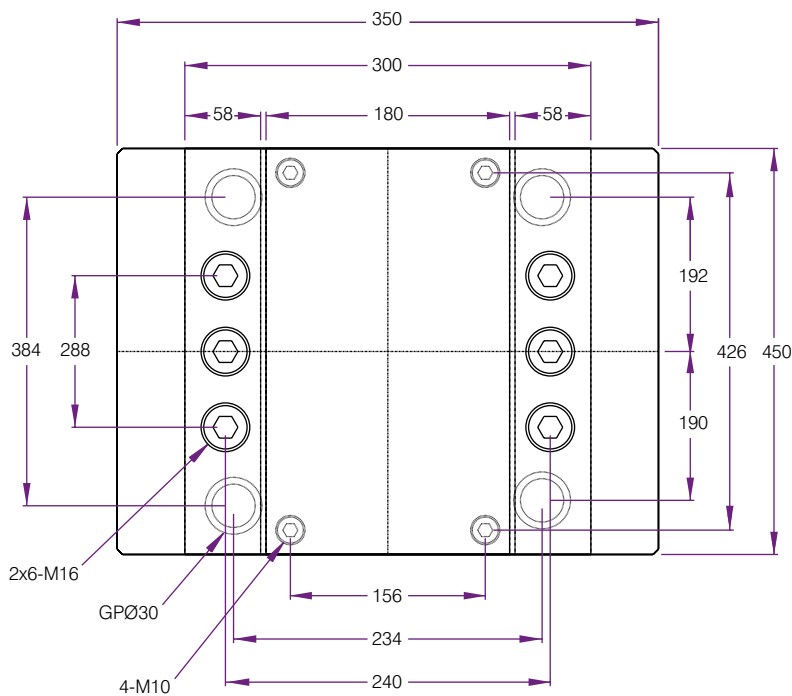
A Type

B Type

C Type



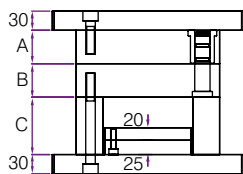
A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
35	35	90	
35	40	90	
35	50	90	
35	60	90	
35	70	90	
35	80	100	
35	100	120	
40	35	90	
40	40	90	
40	50	90	
40	60	90	
40	70	90	
40	80	100	
40	100	120	
50	35	90	
50	40	90	
50	50	90	◆
50	60	90	
50	70	90	
50	80	100	
50	100	120	
60	35	90	
60	40	90	
60	50	90	
60	60	90	◆
60	70	90	
60	80	100	◆
60	100	120	
70	35	90	
70	40	90	
70	50	90	
70	60	90	
70	70	90	◆
70	80	100	
70	100	120	
80	35	90	
80	40	90	
80	50	90	
80	60	90	
80	70	90	
80	80	100	
80	100	120	
100	35	90	
100	40	90	
100	50	90	
100	60	90	
100	70	90	
100	80	100	◆
100	100	120	◆



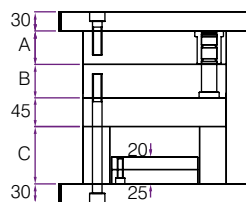
For safety reasons, some assembled mould bases now come with lifting holes.
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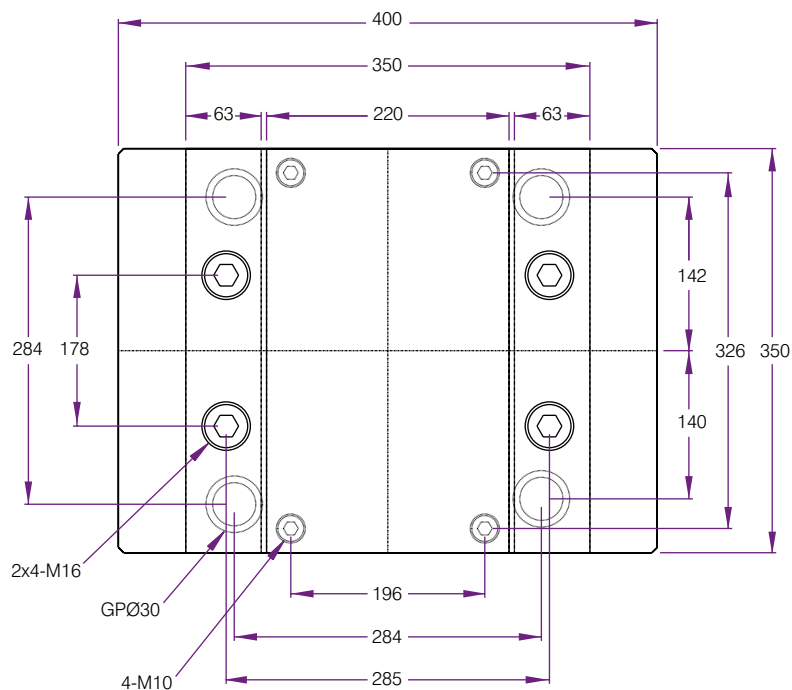
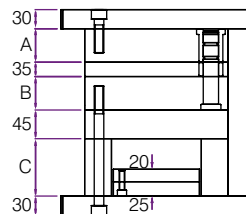
A Type



B Type



C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
40	40	100	
40	50	100	
40	60	100	
40	70	100	
40	80	100	
40	100	130	
50	40	100	
50	50	100	◆
50	60	100	
50	70	100	
50	80	100	
50	100	130	
60	40	100	
60	50	100	
60	60	100	◆
60	70	100	
60	80	100	
60	100	130	
70	40	100	
70	50	100	
70	60	100	
70	70	100	
70	80	100	
70	100	130	
80	40	100	
80	50	100	
80	60	100	
80	70	100	
80	80	100	
80	100	120	◆
80	120	150	◆
100	40	100	
100	50	100	
100	60	100	
100	70	100	
100	80	100	
100	100	120	◆

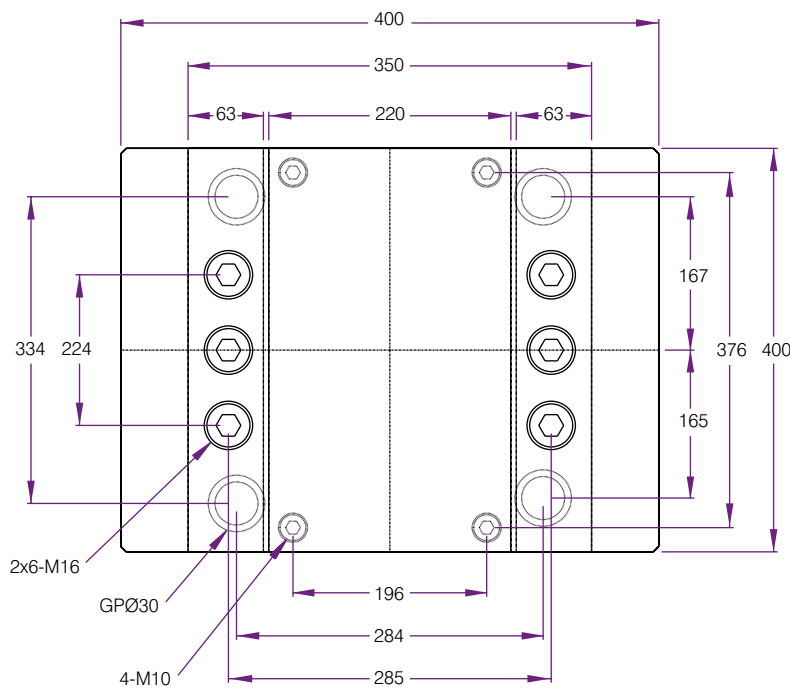
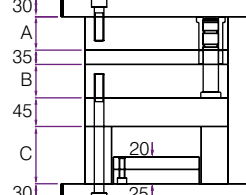
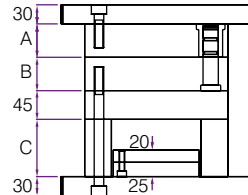
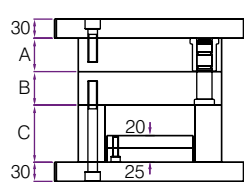
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A Type

B Type

C Type

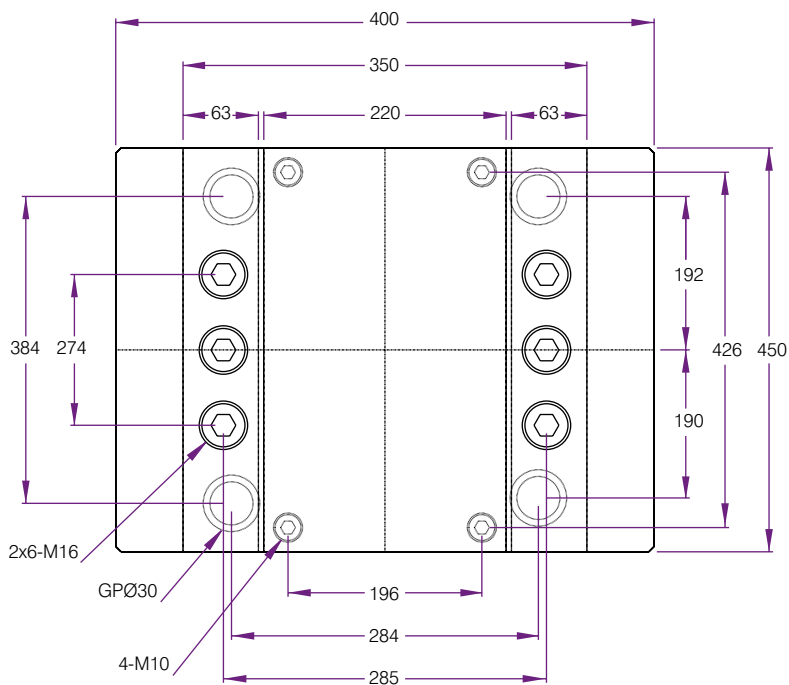
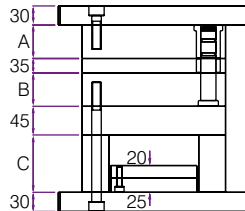
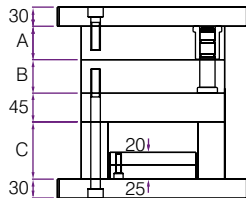
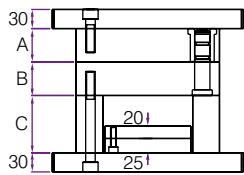


A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
40	40	100	
40	50	100	
40	60	100	
40	70	100	
40	80	100	
40	100	130	
50	40	100	
50	50	100	◆
50	60	100	◆
50	70	100	
50	80	100	
50	100	130	
60	40	100	
60	50	100	
60	60	100	◆
60	70	100	
60	80	100	
60	100	130	
70	40	100	
70	50	100	
70	60	100	
70	70	100	◆
70	80	100	
70	100	130	
80	40	100	
80	50	100	
80	60	100	
80	70	100	
80	80	100	◆
80	100	120	◆
100	40	100	
100	50	100	
100	60	100	
100	70	100	
100	80	100	
100	100	120	◆

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C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
40	40	80	◆
40	50	100	
40	60	100	
40	70	100	
40	80	100	
40	100	130	
50	40	100	
50	50	100	
50	60	100	◆
50	70	100	
50	80	100	
50	100	130	
60	40	100	
60	50	100	
60	60	100	
60	70	100	
60	80	100	
60	100	130	
70	40	100	
70	50	100	
70	60	100	
70	70	100	
70	80	100	
70	100	130	
80	40	100	
80	50	100	
80	60	100	
80	70	100	
80	80	100	◆
80	100	130	
100	40	100	
100	50	100	
100	60	100	
100	70	100	
100	80	100	
100	100	120	◆

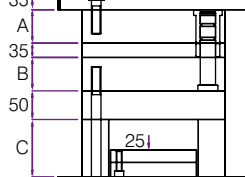
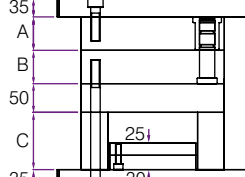
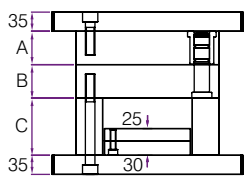
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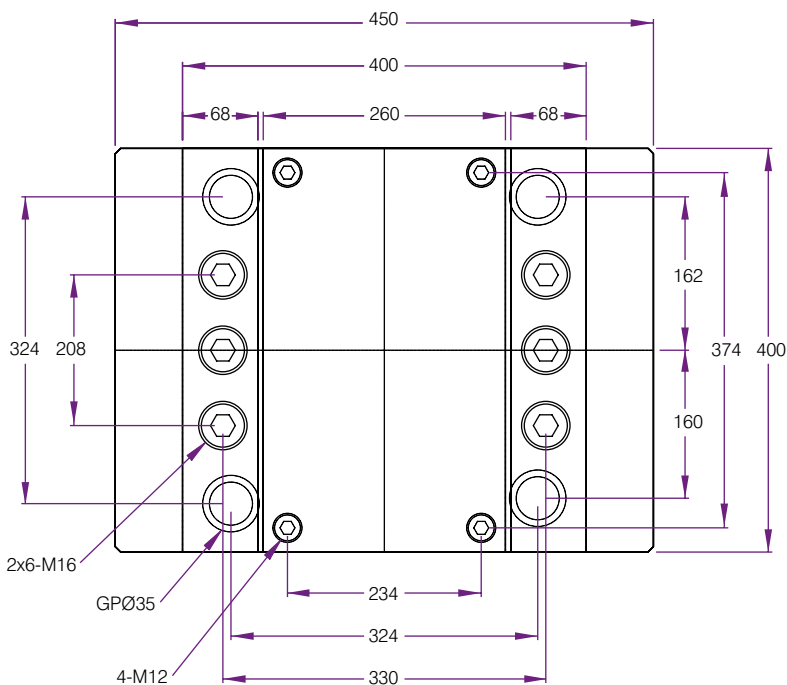
A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
40	40	120	
40	50	120	
40	60	120	
40	70	120	
40	80	120	
40	100	120	
50	40	120	
50	50	120	◆
50	60	120	
50	70	120	
50	80	120	
50	100	120	
60	40	120	
60	50	120	
60	60	120	◆
60	70	120	
60	80	120	
60	100	120	
70	40	120	
70	50	120	
70	60	120	
70	70	120	◆
70	80	120	
70	100	120	
80	40	120	
80	50	120	
80	60	120	
80	70	120	
80	80	120	◆
80	100	120	◆
90	90	120	◆
100	40	120	
100	50	120	
100	60	120	
100	70	120	
100	80	120	
100	100	120	◆



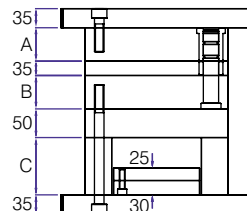
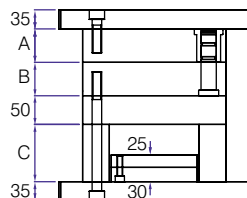
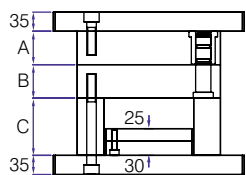
For safety reasons, some assembled mould bases now come with lifting holes.
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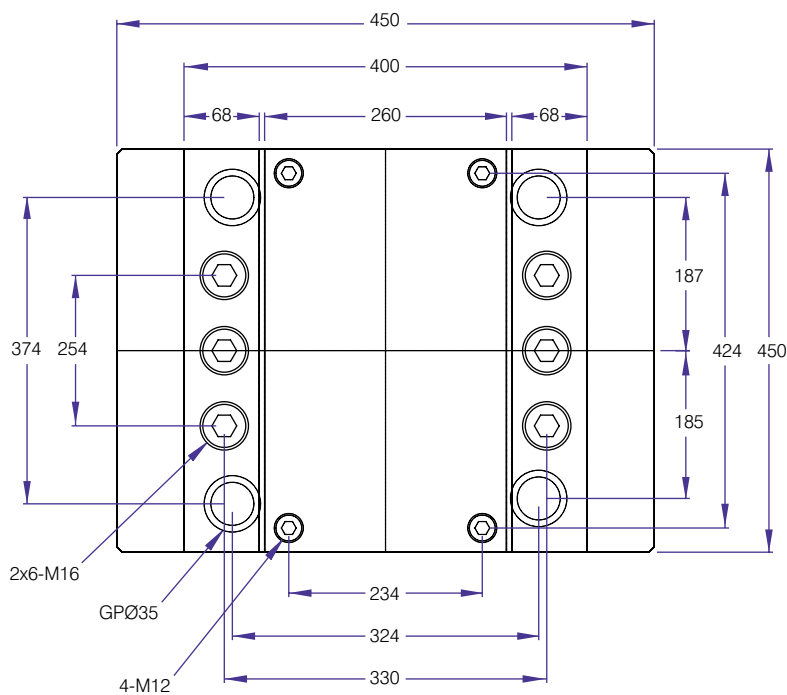
A Type

B Type

C Type



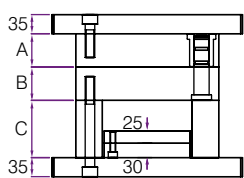
A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
40	40	120	
40	50	120	
40	60	120	
40	70	120	
40	80	120	
40	100	120	
50	40	120	
50	50	120	
50	60	120	
50	70	120	
50	80	120	
50	100	120	
60	40	120	
60	50	120	
60	60	120	
60	70	120	
60	80	120	
60	100	120	
70	40	120	
70	50	120	
70	60	120	
70	70	120	
70	80	120	
70	100	120	
80	40	120	
80	50	120	
80	60	120	
80	70	120	
80	80	120	
80	100	120	◆
100	40	120	
100	50	120	
100	60	120	
100	70	120	
100	80	120	
100	100	120	◆
100	120	140	
120	120	120	◆



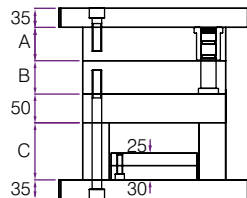
For safety reasons, some assembled mould bases now come with lifting holes.
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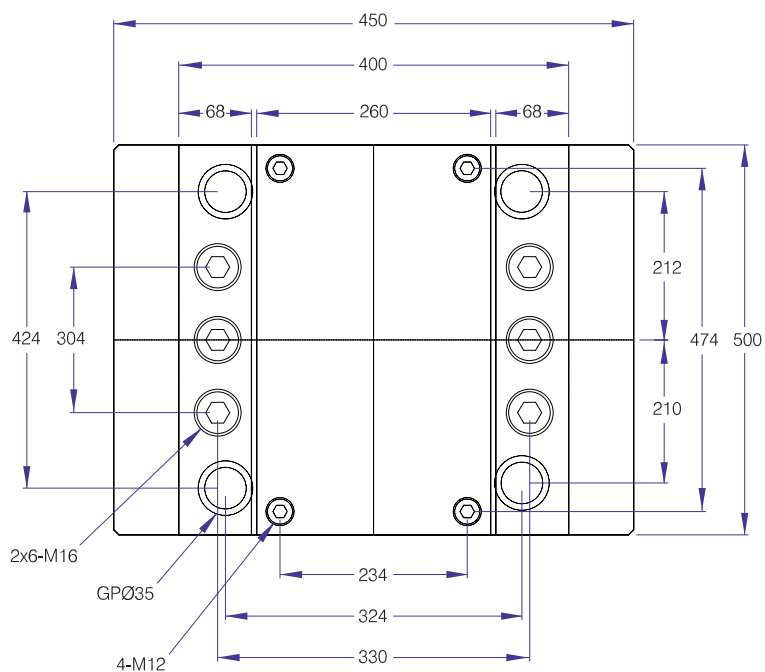
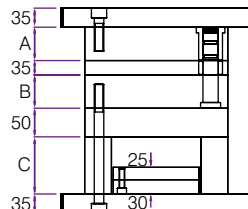
A Type



B Type



C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
40	40	120	
40	50	120	
40	60	120	
40	70	120	
40	80	120	
40	100	120	
50	40	120	
50	50	120	
50	60	120	
50	70	120	
50	80	120	
50	100	120	
60	40	120	
60	50	120	
60	60	120	
60	70	120	
60	80	120	
60	100	120	
70	40	120	
70	50	120	
70	60	120	
70	70	120	◆
70	80	120	
70	100	120	◆
80	40	120	
80	50	120	
80	60	120	
80	70	120	
80	80	120	◆
80	90	120	◆
100	40	120	
100	50	120	
100	60	120	
100	70	120	
100	80	120	
100	100	120	◆
100	120	140	◆
120	120	140	◆

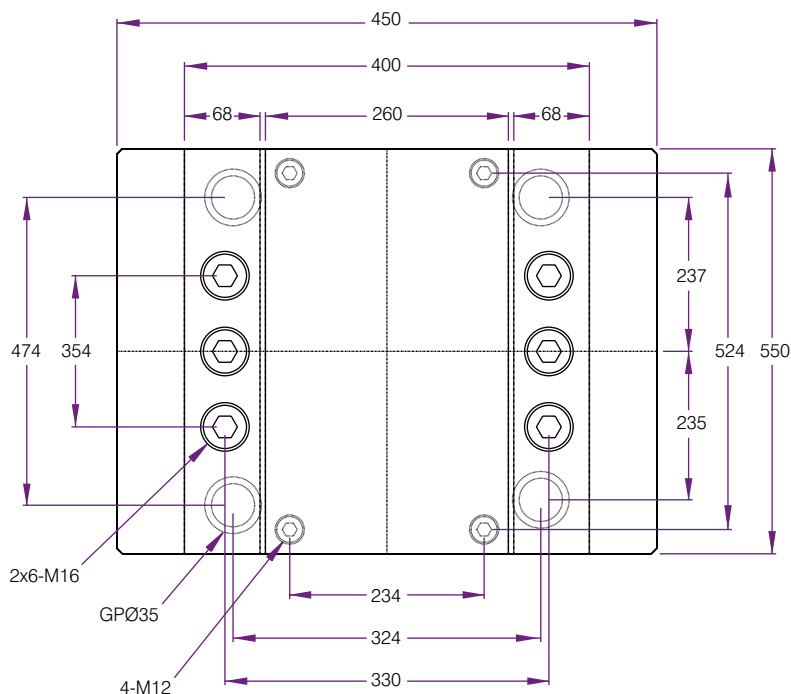
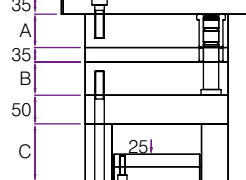
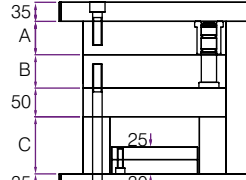
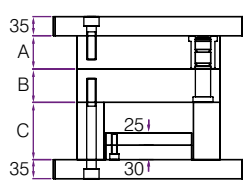
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A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
40	40	100	
40	50	100	
40	60	100	
40	70	100	
40	80	120	
40	100	120	
50	40	100	
50	50	100	
50	60	100	
50	70	100	
50	80	120	
50	100	120	
60	40	100	
60	50	100	◆
60	60	100	
60	70	100	
60	80	120	
60	100	120	
70	40	100	
70	50	100	
70	60	100	
70	70	100	
70	80	120	
70	100	120	
80	40	100	
80	50	100	
80	60	100	
80	70	100	
80	80	120	◆
80	100	120	
100	40	100	
100	50	100	
100	60	100	
100	70	100	
100	80	120	
100	100	120	

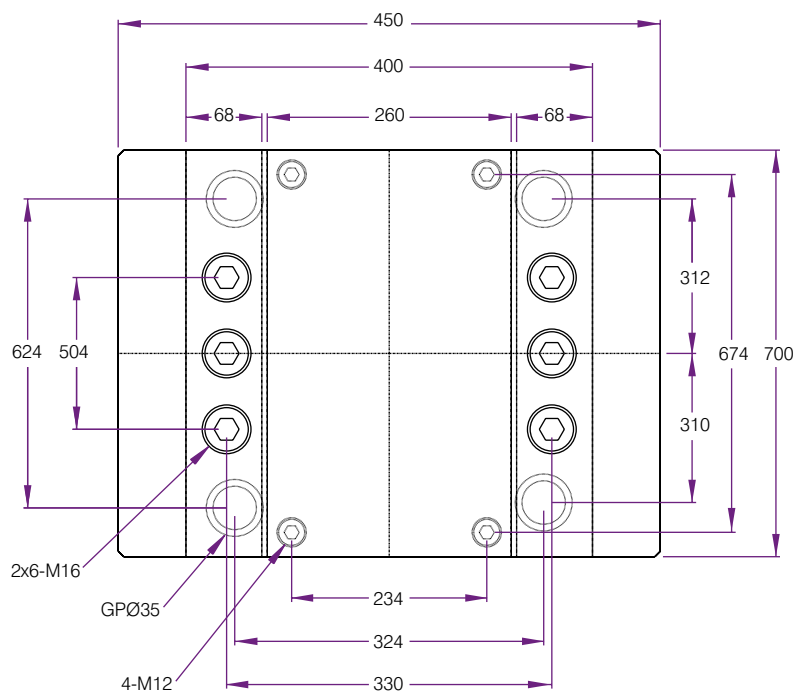
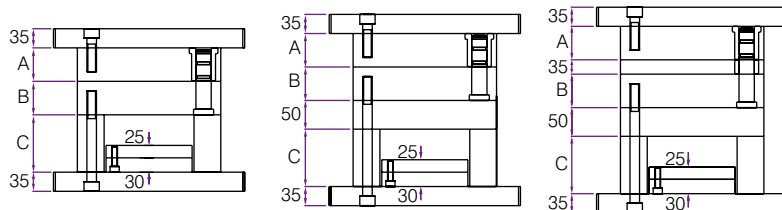
For safety reasons, some assembled mould bases now come with lifting holes.
Please enquire with your sales person before confirming your order.



A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
40	40	120	
40	50	120	
40	60	120	
40	70	120	
40	80	120	
40	100	120	
50	40	120	
50	50	120	
50	60	120	
50	70	120	
50	80	120	
50	100	120	
60	40	120	
60	50	120	
60	60	80	
60	70	120	
60	80	120	
60	100	120	
70	40	120	
70	50	120	
70	60	120	
70	70	120	
70	80	120	
70	100	120	
80	40	120	
80	50	120	
80	60	120	
80	70	120	
80	80	120	◆
80	100	120	
100	40	120	
100	50	120	
100	60	120	
100	70	120	
100	80	120	
100	100	120	◆

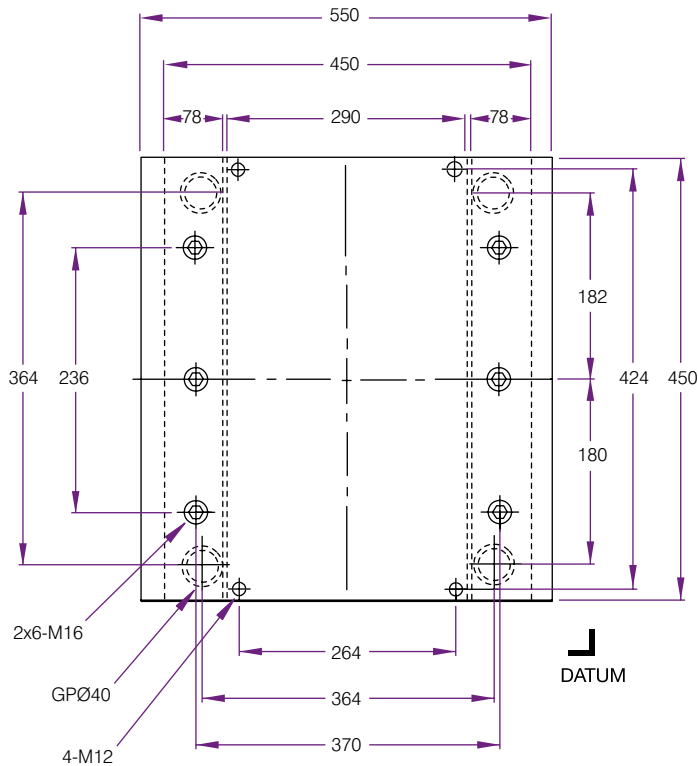
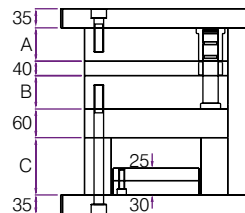
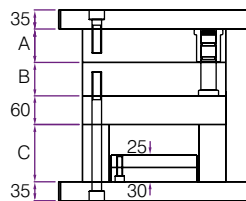
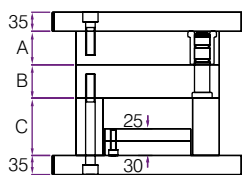
For safety reasons, some assembled mould bases now come with lifting holes.
Please enquire with your sales person before confirming your order.



A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
40	40	120	
40	50	120	
40	60	120	
40	70	120	
40	80	120	
40	100	120	
50	40	120	
50	50	120	
50	60	120	
50	70	120	
50	80	120	
50	100	120	
60	40	120	
60	50	120	
60	60	120	
60	70	120	
60	80	120	
60	100	120	
70	40	120	
70	50	120	
70	60	120	
70	70	120	◆
70	80	120	
70	100	120	
80	40	120	
80	50	120	
80	60	120	
80	70	120	
80	80	120	◆
80	100	120	
100	40	120	
100	50	120	
100	60	120	
100	70	120	
100	80	120	
100	100	120	◆
120	120	140	◆

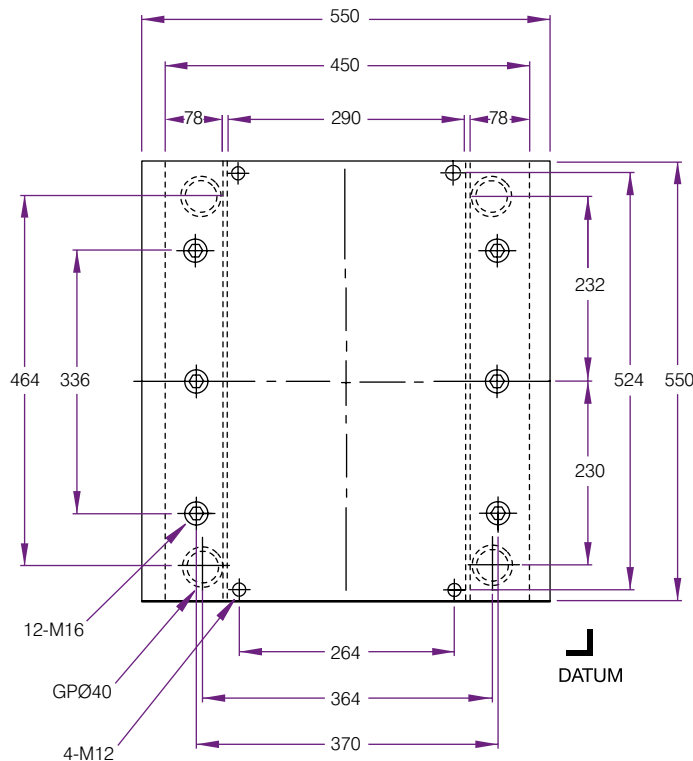
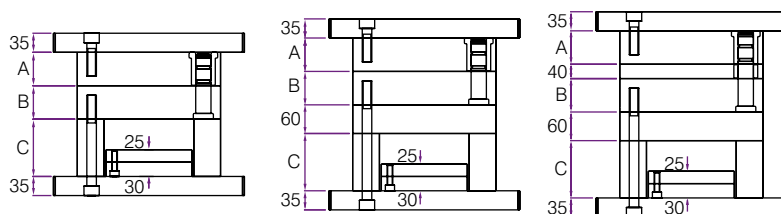
For safety reasons, some assembled mould bases now come with lifting holes.
Please enquire with your sales person before confirming your order.



A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
50	50	120	
50	60	120	
50	70	120	
50	80	120	
50	100	140	
60	50	120	
60	60	120	
60	70	120	
60	80	120	
60	100	140	
70	50	120	
70	60	120	
70	70	120	
70	80	120	
70	100	140	
80	50	120	
80	60	120	
80	70	120	
80	80	100	◆
80	100	140	
100	50	120	
100	60	120	
100	70	120	
100	80	120	
100	100	140	

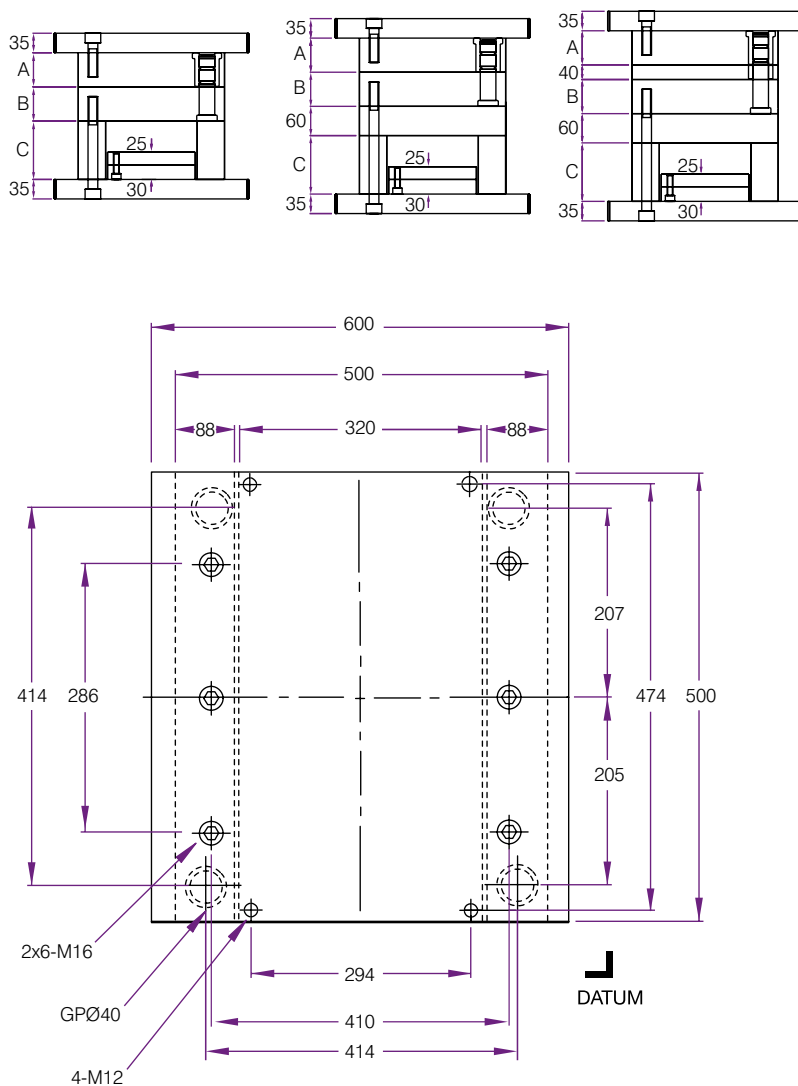
For safety reasons, some assembled mould bases now come with lifting holes.
Please enquire with your sales person before confirming your order.



A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
50	40	120	
50	50	120	
50	60	120	
50	70	120	
50	80	120	
50	100	140	
60	50	120	
60	60	120	
60	70	120	
60	80	120	
60	100	140	
70	50	120	
70	60	120	
70	70	120	
70	80	120	
70	100	140	
80	50	120	
80	60	120	
80	70	120	
80	80	120	◆
80	100	140	
100	50	120	
100	60	120	
100	70	120	
100	80	120	
100	100	140	◆
120	120	140	◆

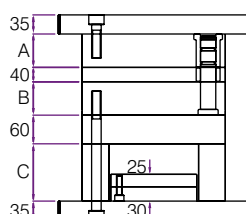
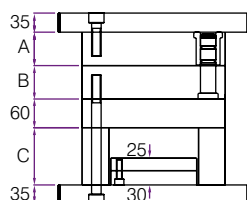
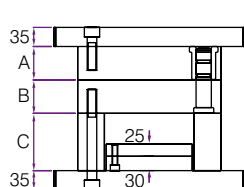
For safety reasons, some assembled mould bases now come with lifting holes.
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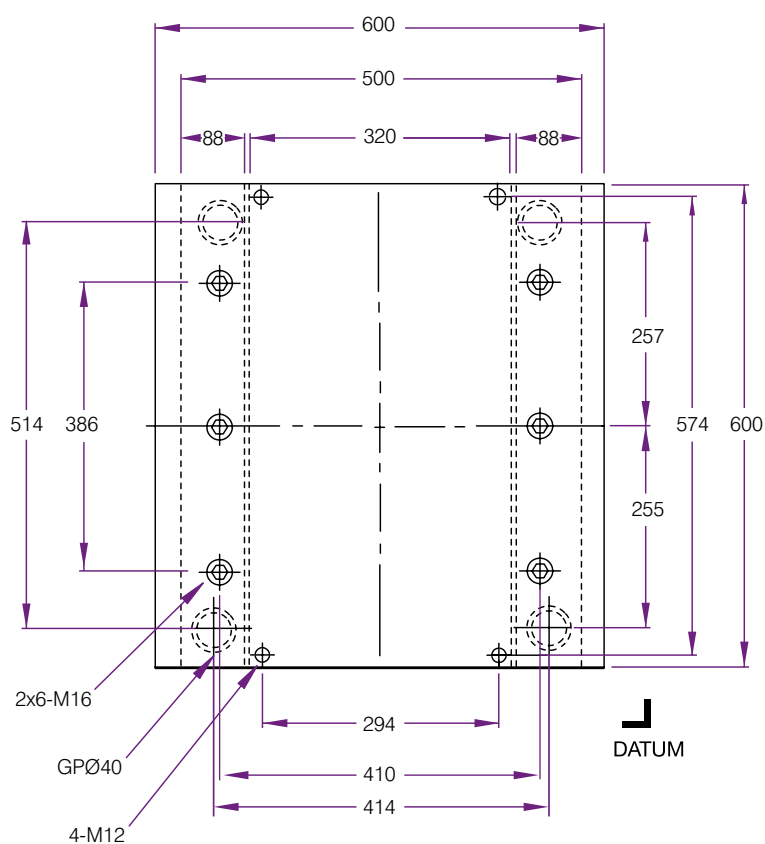
A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
50	50	120	
50	60	120	
50	70	120	
50	80	120	
50	100	140	
60	50	120	
60	60	120	
60	70	120	
60	80	120	
60	100	140	
70	50	120	
70	60	120	
70	70	120	
70	80	120	
70	100	140	
80	50	120	
80	60	120	
80	70	120	
80	80	120	◆
80	100	140	
100	50	120	
100	60	120	
100	70	120	
100	80	120	
100	100	140	◆
120	120	140	◆



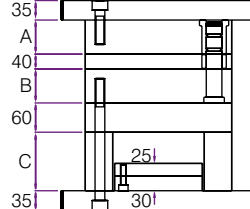
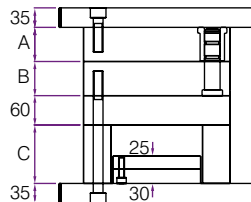
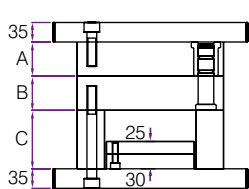
For safety reasons, some assembled mould bases now come with lifting holes.
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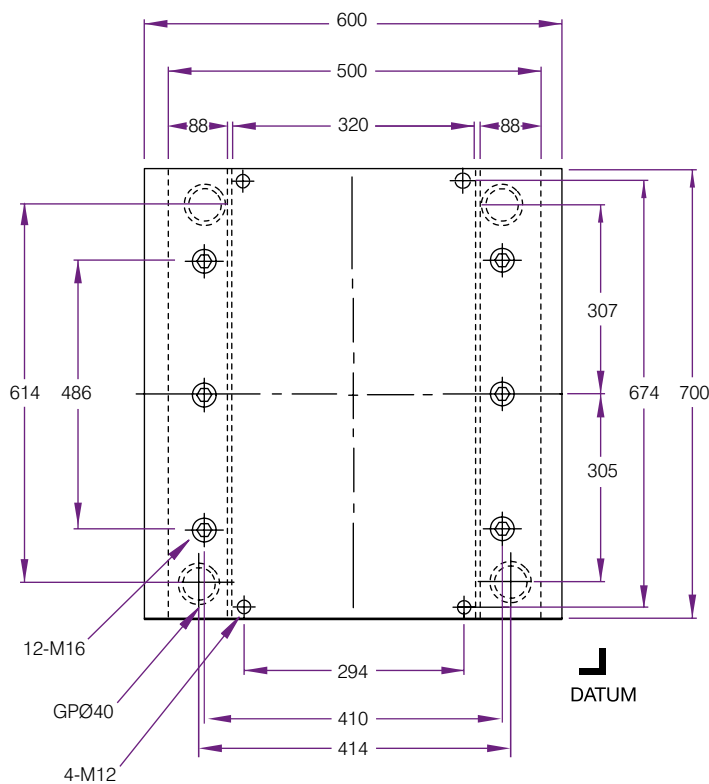
A Type

B Type

C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
50	50	120	
50	60	120	
50	70	120	
50	80	120	
50	100	140	
60	50	120	
60	60	120	
60	70	120	
60	80	120	
60	100	140	
70	50	120	
70	60	120	
70	70	120	
70	80	120	
70	100	140	
80	50	120	
80	60	120	
80	70	120	
80	80	120	
80	100	140	
100	50	120	
100	60	120	
100	70	120	
100	80	120	
100	100	140	
120	120	140	◆



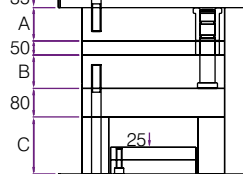
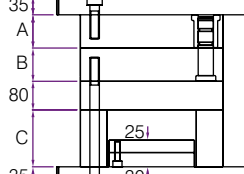
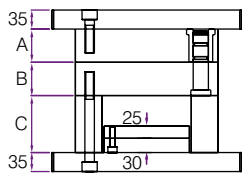
For safety reasons, some assembled mould bases now come with lifting holes.
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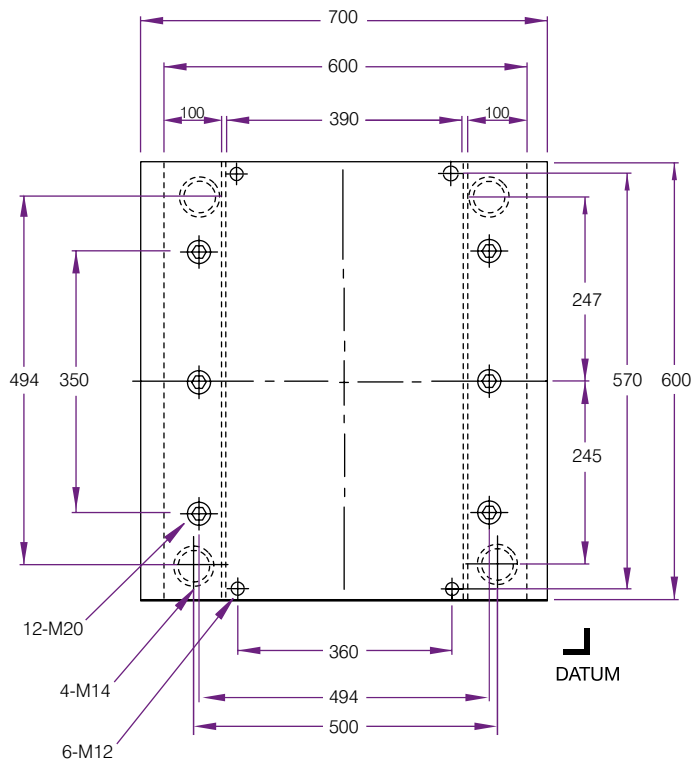
A Type

B Type

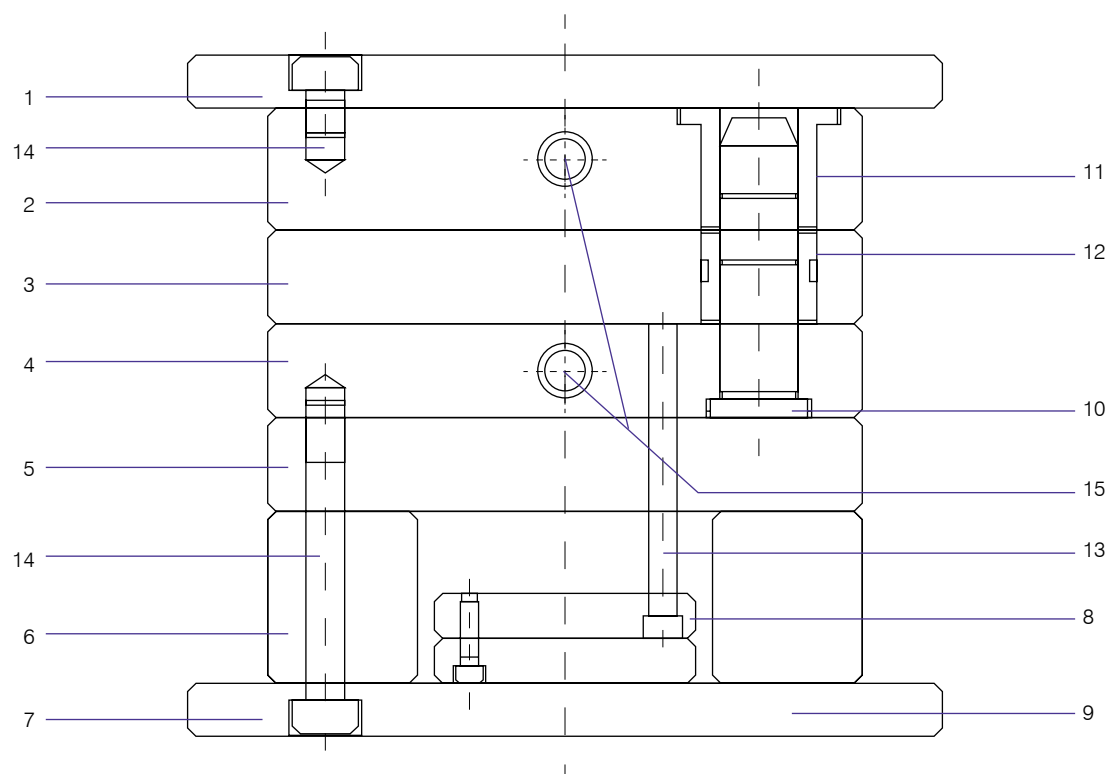
C Type



A	B	C	Stock Line
Fixed Plate	Moving Plate	Spacer Block	
50	50	120	
50	60	120	
50	70	120	
50	80	120	
50	100	140	
60	50	120	
60	60	120	
60	70	120	
60	80	120	
60	100	140	
70	50	120	
70	60	120	
70	70	120	
70	80	120	
70	100	140	
80	50	120	
80	60	120	
80	70	120	
80	80	120	
80	100	140	
100	50	120	
100	60	120	
100	70	120	
100	80	120	
100	100	140	
120	120	140	◆



For safety reasons, some assembled mould bases now come with lifting holes.
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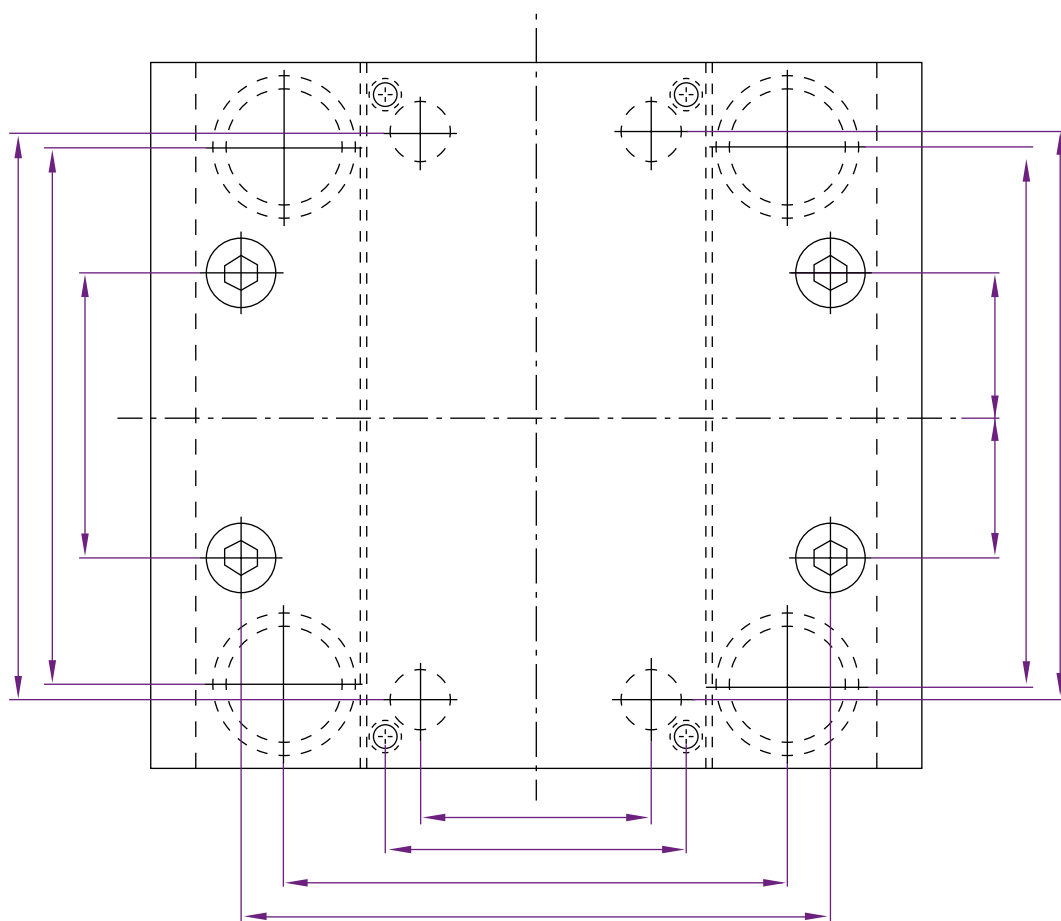


-- If you require a machined mould base, please send CAD file --

Item No.	Description	Material JIS	Size Width x Length x Height or Diameter
1	Top Clamping Plate		
2	Cavity Plate (A)		
3	Stripper Plate		
4	Core Plate (B)		
5	Support Plate (SO)		
6	Rails		
7	Bottom Clamping Plate		
8	Ejector Retainer Plate (A)		
9	Ejector Plate (B)		
10	Guide Pin		
11	Guide Bush (A)		
12	Guide Bush (B)		
13	Return Pin		
14	Socket Head Cap Screw		
15	Lifting Hole		

For safety reasons, some assembled mould bases now come with lifting holes.
Please enquire with your sales person before confirming order.

Special Requests



Pockets, waterways and special machining available.

For safety reasons, some assembled mould bases now come with lifting holes.
Please enquire with your sales person before confirming your order.



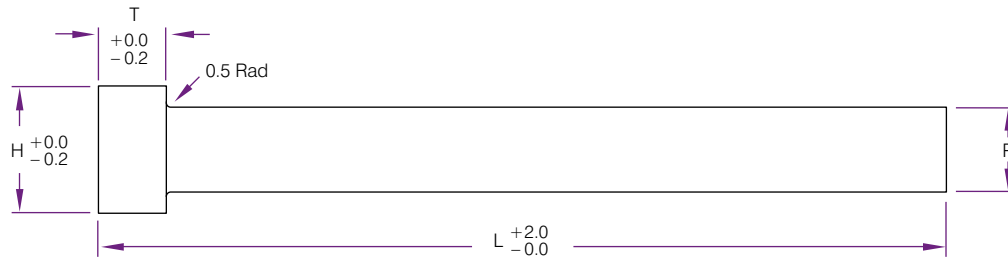
Material: H13

Hardness:

Core = 40-44RC

Surface = 70-72RC

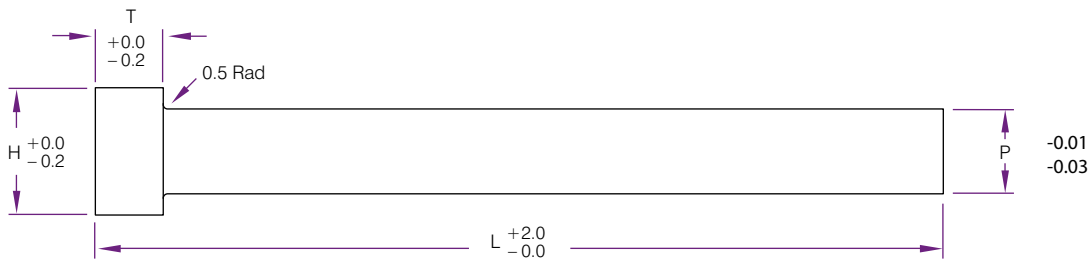
D	S	Product Code			
		L100	L 125	L150	L 250
1.0	10		NEJ01125-10		
1.0	12	NEJ01100-12		NEJ01150-12	
1.0	25	NEJ01100-25		NEJ01150-25	
1.0	50	NEJ01100-50		NEJ01150-50	NEJ01250-50
1.2	10		NEJ012125-10		
1.2	12				
1.2	25	NEJ012100-25		NEJ012150-25	
1.2	50			NEJ012150-50	NEJ012250-50
1.5	10		NEJ015125-10		
1.5	12	NEJ015100-12		NEJ015150-12	
1.5	25	NEJ015100-25		NEJ015150-25	
1.5	50			NEJ015150-50	NEJ015250-50
2.0	10		NEJ02125-10		
2.0	12	NEJ02100-12		NEJ02150-12	
2.0	25	NEJ02100-25		NEJ02150-25	
2.0	50			NEJ02150-50	NEJ02250-50
2.5	10		NEJ025125-10		
2.5	12	NEJ025100-12			
2.5	25	NEJ025100-25		NEJ025150-25	
2.5	50			NEJ025150-50	NEJ025250-50



Material: H13
 Hardness:
 Core = 40-45RC
 Surface = 70-72RC
 Special sizes to order.

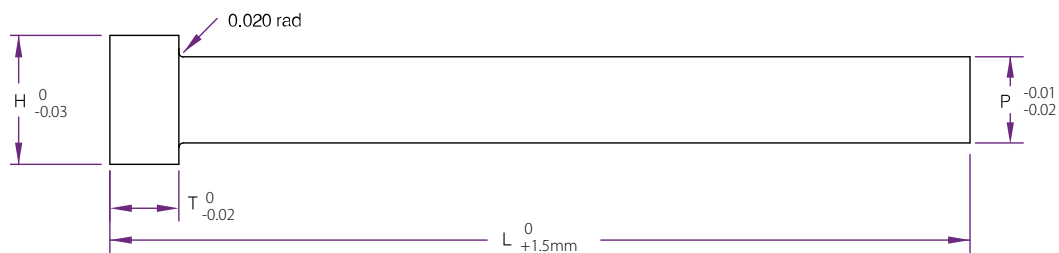
P Tolerance	
1-12	-0.01 / -0.02
14-25	-0.01 / -0.03

P	H	T	Product Code										
			L 100	L 150	L 200	L 250	L 300	L 350	L 400	L 450	L 650	L 800	L1000
1.0	6	4	NEJ01100	NEJ01150									
1.2	6			NEJ012150									
1.5	6	4	NEJ015100	NEJ015150		NEJ015250							
2.0	6	4	NEJ02100	NEJ02150		NEJ02250							
2.5	6	4	NEJ025100	NEJ025150	NEJ025200	NEJ025250							
3.0	6	4	NEJ03100	NEJ03150	NEJ03200	NEJ03250	NEJ03300	NEJ03350	NEJ03400	NEJ03400			
3.5	7	4	NEJ035100	NEJ035150	NEJ035200	NEJ03250							
4.0	8	6	NEJ04100	NEJ04150	NEJ04200	NEJ04250	NEJ04300	NEJ04350	NEJ04400	NEJ04450			
4.5	8	6		NEJ045150		NEJ045250							
5.0	9	6	NEJ05100	NEJ05150	NEJ05200	NEJ05250	NEJ05300	NEJ05350	NEJ05400	NEJ05450			
5.5	10	6		NEJ055150		NEJ055250							
6.0	10	6	NEJ06100	NEJ06150	NEJ06200	NEJ06250	NEJ06300	NEJ06350	NEJ06400	NEJ06450	NEJ06650	NEJ08800	
6.5	10	6	NEJ065100	NEJ065150		NEJ065250	NEJ065300		NEJ065400				
7.0	11	6	NEJ07100	NEJ07150	NEJ07200	NEJ07250	NEJ07300	NEJ07350	NEJ07400	NEJ07450	NEJ07650		
7.5	13	8			NEJ075200								
8.0	13	8	NEJ08100	NEJ08150	NEJ08200	NEJ08250	NEJ08300	NEJ08350	NEJ08400	NEJ08450	NEJ08650	NEJ08800	NEJ081000
8.5	14	8		NEJ085150			NEJ08300						
10.0	15	8	NEJ10100	NEJ10150	NEJ10200	NEJ10250	NEJ10300	NEJ10350	NEJ10400	NEJ10450	NEJ10650	NEJ10800	NEJ101000
12.0	17	8	NEJ12100	NEJ12150	NEJ12200	NEJ12250	NEJ12300	NEJ12350	NEJ12400	NEJ12450	NEJ12650	NEJ10800	NEJ121000
14.0	19	8	NEJ14100	NEJ14150		NEJ14250	NEJ14300	NEJ14350	NEJ14400	NEJ14450	NEJ14650		
15.0	20	8	NEJ15100	NEJ15150		NEJ15250				NEJ15450			
16.0	21	8	NEJ16100	NEJ16150	NEJ16200	NEJ16250	NEJ16300	NEJ16350	NEJ16400	NEJ16450	NEJ16650	NEJ16800	NEJ161000
18.0	23	8	NEJ18100	NEJ18150		NEJ18250		NEJ18350		NEJ18450	NEJ18650		
20.0	25	8		NEJ20150		NEJ20250		NEJ20350		NEJ20450	NEJ20650	NEJ20800	NEJ201000
25.0	30	8		NEJ205150		NEJ25250		NEJ25350		NEJ25450	NEJ25650	NEJ25800	



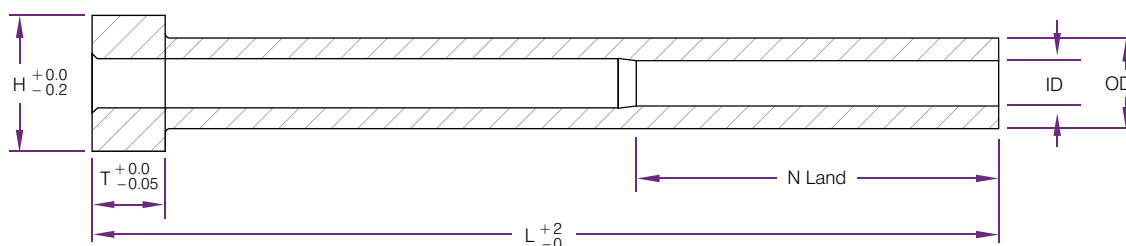
Material: H13
Hardness:
Core = 40-45RC
Surface = 70-72RC

P PD	H HD	T HT	Product Code	
			L150	L 250
2.1	6	4	NEJ021150	
3.1	7	4		NEJ031250
4.1	8	6	NEJ041150	NEJ041250
5.1	8	6		NEJ051250
6.1	10	6		NEJ061250
8.1	13	8		NEJ081250
10.1	15	8		NEJ101250



Material: H13
Hardness:
Core = 40-45RC

P	H	T	Product Code	
			150	250
3	6	4	SEJ03150	SEJ03250
4	8	6	SEJ04150	SEJ04250
5	9	6	SEJ05150	SEJ05250
6	10	6	SEJ06150	SEJ06250
7	11	6	SEJ07150	SEJ07250
8	13	8	SEJ08150	SEJ08250
10	15	8	SEJ10150	SEJ10250
12	17	8	SEJ12150	SEJ12250
14	19	8		SEJ14250
15	20	8	SEJ15150	SEJ15250
16	21	8		SEJ16250
18	23	8		SEJ18250
20	25	8		SEJ20250

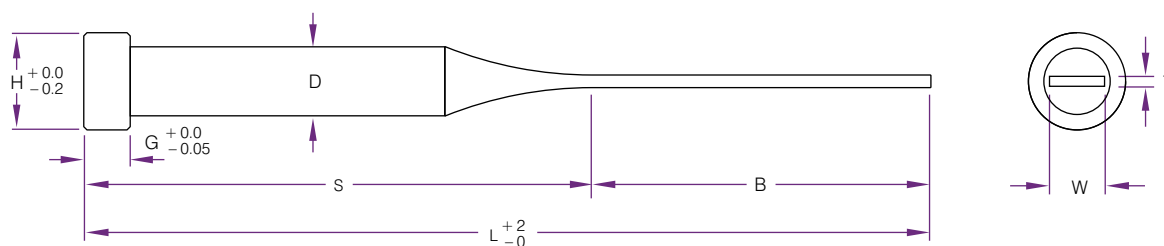


Material: H13
 Hardness:
 ID = 40RC
 Surface = 70RC
 Special sizes to order.

Tolerances

ID 1.5-3mm	-0 +.010	OD 4-5mm	-.010 -.020
ID 3.5-5mm	+0 +.012	OD 6-8mm	-.015 -.025
ID 5.5-10mm	+0 +.015	OD 10-15mm	-.020 -.030

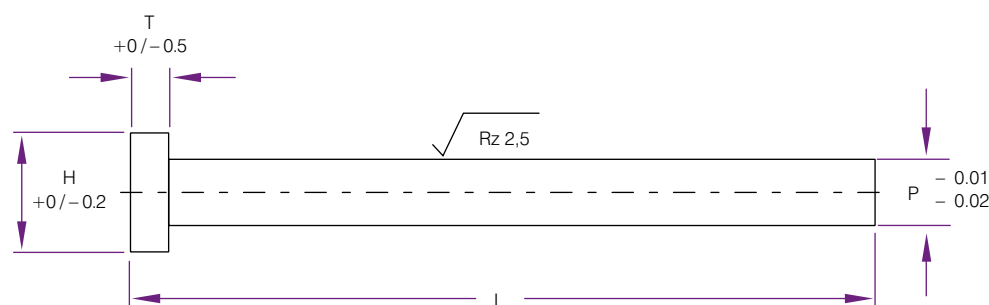
ID	OD	H	T	Product Code									L325	L350
				L 100	L 125	L 150	L 175	L 200	L 225	L 250	L 275	L 300		
				N=40		N=50		N=60		N=70				
2.0	4	8	6	MS204100	MS204125	MS204150								
2.0	5	9	6	MS205100	MS205125	MS205150	MS205175	MS205200						
2.0	6	10	6	MS206100	MS206125	MS206150	MS206175	MS206200						
2.5	5	9	6	MS2505100	MS2505125	MS2505150	MS2505175	MS2505200	MS2505225					
2.5	6	10	6	MS2506100	MS2506125	MS2506150	MS2506175	MS2506200	MS2506225	MS2506250				
3.0	5	9	6	MS305100	MS305125	MS305150	MS305175	MS305200						
3.0	6	10	6	MS306100	MS306125	MS306150	MS306175	MS306200	MS306225	MS306200				
3.0	7	11	6	MS307100	MS307125	MS307150	MS307175	MS307200	MS307225	MS307250	MS307275			
3.5	6	10	6	MS3506100	MS3506125	MS3506150	MS3506175	MS3506200	MS3506225	MS3506250				
3.5	7	11	6	MS3507100	MS3507125	MS3507150	MS3507175	MS3507200	MS3507225	MS3507250		MS3507325		
4.0	6	10	6	MS406100	MS406125	MS406150	MS406175	MS406200						
4.0	7	11	6	MS407100	MS407125	MS407150	MS407175	MS407200	MS407225	MS407250	MS407275	MS407300		
4.0	8	13	8	MS408100	MS408125	MS408150	MS408175	MS408200	MS408225	MS408250	MS408275	MS408300		
4.5	7	11	6	MS4507100	MS4507125	MS4507150	MS4507175	MS4507200	MS4507225	MS4507250				
4.5	8	13	8	MS4508100	MS4508125	MS4508150	MS4508175	MS4508200	MS4508225	MS4508250				
5.0	8	13	8	MS508100	MS508125	MS508150	MS508175	MS508200	MS508225	MS508250	MS508275	MS508300	MS508325	MS508350
5.0	10	15	8	MS510100	MS510125	MS510150	MS510175	MS510200						
5.5	8	13	8	MS5508100	MS5508125	MS5508150								
6.0	10	15	8	MS610100	MS610125	MS610150	MS610175	MS610200	MS610225	MS610250	MS610275	MS610300		MS610350
6.5	10	15	8	MS6510100	MS6510125	MS6510150	MS6510175	MS6510200	MS6510225	MS6510250				
6.5	12	17	8	MS6512100		MS6512150		MS6512200		MS6512250				
8.0	12	17	8	MS812100	MS812125	MS812150	MS812175	MS812200	MS812225	MS812250	MS812275	MS812300		MS812350
10	15	20	8	MS1015100	MS1015125	MS1015150		MS1015200		MS1015250				



Material: H13
Special sizes to Order
Please fill in Special Order Form

Product Code	T	W	D	L	S	B	G	H
MEB14100	1	4	5	100	40	60	6	9
MEB14125	1	4	5	125	50	75	6	9
MEB14150	1	4	5	150	60	90	6	9
MEB14175	1	4	5	175	70	105	6	9
MEB14200	1	4	5	200	80	120	6	9
MEB125125	1.2	5	6	125	50	75	6	10
MEB125150	1.2	5	6	150	60	90	6	10
MEB125175	1.2	5	6	175	70	105	6	10
MEB125200	1.2	5	6	200	80	120	6	10
MEB126125	1.2	6	7	125	50	75	6	11
MEB126150	1.2	6	7	150	60	90	6	11
MEB126175	1.2	6	7	175	70	105	6	11
MEB126200	1.2	6	7	200	80	120	6	11
MEB128125	1.2	8	10	125	50	75	8	15
MEB128150	1.2	8	10	150	60	90	8	15
MEB128175	1.2	8	10	175	70	105	8	15
MEB128200	1.2	8	10	200	80	120	8	15
MEB155125	1.5	5	6	125	50	75	6	10
MEB155150	1.5	5	6	150	60	90	6	10
MEB155175	1.5	5	6	175	70	105	6	10
MEB155200	1.5	5	6	200	80	170	6	10

Product Code	T	W	D	L	S	B	G	H
MEB156125	1.5	6	7	125	50	75	6	11
MEB156150	1.5	6	7	150	60	90	6	11
MEB156175	1.5	6	7	175	70	105	6	11
MEB156200	1.5	6	7	200	80	120	6	11
MEB158125	1.5	8	10	125	50	75	8	15
MEB158150	1.5	8	10	150	60	90	8	15
MEB158175	1.5	8	10	175	70	105	8	15
MEB158200	1.5	8	10	200	80	120	8	15
MEB26100	2	6	7	100	40	60	6	11
MEB26125	2	6	7	125	50	75	6	11
MEB26150	2	6	7	150	60	90	6	11
MEB26200	2	6	7	200	80	120	6	11
MEB28100	2	8	10	100	40	60	8	15
MEB28125	2	8	10	125	50	75	8	15
MEB28150	2	8	10	150	60	90	8	15
MEB28175	2	8	10	175	70	105	8	15
MEB28200	2	8	10	200	80	120	8	15
MEB210125	2	10	12	125	50	75	8	17
MEB210150	2	10	12	150	60	90	8	17
MEB210175	2	10	12	175	70	105	8	17
MEB210200	2	10	12	200	80	120	8	17



Hardness:

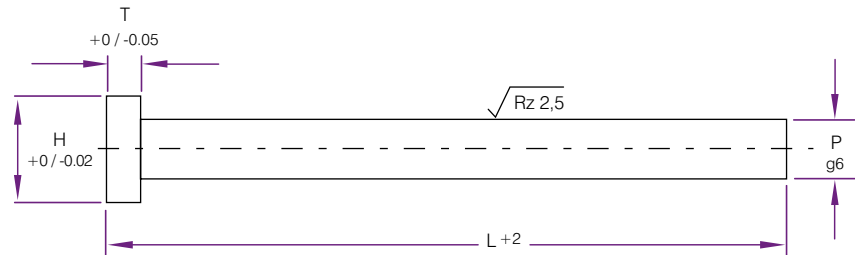
Head = HRC45+/- 5

Shaft = HRC60+/-2 Through Hardened

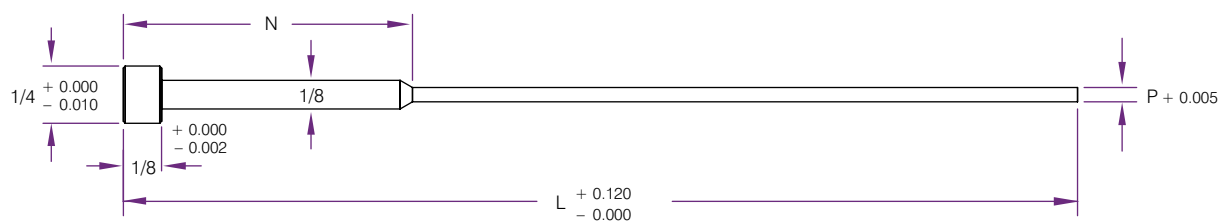
P	H	T	Product Code										
			L 100	L 150	L 200	L 250	L 300	L 350	L 400	L 500	L 600	L 700	L 800
1.0	6	4	HEJ010100	HEJ010150	HEJ010200	HEJ010250	HEJ010300						
1.5	6	4	HEJ015100	HEJ015150	HEJ015200	HEJ015250	HEJ015300						
2.0	6	4	HEJ020100	HEJ020150	HEJ020200	HEJ020250	HEJ020300	HEJ020350					
2.5	6	4	HEJ025100	HEJ025150	HEJ025200	HEJ025250	HEJ025300	HEJ025350					
3.0	6	4	HEJ030100	HEJ030150	HEJ030200	HEJ030250	HEJ030300	HEJ030350	HEJ030400				
3.5	7	4	HEJ035100	HEJ035150	HEJ035200	HEJ035250	HEJ035300	HEJ035350					
4.0	8	6	HEJ040100	HEJ040150	HEJ040200	HEJ040250	HEJ040300	HEJ040350					
4.5	9	6	HEJ045100	HEJ045150	HEJ045200	HEJ045250	HEJ045300	HEJ045350					
5.0	9	6	HEJ50100	HEJ50150	HEJ50200	HEJ50250	HEJ50300	HEJ50350	HEJ50400				
5.5	10	6	HEJ55100	HEJ55150	HEJ55200	HEJ55250	HEJ55300	HEJ55350	HEJ55400				
6.0	10	6	HEJ60100	HEJ60150	HEJ60200	HEJ60250	HEJ60300	HEJ60350	HEJ60400	HEJ60500			
6.5	11	6	HEJ65100	HEJ65150	HEJ65200	HEJ65250	HEJ65300	HEJ65350	HEJ65400	HEJ65500			
7.0	11	6	HEJ70100	HEJ70150	HEJ70200	HEJ70250	HEJ70300	HEJ70350	HEJ70400	HEJ70500			
7.5	13	8	HEJ75100	HEJ75150	HEJ75200	HEJ75250	HEJ75300	HEJ75350	HEJ75400	HEJ75500			
8.0	13	8	HEJ80100	HEJ80150	HEJ80200	HEJ80250	HEJ80300	HEJ80350	HEJ80400	HEJ80500	HEJ80600		
8.5	14	8	HEJ85100	HEJ85150	HEJ85200	HEJ85250	HEJ85300	HEJ85350	HEJ85400	HEJ85500	HEJ85600		
9.0	14	8	HEJ90100	HEJ90150	HEJ90200	HEJ90250	HEJ90300	HEJ90350	HEJ90400	HEJ90500	HEJ90600		
10.0	15	8	HEJ100100	HEJ100150	HEJ100200	HEJ100250	HEJ100300	HEJ100350	HEJ100400	HEJ100500	HEJ100600	HEJ100700	HEJ100800
10.5	15	8		HEJ105150	HEJ105200	HEJ105250	HEJ105300						
11.0	17	8		HEJ110150	HEJ110200	HEJ110250	HEJ110300						
12.0	17	8	HEJ120100	HEJ120150	HEJ120200	HEJ120250	HEJ120300	HEJ120350	HEJ120400	HEJ120500	HEJ120600	HEJ120700	HEJ120800
12.5	18	8	HEJ125100	HEJ125150	HEJ125200	HEJ125250							
13.0	18	8	HEJ130125	HEJ130150		HEJ130250							
14.0	19	8	HEJ140100	HEJ140150	HEJ140200	HEJ140250	HEJ140300	HEJ140350	HEJ140400	HEJ140500	HEJ140600	HEJ140700	HEJ140800
15.0	20	8	HEJ150100			HEJ150250	HEJ150300						
16.0	21	8	HEJ160100	HEJ160150	HEJ160200	HEJ160250	HEJ160300	HEJ160350	HEJ160400	HEJ160500	HEJ160600	HEJ160700	HEJ160800
20.0	25	8	HEJ200100	HEJ200150	HEJ200200	HEJ200250	HEJ200300	HEJ200350	HEJ200400	HEJ200500	HEJ200600	HEJ200700	HEJ200800
25.0	30	8	HEJ250100	HEJ250150	HEJ250200	HEJ250250	HEJ250300	HEJ250350	HEJ250400	HEJ250500	HEJ250600	HEJ250700	HEJ250800



Standard: DIN1530-AH / ISO6751
 Material: 1.2067 Hardened Steel
 Hardness:
 Head = HRC45+/-5
 Core = HRC60+/-2 Through Hardened



P	H	T	Product Code											
			L40	L60	L80	L 100	L 125	L 160	L 200	L 250	L 315	L 400	L 500	L630
1.0	2.5	1.2				HED010100		HED010160						
1.2	2.5	1.2				HED012100								
1.5	3	1.5	HED015040			HED015100	HED015125	HED15160	HED015200	HED015250				
1.6	3	1.5	HED016040	HED016060	HED016080	HED016100		HED16160						
2.0	4	2	HED020040	HED020060	HED020080	HED020100	HED020125	HED020160	HED020200	HED020250	HED020315			
2.2	4	2				HED022100	HED022125	HED022160	HED022200	HED022250	HED022315			
2.5	5	2				HED025100	HED025125	HED025160	HED025200	HED025250	HED025315			
2.7	5	2				HED027100	HED027125	HED027160	HED027200	HED027250	HED027315			
3.0	6	3				HED030100	HED030125	HED030160	HED030200	HED030250	HED030315	HED030400		
3.2	6	3				HED032100	HED032125	HED032160	HED032200	HED032250	HED032315	HED032400		
3.5	7	3				HED035100	HED035125	HED035160	HED035200	HED035250	HED035315	HED035400		
3.7	7	3				HED037100	HED037125	HED037160	HED037200	HED037250	HED037315	HED037400		
4.0	8	3		HED040060	HED040080	HED040100	HED040125	HED040160	HED040200	HED040250	HED040315	HED040400	HED040500	
4.2	8	3				HED042100	HED042125	HED042160	HED042200	HED042250	HED042 315	HED042400	HED042500	
4.5	8	3				HED045100	HED045125	HED045160	HED045200	HED045250	HED045315	HED045400	HED045500	
5.0	10	3			HED050080	HED050100	HED050125	HED050160	HED050200	HED050250	HED050315	HED050400	HED050500	
5.2	10	3				HED052100	HED052125	HED052160	HED052200	HED052250	HED052315	HED052400	HED052500	
5.5	10	3				HED055100	HED055125	HED055160	HED055200	HED055250	HED055315	HED055400	HED055500	
6.0	12	5	HED060040	HED060060		HED060100	HED060125	HED060160	HED060200	HED060250	HED060315	HED060400	HED060500	HED060630
6.2	12	5				HED062100	HED062125	HED062160	HED062200	HED062250	HED062315	HED062400	HED062500	HED062630
6.5	12	5				HED065100	HED065125	HED065160	HED065200	HED065250	HED065315	HED065400	HED065500	HED065630
7.0	12	5				HED070100	HED070125	HED070160	HED070200	HED070250	HED070315	HED070400	HED070500	HED070630
7.5	12	5				HED075100	HED075125	HED075160	HED075200	HED075250	HED075315	HED075400	HED075500	HED075630
8.0	14	5		HED080060		HED080100	HED080125	HED080160	HED080200	HED080250	HED080315	HED080400	HED080500	HED080630
8.2	14	5				HED082100	HED082125	HED082160	HED082200	HED082250	HED082315	HED082400	HED082500	HED082630
8.5	14	5				HED085100	HED085125	HED085160	HED085200	HED085250	HED085315	HED085400	HED085500	HED085630
9.0	14	5				HED090100	HED090125	HED090160	HED090200	HED090250	HED090315	HED090400	HED090500	HED090630
10.0	16	5				HED100100	HED100125	HED100160	HED100200	HED100250	HED100315	HED100400	HED100500	HED100630
10.2	16	5				HED102100	HED102125	HED102160	HED102200	HED102250	HED102315	HED102400	HED102500	HED102630
10.5	16	5				HED105100	HED105125	HED105160	HED105200	HED105250	HED105315	HED105400	HED105500	HED105630
11.0	16	5				HED110100	HED110125	HED110160	HED110200	HED110250	HED110315	HED110400	HED110500	HED110630
12.0	20	7				HED120100	HED120125	HED120160	HED120200	HED120250	HED120315	HED120400	HED120500	HED120630
12.2	20	7				HED122100	HED122125	HED122160	HED122200	HED122250	HED122315	HED122400	HED122500	HED122630
12.5	20	7				HED125100	HED125125	HED125160	HED125200	HED125250	HED125315	HED125400	HED125500	HED125630
13.0	20	7								HED130250				
14.0	22	7				HED14100	HED14125	HED14160	HED14200	HED14250	HED14315	HED14400	HED14500	HED14630
16.0	22	7				HED16100	HED16125	HED16160	HED16200	HED16250	HED16315	HED16400	HED16500	HED16630
18.0	24	7				HED18100	HED18125	HED18160	HED18200	HED18250	HED18315	HED18400	HED18500	HED18630
20.0	26	8				HED20100	HED20125	HED20160	HED20200	HED20250	HED20315	HED20400	HED20500	HED20630
25.0	32	10						HED25160	HED25200	HED25250	HED25315	HED25400	HED25500	HED25630
32.0	40	10						HED32160	HED32200	HED32250	HED32315	HED32400	HED32500	HED32630



Material: H13

Hardness:

Core = 40-45RC

Surface = 70-72RC

P	N	Product Code	
		L 6"	L 10"
3/64	1/2	E0306 - 1/2	E0310 - 1/2
1/16	1/2	E0406 - 1/2	E0310 - 1/2
5/64	1/2	E0506 - 1/2	E0310 - 1/2
3/32	1/2	E0606 - 1/2	E0310 - 1/2
7/64	1/2	E0706 - 1/2	E0310 - 1/2
3/64	1	E0306 - 1	
1/16	1	E0406 - 1	
5/64	1	E0506 - 1	
3/32	1	E0606 - 1	
7/64	1	E0706 - 1	
3/64	2	E0306 - 2	E0310 - 2
1/16	2	E0406 - 2	E0410 - 2
5/64	2	E0506 - 2	E0510 - 2
3/32	2	E0606 - 2	E0610 - 2
7/64	2	E0706 - 2	E0710 - 2



Material: H13

Hardness:

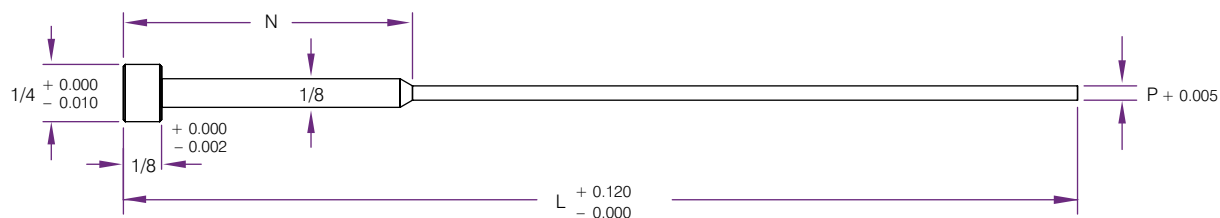
Core = 40-45RC

Surface = 70-72RC

P Tolerance

3/64-23/64	-0.0003	3/8-1"	+0.000
	-0.0008		-0.001

P	H	T	Product Code				
			L 6"	L 10"	L 14"	L 18"	L 25"
3/64	1/4	1/8	EO306				
1/16	1/4	1/8	EO406				
5/64	1/4	1/8	EO506				
3/32	1/4	1/8	EO606	EO610			
7/64	1/4	1/8	EO706	EO710			
1/8	1/4	1/8	EO806	EO810	EO814		
9/64	1/4	1/8		EO910	EO914		
5/32	9/32	5/32	E1006	E1010	E1014	E1018	
11/64	11/32	3/16		E1110	E1114		
3/16	3/8	3/16	E1206	E1210	E1214	E1218	E1225
13/64	3/8	3/16		E1310			
7/32	13/32	3/16		E1410	E1414		
1/4	7/16	3/16	E1606	E1610	E1614	E1618	E1625
17/64	7/16	1/4		E1710	E1714		E1725
9/32	7/16	1/4	E1806	E1810	E1814	E1818	E1825
19/64	1/2	1/4		E1910	E1914		
5/16	1/2	1/4	E2006	E2010	E2014	E2018	E2025
21/64	9/16	1/4		E2110	E2114		
11/32	9/16	1/4	E2206	E2210	E2214		E2225
23/64	5/8	1/4		E2310	E2314		
3/8	5/8	1/4	E2406	E2410	E2414	E2418	E2425
13/32	11/16	1/4	E2606	E2610	E2614	E2618	E2625
7/16	11/16	1/4	E2706	E2710	E2714	E2718	E2725
15/32	3/4	1/4		E3010	E3014	E3018	
1/2	3/4	1/4	E3206	E3210	E3214	E3218	E3225
9/16	13/16	1/4	E3606	E3610	E3614	E3618	
5/8	7/8	1/4	E4006	E4010	E4014	E4018	E4025
11/16	15/16	1/4		E4210			
3/4	1"	1/4	E4806	E4810	E4814	E4818	E4825
7/8	1 1/8"	1/4	E5606	E5610	E5614	E5618	
1"	1 1/4"	1/4	E6406	E6410	E6414	E6418	E6425



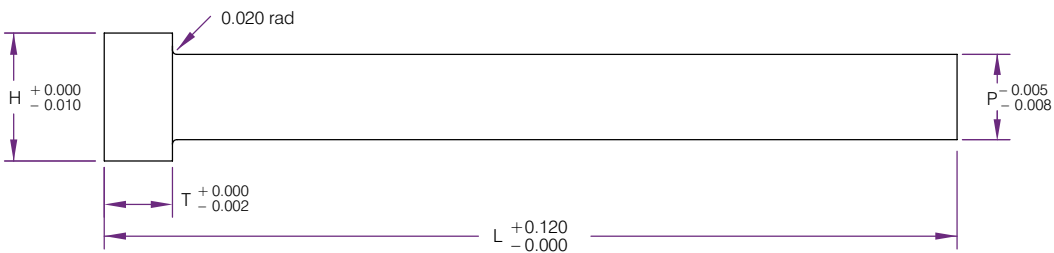
Material: H13
 Hardness:
 Core = 40-45RC
 Surface = 70-72RC

Product Code	P	N	L
EO310 - 1/2OS	3/64	1/2	10
EO310 - 2OS	3/64	2	10
EO510 - 1/2OS	5/64	1/2	10
EO510 - 2OS	5/64	2	10
EO610 - 1/2OS	3/32	1/2	10
EO610 - 2OS	3/32	2	10
EO710 - 2OS	7/64	2	10

Ejector Pins - Oversize Straight Imperial

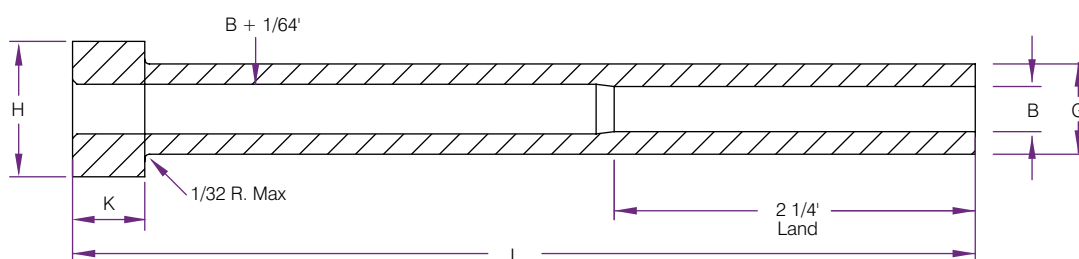


Product Code	P	H	T	L
EO810 - OS	1/8	1/4	1/8	10
E1010 - OS	5/32	9/32	5/32	10
E1210 - OS	3/16	3/8	3/16	10
E1610 - OS	1/4	7/16	3/16	10
E2010 - OS	5/16	1/2	1/4	10
EO810 - OS	1/8	5/8	1/4	10
E2810 - OS	7/16	11/16	1/4	10
E3210 - OS	1/2	3/4	1/4	10



Material: H13
Hardness: 40-45RC

P	H	T	Product Code		
			L 6"	L 10"	L 14"
1/8	1/4	1/8	ES0406	ES0410	
5/32	9/32	5/32	ES0506	ES0510	
3/16	3/8	3/16		ES1210	
7/32	13/32	3/16		ES1410	
1/4	7/16	3/16		ES1610	
9/32	7/16	1/4		ES1810	
5/16	1/2	1/4		ES2010	
3/8	5/8	1/4	ES2406	ES2410	ES2414
7/16	11/16	1/4	ES2806	ES2810	ES2814
1/2	3/4	1/4	ES3206	ES3210	ES3214
9/16	13/16	1/4	ES3606		
5/8	7/8	1/4	ES4006	ES4010	ES4014
3/4	1	1/4	ES4806	ES4810	ES4814



Material: H13

Hardness:

Core = 40-45RC

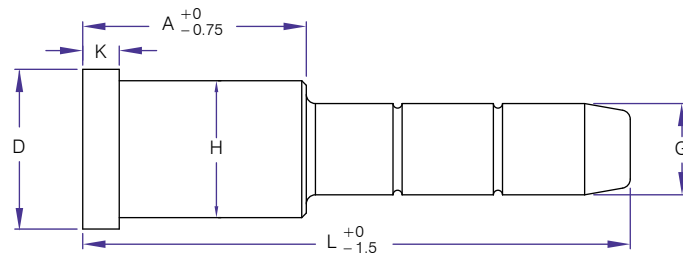
Surface = 70-72RC

ISO6 and ISO8 have a 1 3/4 land.

Tolerances

Head Diameter (H)	-.000 +.010
Head Thickness (K)	-.000 +.002
Sleeve Diameter (G)	-.000 +.001
Sleeve ID (B)	+.0005 -.0000
Length (L)	+.12 -.00

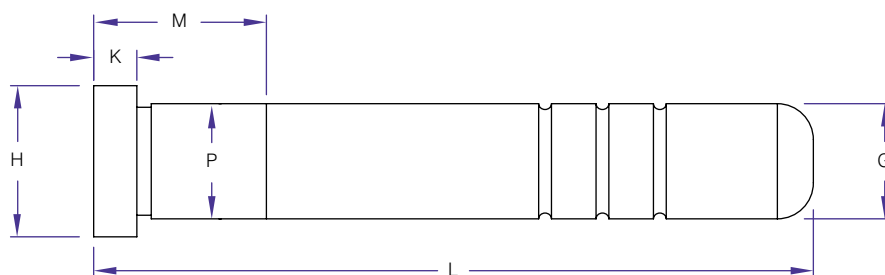
B ID	G OD	H O	K Head Thickness	Product Code									
				L 3"	L 4"	L 5"	L 6"	L 7"	L 8"	L 9"	L 10"	L 11"	L 12"
3/32	3/16	3/8	3/16	ISO603	ISO604	ISO605	ISO606	ISO607					
1/8	7/32	13/32	3/16	ISO803	ISO804	ISO805	ISO806	ISO807					
5/32	1/4	7/16	3/16		IS1004	IS1005	IS1006	IS1007	IS1008	IS1009	IS1010		
3/16	5/16	1/2	1/4		IS1204	IS1205	IS1206	IS1207	IS1208	IS1209	IS1210	IS1211	IS1212
7/32	11/32	9/16	1/4		IS1404	IS1405	IS1406	IS1407	IS1408	IS1409	IS1410		
1/4	3/8	5/8	1/4	IS1603	IS1604	IS1605	IS1606	IS1607	IS1608	IS1609	IS1610	IS1611	IS1612
5/16	7/16	11/16	1/4		IS2004	IS2005	IS2006	IS2007	IS2008	IS2009	IS2010	IS2011	IS2012
3/8	1/2	3/4	1/4		IS2404	IS2405	IS2406	IS2407	IS2408	IS2409	IS2410	IS2411	IS2412
7/16	5/8	7/8	1/4		IS2804	IS2805	IS2806	IS2807	IS2808	IS2809	IS2810	IS2811	IS2812
1/2	11/16	15/16	1/4		IS3204	IS3205	IS3206	IS3207	IS3208	IS3209	IS3210	IS3211	IS3212
9/16	3/4	1"	1/4		IS3604	IS3605	IS3606	IS3607	IS3608	IS3609	IS3610	IS3611	IS3612
5/8	7/8	1 1/8	1/4		IS4004	IS4005	IS4006	IS4007	IS4008	IS4009	IS4010	IS4011	IS4012
3/4	1"	1 1/4	1/4		IS4804	IS4805	IS4806	IS4807	IS4808	IS4809	IS4810	IS4811	IS4812



General Dimensions

G	H	D	K
16F7	25K6	30	6
20F7	30K6	35	8
25F7	35K6	40	8
30F7	42K7	47	10

Product Code	G	A	L	Product Code	G	A	L	Product Code	G	A	L	Product Code	G	A	L
MP162460	16	24	60	MP2044100	20	44	100	MP2544120	25	44	120	MP3044200	30	44	200
MP162480	16	24	80	MP2044120	20	44	120	MP2544140	25	44	140	MP3049120	30	49	120
MP1624100	16	24	100	MP2044140	20	44	140	MP2544160	25	44	160	MP3049140	30	49	140
MP1624200	16	24	200	MP2044160	20	44	160	MP2544180	25	44	180	MP3049160	30	49	160
MP162960	16	29	60	MP2044180	20	44	180	MP254980	25	49	80	MP3049200	30	49	200
MP162980	16	29	80	MP204980	20	49	80	MP2549100	25	49	100	MP3049220	30	49	220
MP1629100	16	29	100	MP2049100	20	49	100	MP2549120	25	49	120	MP3059120	30	59	120
MP1629120	16	29	120	MP2049120	20	49	120	MP2549140	25	49	140	MP3059140	30	59	140
MP1629140	16	29	140	MP2049140	20	49	140	MP2549160	25	49	160	MP3059160	30	59	160
MP163460	16	34	60	MP2049160	20	49	160	MP2549180	25	49	180	MP3059200	30	59	200
MP163480	16	34	80	MP2049180	20	49	180	MP2559100	25	59	100	MP3059220	30	59	220
MP1634100	16	34	100	MP2059100	20	59	100	MP2559120	25	59	120	MP3069120	30	69	120
MP1634120	16	34	120	MP2059120	20	59	120	MP2559140	25	59	140	MP3069140	30	69	140
MP1634140	16	34	140	MP2059140	20	59	140	MP2559160	25	59	160	MP3069160	30	69	160
MP163960	16	39	60	MP2059160	20	59	160	MP2559180	25	59	180	MP3069200	30	69	200
MP163980	16	39	80	MP2059180	20	59	180	MP2569120	25	69	120	MP3069220	30	69	220
MP1639100	16	39	100	MP2069120	20	69	120	MP2569140	25	69	140	MP3079120	30	79	120
MP1639120	16	39	120	MP2069140	20	69	140	MP2569160	25	69	160	MP3079140	30	79	140
MP1639140	16	39	140	MP2069160	20	69	160	MP2569180	25	69	180	MP3079160	30	79	160
MP164460	16	44	60	MP2069180	20	69	180	MP2579140	25	79	140	MP3079160	30	79	160
MP164480	16	44	80	MP2079140	20	79	140	MP2579160	25	79	160	MP3079200	30	79	200
MP1644100	16	44	100	MP2079160	20	79	160	MP2579180	25	79	180	MP3079220	30	79	220
MP1644120	16	44	120	MP2079180	20	79	180	MP3044120	30	44	120				
MP1644140	16	44	140	MP254480	25	44	80	MP3044140	30	44	140				
MP204480	20	44	80	MP2544100	25	44	100	MP3044160	30	44	160				



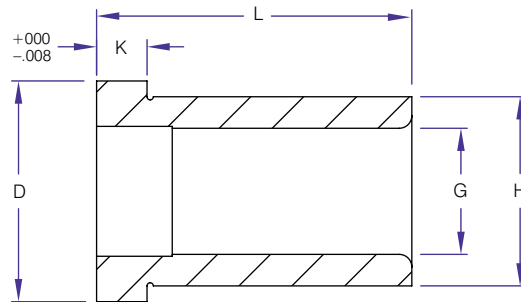
Material: SAE52100
Induction Hardened
Hardness: 60+/-2RC

General Dimensions				
Nom Dia	H	K	P	M
16	21	6	K6	50-90=19, 100-200=24, 220-240=34
20	25	6	K6	50-100=19, 120-140=24, 160-240=34
25	30	8	K6	50-120=24, 140=29, 160-300=34
30	35	8	K6	70-80=24, 90-160=29, 180-2000=39, 220-300=49
35	40	8	K6	90-120=29, 140-240=49, 260-300=59
40	45	10	K7	100-160=35, 180-300=45
50	56	12	K7	140-400=45, 450-500=80

L +0 +1.5	Product Code							
	G16	G20	G25	G30	G35	G40	G50	G60
30				ML3030				
50	ML1650	ML2050	ML2550					
60	ML1660	ML2060	ML2560					
70	ML1670	ML2070	ML2570	ML3070				
80	ML1680	ML2080	ML2580	ML3080				
90	ML1690	ML2090	ML2590	ML3090	ML3590			
100	ML16100	ML20100	ML25100	ML30100	ML35100	ML40100		
120	ML16120	ML20120	ML25120	ML30120	ML35120	ML40120		
140	ML16140	ML20140	ML25140	ML30140	ML35140	ML40140	ML50140	
160	ML16160	ML20160	ML25160	ML30160	ML35160	ML40160	ML50160	
180	ML16180	ML20180	ML25180	ML30180	ML35180	ML40180	ML50180	
200	ML16200	ML20200	ML25200	ML30200	ML35200	ML40200	ML50200	
220	ML16220	ML20220	ML25220	ML30220	ML35220		ML50220	
240	ML16240	ML20240	ML25240	ML30240	ML35240	ML40240	ML50240	
260			ML25260	ML30260	ML35260	ML40260	ML50260	
280			ML25280	ML30280	ML35280	ML40280	ML50280	
300			ML25300	ML30300	ML35300	ML40300	ML50300	
350						ML40350	ML50350	
400						ML40400	ML50400	ML60400
450							ML50450	
500							ML50500	

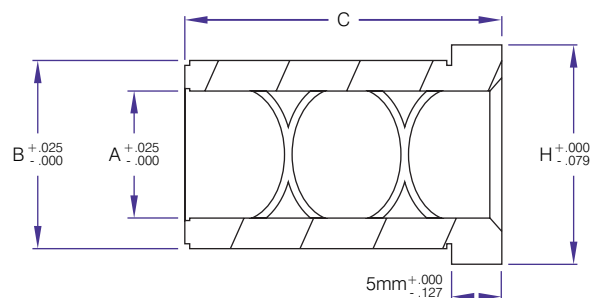


Material: SUJ2
Hardness: 60-2RC



G	H	Tolerance	D	K
16	25	+0.021	30	6
20	30	+0.008	35	8
25	35	+0.025 +0.009	40	8
30	42	+0.018	47	10
35	48	+0.002	53	10
40	55	+0.021	60	10
50	70	+0.002	76	12

L +0 -1.5	Product Code							
	G 16	G 20	G 25	G 30	G 35	G 40	G 50	G60
20	MB1620	MB2020	MB2520	MB3020	MB3520			
25	MB1625	MB2025	MB2525	MB3025	MB3525			
30	MB1630	MB2030	MB2530	MB3030	MB3530			
35	MB1635	MB2035	MB2535	MB3035	MB3535	MB4035		
40	MB1640	MB2040	MB2540	MB3040	MB3540	MB4040		
45	MB1645	MB2045	MB2545	MB3045	MB3545	MB4045		
50	MB1650	MB2050	MB2550	MB3050	MB3550	MB4050	MB5050	
55		MB2055	MB2555	MB3055				
60	MB1660	MB2060	MB2560	MB3060	MB3560	MB4060	MB5060	
65		MB2065	MB2565	MB3065				
70		MB2070	MB2570	MB3070	MB3570	MB4070	MB5070	
80		MB2080	MB2580	MB3080	MB3580	MB4080	MB5080	
90		MB2090	MB2590	MB3090	MB3590	MB4090	MB5090	
100		MB20100	MB25100	MB30100	MB35100	MB40100	MB50100	MB60100
110		MB20110	MB25110	MB30110	MB35110	MB40110	MB50110	
120		MB20120	MB25120	MB30120	MB35120	MB40120	MB50120	MB60120
130			MB25130	MB30130	MB35130	MB40130	MB50130	
140				MB30140	MB35140	MB40140	MB50140	
150				MB30150	MB35150	MB40150	MB50150	MB60150

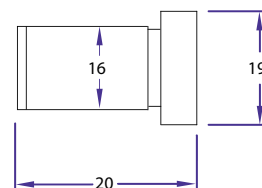
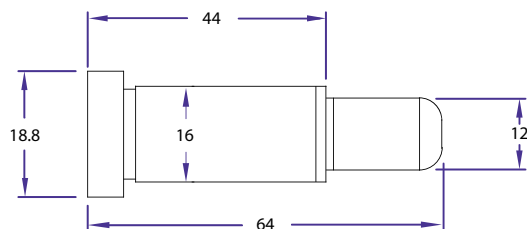


Product Code	A	B	C	D
LBBM2025	20	25	26	28
LBBM2030	20	30	26	28
LBBM2040	20	40	26	28
LBBM2050	20	50	26	28
LBBM2080	20	80	26	28
LBBM20100	20	100	26	28
LBBM2530	25	30	32	35
LBBM2540	25	40	32	35
LBBM2550	25	50	32	35
LBBM2565	25	65	32	35
LBBM2580	25	80	32	35
LBBM25100	25	100	32	35
LBBM3025	30	25	38	41
LBBM3030	30	30	38	41
LBBM3040	30	40	38	41
LBBM3050	30	50	38	41
LBBM3065	30	65	38	41
LBBM3080	30	80	38	41
LBBM30100	30	100	38	41
LBBM30120	30	120	38	41
LBBM30140	30	140	38	41
LBBM30150	30	150	38	41
LBBM4040	40	40	50	53
LBBM4050	40	50	50	53
LBBM4065	40	65	50	53
LBBM4080	40	80	50	53
LBBM40100	40	100	50	53
LBBM40120	40	120	50	53
LBBM40150	40	150	50	53
LBBM5030	50	30	60	63
LBBM5050	50	50	60	63
LBBM5065	50	65	60	63
LBBM5080	50	80	60	63
LBBM50100	50	100	60	63
LBBM60100	60	100	70	73

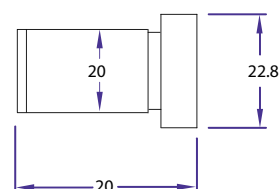
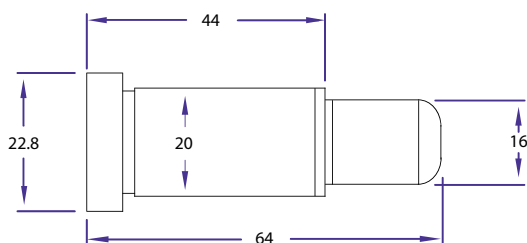
Product Code	Product Title	G Tolerance	H Tolerance	L Dimension
REGENTPIN-M12	M12-44-64 Regent Pin	0/-0.015	0.01/0	0/-1.5
REGENTBUSH-M12	M12-20 Regent Bush	0/-0.015	0.01/-0	0/-1.5
REGENTPIN-M15	M15-44-64 Regent Pin	0/-0.015	0.01/-0	0/-1.5
REGENTBUSH-M15	M15-20 Regent Bush	0/-0.015	0.01/-0	0/-1.5



Regent Pin & Bush M12



Regent Pin & Bush M16

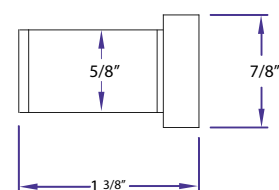
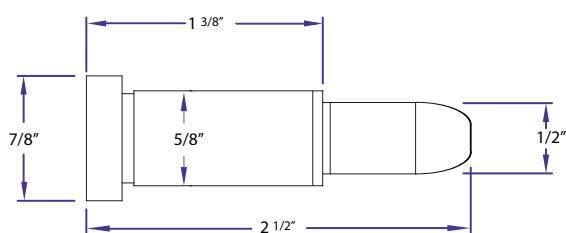


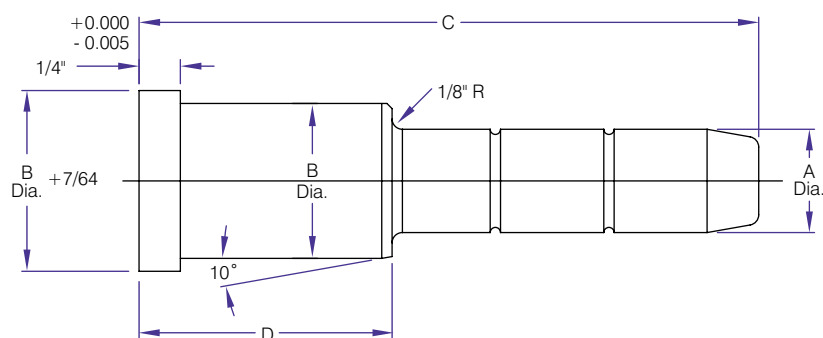
Inch Pins and Bushes - Imperial

Product Code	Product Title	L Dimension
GP028	GP25 Guide Pillar	2 1/2"
GB42	GB42 Guide Bush	1 3/8"



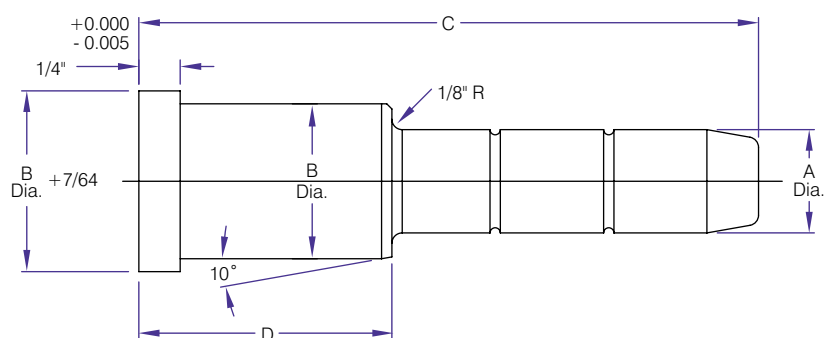
Inch Pin & Bush





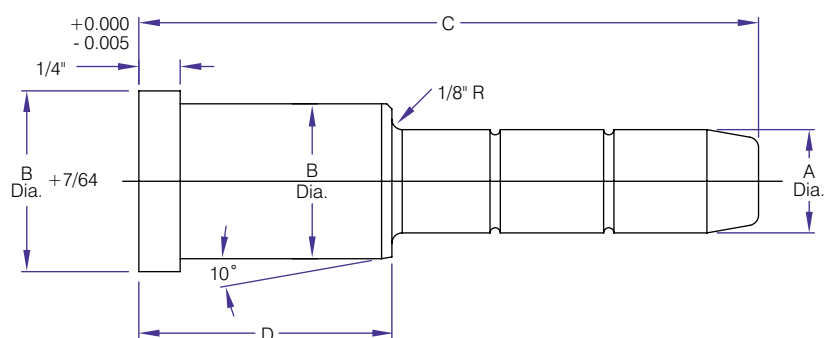
A Nominal: 1/2" B Nominal: 5/8"				
Product Code	A Tolerance	B Tolerance	Dimensions	
			C	D
GP002	.4995"	.6264"	2 3/4"	1 1/2"
GP000	.4990"	.6257"	3 1/4"	7/8"
GP004			3 1/4"	1 1/2"
GP006			3 3/4"	2 7/16"
GP001			4 1/4"	1 3/8"
GP028			2 1/4"	1.375"

A Nominal: 5/8" B Nominal: 7/8"						
Product Code	A Tolerance	B Tolerance	Dimensions			
			C	D	M	R
GP162			2 1/2"	7/8"		
GP165			2 1/2"	1 3/8"		
GP163			3"	7/8"		
GP166			3"	1 3/8"		
GP169			3"	1 7/8"		
GP164	.6244"	.8763"	3 1/2"	7/8"		
GP167			3 1/2"	1 3/8"	63/64"	3/32"
GP190	.6237"	.8758"	3 1/2"	1 7/8"		
GP193			3 1/2"	2 3/8"		
GP168			4"	1 3/8"		
GP191			4"	1 7/8"		
GP194			4"	2 3/8"		
GP192			4 1/2"	1 7/8"		
GP195			4 1/2"	2 3/8"		
GP196			5"	2 3/8"		



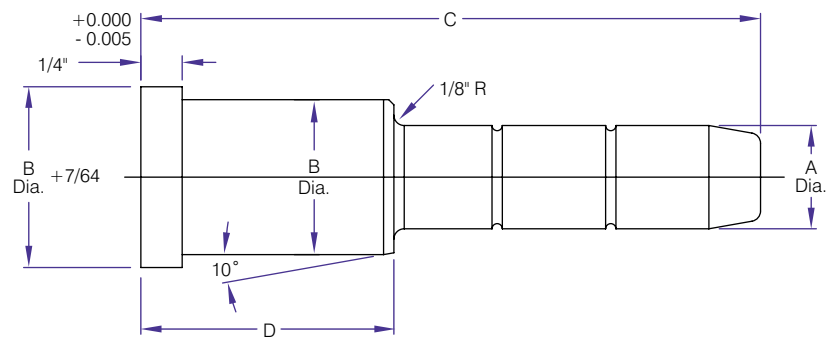
A Nominal: 3/4" B Nominal: 1"				
Product Code	A Tolerance	B Tolerance	Dimensions	
			C	D
GP012			2 5/8"	1 3/8"
GP003			2 7/8"	7/8"
GP009			2 7/8"	1 1/8"
GP010	.7495"	1.0008"	2 7/8"	1 1/2"
GP005			3 1/2"	7/8"
GP011	.7483"	1.0016"	3 1/4"	1 1/8"
GP017			3 1/4"	1 3/8"
GP014			3 3/8"	2"
GP007			3 3/4"	7/8"
GP013			3 3/4"	1 3/8"
GP065			3 3/4"	1 1/2"
GP023			3 3/4"	1 7/8"
GP016			4 1/8"	1 1/2"
GP019			4 1/4"	1 3/8"
GP060			4 1/4"	1 7/8"
GP066			4 1/4"	2"

A Nominal: 3/4" B Nominal: 1"				
Product Code	A Tolerance	B Tolerance	Dimensions	
			C	D
GP024			4 1/4"	2 3/8"
GP062			4 3/4"	7/8"
GP025			4 3/4"	1 7/8"
GP061			4 3/4"	2 3/8"
GP018		1.008	4 7/8"	2"
GP015			5 1/4"	1 1/8"
GP063		1.0016	5 1/4"	1 3/8"
GP026			5 1/4"	2 3/8"
GP020			6"	1 3/8"
GP021			6"	1 7/8"
GP064			6 1/4"	2 3/8"
GP 50			7 1/8"	1 3/4"
GP022			7 1/2"	2 3/8"
GP053			8 5/8"	1 3/4"
GP056			10 1/8"	1 3/4"
GP059			11 5/8"	1 3/4"



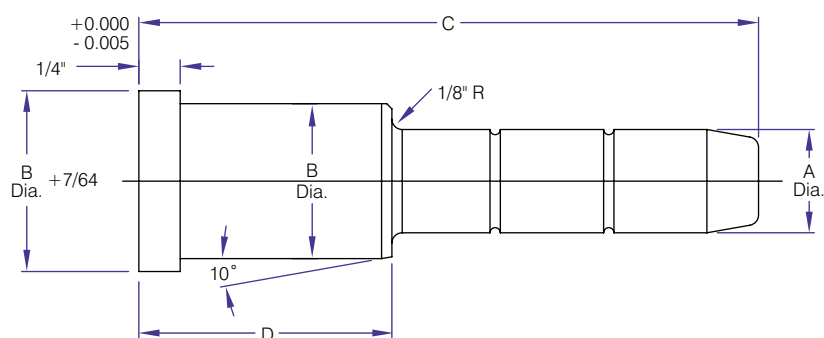
A Nominal: 7/8" B Nominal: 1 1/4"				
Product Code	A Tolerance	B Tolerance	Dimensions	
			C	D
GP071			2 3/4"	7/8"
GP074			2 3/4"	1 3/8"
GP084			3 1/4"	7/8"
GP072	.874"	1.252"	3 1/4"	1 1/8"
GP085	.873"	1.251"	3 1/4"	1 3/8"
GP086			3 3/4"	7/8"
GP087			3 3/4"	1 3/8"
GP088			3 3/4"	1 7/8"
GP073			4 1/4"	1 1/8"
GP100			4 1/4"	1 7/8"
GP081			4 1/2"	2 3/8"
GP101			4 3/4"	7/8"
GP075			4 3/4"	1 3/8"

A Nominal: 7/8" B Nominal: 1 1/4"				
Product Code	A Tolerance	B Tolerance	Dimensions	
			C	D
GP077			4 3/4"	1 7/8"
GP089			5 1/4"	2 3/8"
GP076			5 3/4"	1 3/8"
GP078		1.251	5 3/4"	1 7/8"
GP082		1.252	6"	2 7/8"
GP102			6 1/4"	2 3/8"
GP079			6 1/2"	1 3/8"
GP090			7 5/8"	1 3/4"
GP080			8"	1 3/8"
GP093			9 1/8"	1 3/4"
GP083			9 1/2"	3 3/8"
GP096			10 5/8"	1 3/4"
GP099			12 1/8"	1 3/4"



A B Nominal: 1"				
Product Code	A Tolerance	B Tolerance	Dimensions	
			C	D
GP116	.998"	1.376	3"	7/8"
GP123	.999"	1.377	3 1/4"	1 3/8"
GP125			3 3/4"	1 7/8"
GP117			4"	7/8"
GP118			4"	1 3/8"
GP127			4 1/4"	1 7/8"
GP158			4 1/4"	2"
GP126			4 3/8"	2 1/4"
GP120			4 1/2"	1 3/8"
GP119			4 1/2"	2 3/8"
GP130			4 7/8"	2 1/4"
GP129			5 1/4"	1 7/8"
GP128			5 3/8"	2 3/4"
GP121			5 1/2"	1 3/8"
GP136			5 1/2"	2 3/8"
GP142			5 1/2"	2 7/8"
GP143			6"	2 7/8"
GP139			6"	3 3/4"
GP138			6 1/4"	1 7/8"

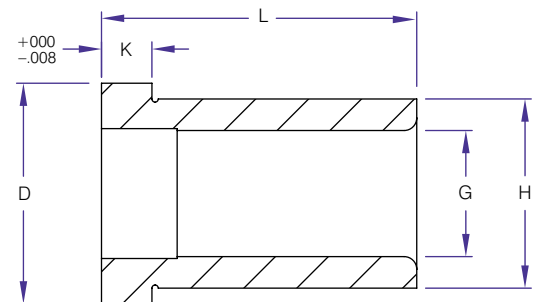
A B Nominal: 1"				
Product Code	A Tolerance	B Tolerance	Dimensions	
			C	D
GP131			6 3/8"	3"
GP122			6 1/2"	1 3/8"
GP141			6 1/2"	2 3/8"
GP144			6 1/2"	2 7/8"
GP159			6 1/2"	3 7/8"
GP156			6 3/4"	1 7/8"
GP137			7"	2 3/4"
GP157			7 1/4"	2 3/8"
GP155			7 1/4"	2 7/8"
GP124			7 1/2"	2 1/2"
GP132			8"	1 3/8"
GP134			8"	2 3/4"
GP140			9 1/4"	1 3/8"
GP133			10"	1 3/8"
GP145			10"	2 1/4"
GP135			10"	2 3/4"
GP148			11 1/2"	2 1/4"
GP151			13"	2 1/4"



A Nominal: 1 1/4" B Nominal: 1 3/4"				
Product Code	A Tolerance	B Tolerance	Dimensions	
			C	D
GP043			4 3/4"	1 7/8"
GP032			5 1/2"	1 3/8"
GP044			5 3/4"	1 7/8"
GP046			5 3/4"	2 3/8"
GP041			6 3/8"	2 3/4"
GP035			6 3/8"	3"
GP042			6 3/8"	3 3/4"
GP033			6 1/2"	1 3/8"
GP047	1.248"	1.751"	6 3/4"	2 3/8"
GP038			7 3/8"	2 3/4"
GP036			7 3/8"	3 3/4"
GP048			7 3/8"	4"
GP034			7 1/2"	1 3/8"
GP031			7 5/8"	4 7/8"
GP037			8"	2 3/4"
GP039			9"	2 3/4"
GP049			9 1/4"	1 7/8"
GP040			9 3/8"	4 3/4"

A Nominal: 1 1/2" B Nominal: 2"				
Product Code	A Tolerance	B Tolerance	Dimensions	
			C	D
GP200	1.499"	2.002"	6 1/2"	3"
	1.498"	2.001"		

A Nominal: 1 3/4" B Nominal: 2 1/4"				
Product Code	A Tolerance	B Tolerance	Dimensions	
			C	D
GP300	1.749"	2.252"	8"	4"
GP310	1.748"	2.251"	9"	4"
GP320			10"	4"



A Nominal: 1/2"
B Nominal: 5/8"

Product Code	G Tolerance	H Tolerance	L Dimension
GB40	.5007"	.6264"	7/8"
GB41	.5002"	.6257"	1 1/8"
GB42			1 3/8"

G Nominal: 5/8"
H Nominal: 7/8"

Product Code	G Tolerance	H Tolerance	L Dimension
GB25	.6257"	.8763"	7/8"
GB26			1 3/8"
GB27	.6250"	.8758"	1 7/8"
GB28			2 3/8"

G Nominal: 3/4"
H Nominal: 1"

Product Code	G Tolerance	H Tolerance	L Dimension
GB34			5/8"
GB03			7/8"
GB02	.7510	1.0016	1 1/4"
GB35	.7503	1.0009	1 3/8"
GB04			1 1/2"
GB05			1 1/2"
GB31			1 7/8"
GB32			2 1/8"
GB33			2 3/8"
GB36			2 5/8"

G Nominal: 7/8"
H Nominal: 1 1/4"

Product Code	G Tolerance	H Tolerance	L Dimension
GB 7			5/8"
GB71			7/8"
GB72	.8761"	1.252"	1 3/8"
GB73	.8753"	1.251"	1 7/8"
GB74			2 1/8"
GB75			2 3/8"
GB76			2 7/8"

A Nominal: 1"
B Nominal: 1 3/8"

Product Code	G Tolerance	H Tolerance	L Dimension
GB44			7/8"
GB07			1 1/8"
GB45	1.0012"	1.377"	1 3/8"
GB06	1.0003"	1.376"	1 1/2"
GB09			1 7/8"
GB10			2 1/4"
GB11			2 3/8"
GB12			2 1/2"
GB08			2 7/8"
GB13			3 1/2"

G Nominal: 1 1/4"
H Nominal: 1 3/4"

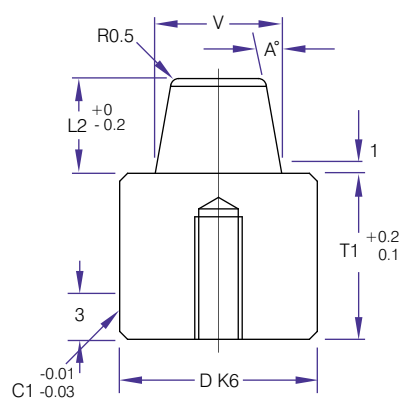
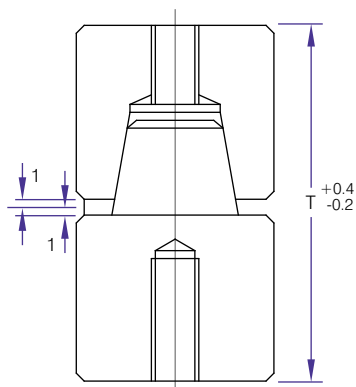
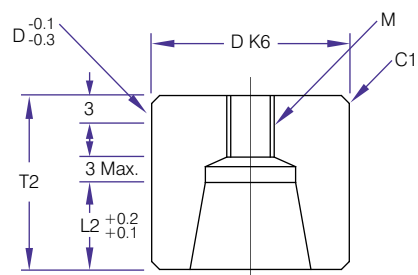
Product Code	G Tolerance	H Tolerance	L Dimension
GB20			7/8"
GB21			1 3/8"
GB 2	1.2513"	1.752"	1 7/8"
GB19	1.2503"	1.751"	2 5/8"
GB18			2 7/8"
GB15			3 3/8"
GB23			3 5/8"
GB14			3 7/8"
GB17			4 3/8"
GB16			4 3/4"

G Nominal: 1 1/2"
H Nominal: 2"

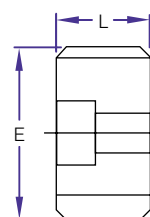
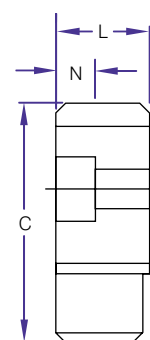
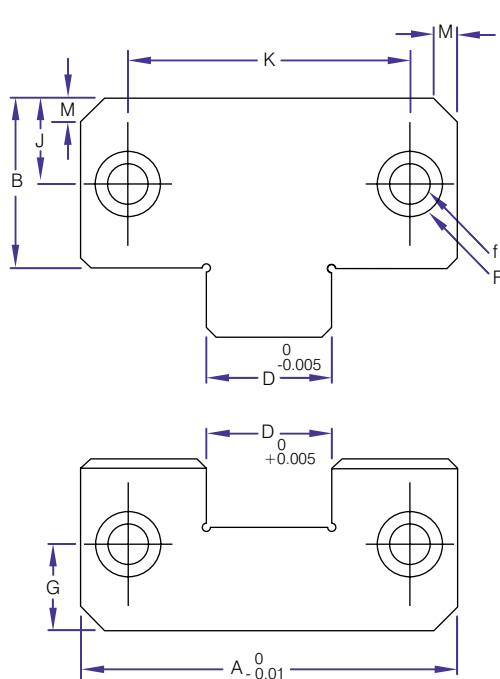
Product Code	G Tolerance	H Tolerance	L Dimension
GB100	1.5014"	2.002"	3 3/4"
	1.5003"	2.001"	



Material: SUJ2
HRC: 55-60



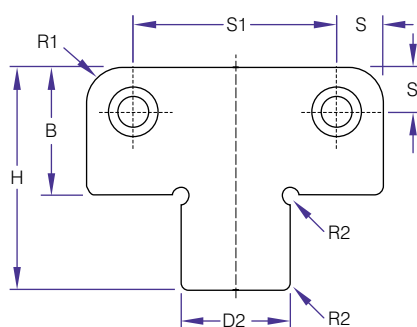
Product Code	D k6		T	T1 . T2	MxL	A	V	L1	L2
TLP-16	16	+0.012 +0.001	30	14	M5x10		10	5	6
TLP-20	20	+0.015 +0.002	40	19	M6x12		13	8	9
TLP-25	25	+0.015 +0.002	50	24	M8x16	5°	16	11	12
TLP-30	30	+0.015 +0.002	60	29	M10x20		20	14	15
TLP-32	32	+0.018 +0.002	60	29	M10x20		20	14	15



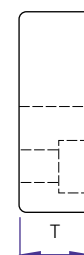
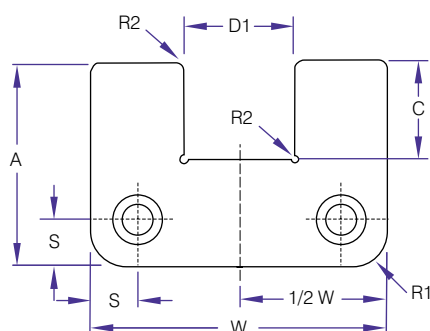
Product Code	A	B	C	D	E	F	f	G	J	K	L	M	N
GPL038	38	22	30	12	22	10.5	6.5	7	7	22	13	5	8
GPL050	50	21.5	30	17	21.5	10.5	6.5	11	11	34	16	5	8
GPL075	75	36	50	25	36	16.5	10.5	18	18	50	19	8	12
GPL100	100	45	65	35	45	16.5	10.5	22	22	70	19	10	12
GPL125	125	45	65	45	45	16.5	10.5	22	22	84	25	10	12



Male: YK30
54~56HRC
Black Oxide Finish

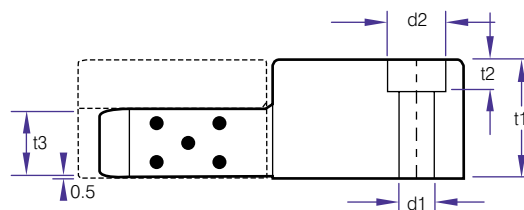
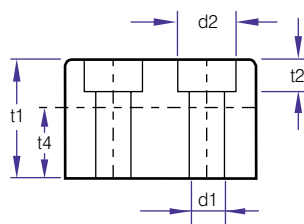
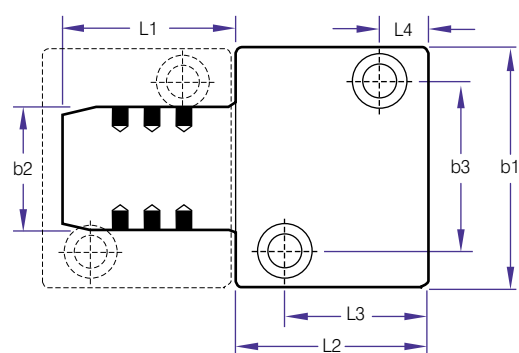
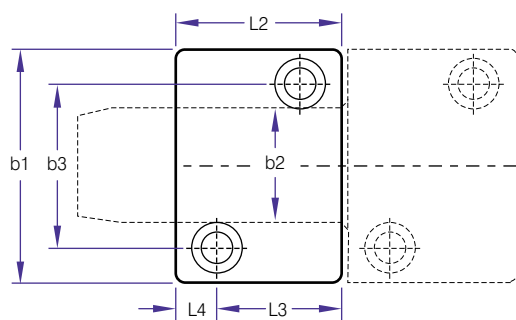


Female: SKD11(D2)
58~62HRC
Titanium Nitride Coated



METRIC STANDARD

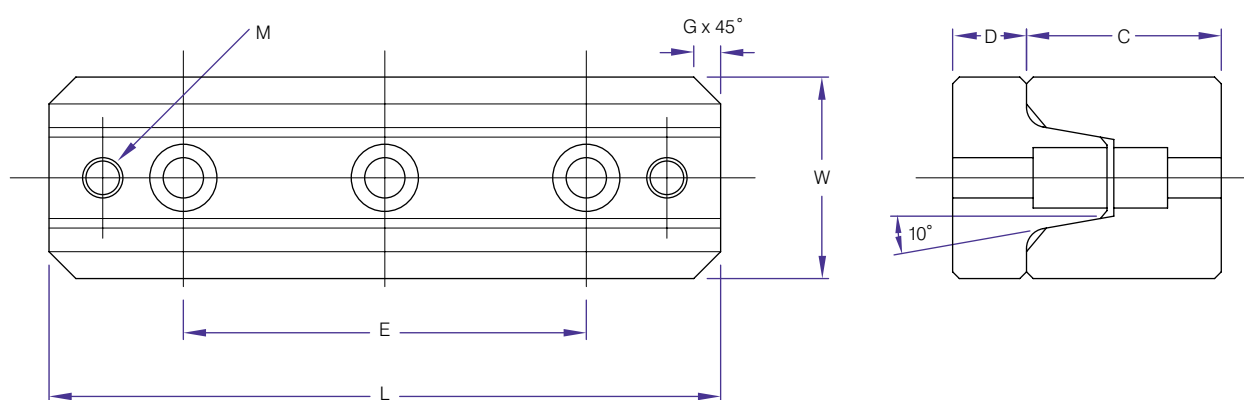
Product Code	W +.00 -.05	T +.00 -.05	A +.00 -.05	B +.00 -.05	C +.00 -.05	D .002/.005 Clearance Per Side	H +0.0 -0.1	R Pocket Radius	S1	S	SHCS
CSLM50	16	50	21.5	21.5	12	17	43	5	34	11	M6-1.0 x 18
CSLM75	19	75	36	36	17	25	72	5	50	18	M10-1.5 x 20
CSLM100	19	100	45	45	23	35	90	5	70	22	M10-1.5 x 20
CSLM125	25	125	45	45	23	35	90	5	84	22	M10-1.5 x 25



Product Code	b2 g5	L1	t4	t3	t2	t1	d2	d1	L4	L3	L2 -0.5 -0.7	B3	B1
HSBR2025	20	25	14	13	6.8	22	11	6.6	7	19	27	31	45
HSBR2532	25	32	15	14	6.8	25	11	6.6	9	27	36	35	50
HSBR3240	32	40	20	19	9.0	32	15	9.0	11	35	46	45	63



Material: S50C
HRC 52-56

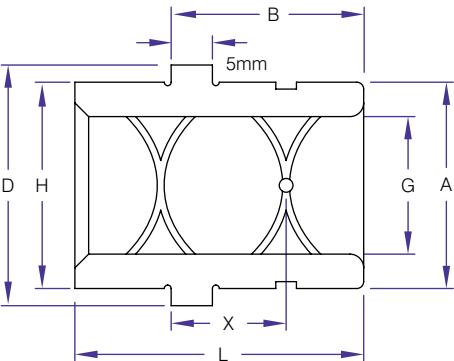


METRIC

Product Code	Description	E	L	W	D	C	G	M
HBS050	50mm Tapered Block Set	36	50	25	8	17.5	5	M5
HBS100	100mm Tapered Block Set	60	100	30	10	22	4	M6
HBS150	150mm Tapered Block Set	100	150	40	13	25	5	M8

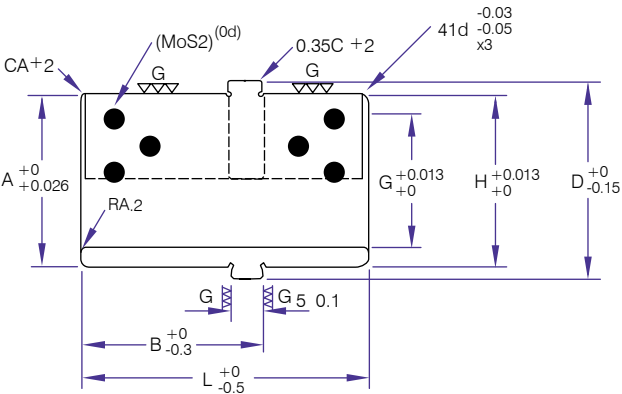
IMPERIAL

Product Code	Description	E	L	W	D	C	G	M
HBS2	2" Tapered Block Set	36	50.29	25.36	7.92	17.53	5.08	3/16"-24
HBS4	4" Tapered Block Set	63.5	101.09	31.71	9.53	22.1	5.08	1/4"-20
HBS6	6" Tapered Block Set	101.6	151.89	38.06	12.7	25.4	5.08	3/8"-16



Product Code	G +.013 -.000	H +.013 -.000	A +.000 -.026	D +.000 -.13	L +.000 -.8	B +.000 -.4	X
EJM20	20	26	26	28	37	25	15
EJM25	25	32	32	35	45	29	16
EJM30	30	38	38	41	45	29	16

Ejector Bush - Graphite

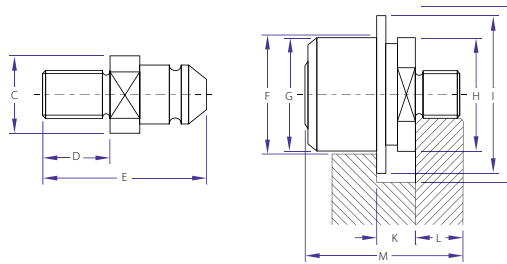


Product Code	G	H	A	D	L	B	RA	CA	(ød)
EGM20	20	26	26	28	37	25	1.25	0.5	4
EGM25	25	32	32	35	45	29	1.5	0.6	5
EGM30	30	38	38	41	45	29	2.0	0.7	5

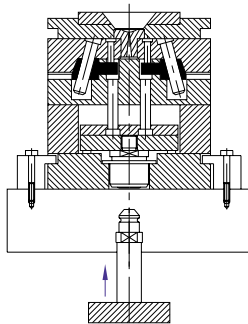


Material SAE52100
 Hardness 60+2RC
 Induction Heat Treated
 *Tolerance on the "P" Dimensions is -.5 mm

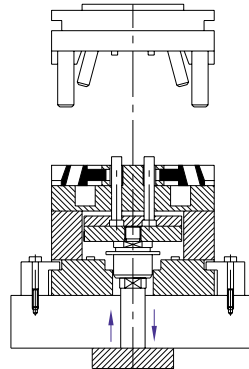
Product Code	P	L	N	T	H	D
MAP12140	12	140	33	10	17	+0.12 +0.01
MAP16100	16	100	28	12	21	
MAP16120	16	120	28	12	21	
MAP16140	16	140	33	12	21	
MAP16160	16	160	33	12	21	
MAP16180	16	180	38	12	21	
MAP20120	20	120	32	15	25	
MAP20140	20	140	37	15	25	
MAP20160	20	160	37	15	25	
MAP20200	20	200	42	15	25	
MAP20220	20	220	42	15	25	
MAP25160	25	160	52	15	30	
MAP25180	25	180	52	15	30	
MAP25200	25	200	52	15	30	
MAP25260	25	260	57	15	30	
MAP30200	30	200	50	20	35	
MAP30260	30	260	60	20	35	
MAP30300	30	300	60	20	35	



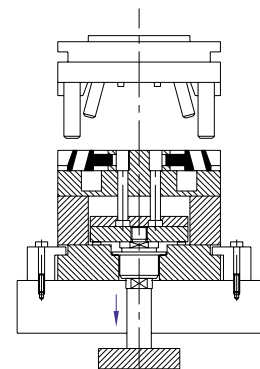
Mould Closed
Material Injected



Mould Open-Coupler
Engages & Pushes Forward



Coupler and Bars Pull
Back the Ejector Plate



COUPLER

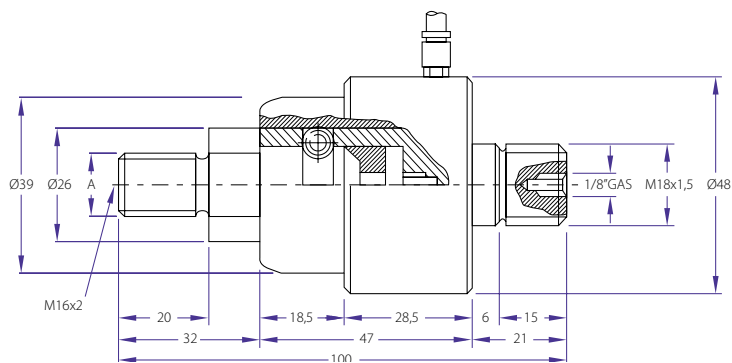
Product Code	Thread	F	G	H	I	J	K	L	M
302M12COUP	12x1.75	34	32	32	40	43	9	15	42.55
402M16COUP	16x1.5	40	38	38.1	48	50.6	13	15.24	52
402M162COUP	16x2	40	38	38.1	48	50.6	13	15.24	52
402M20COUP	20x1.5	40	38	38.1	48	50.6	13	15.24	52
412M16COUP	16x1.5	58	56	52	65	70	17	18	68

BARB

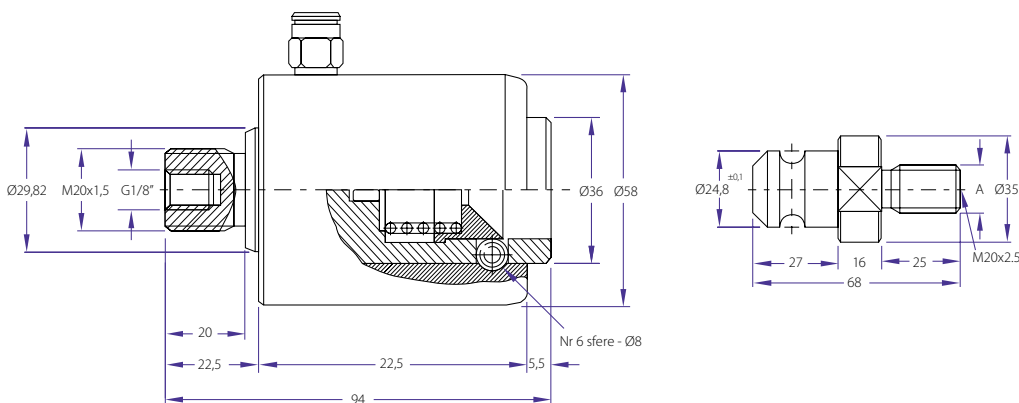
Product Code	Thread	C	D	E	Pulling Force
301M12BARB	12x1.75	22.8	20	45.5	1500Kg
401M16BARB	16x2	25.8	20	55	2400Kg
401M20BARB	20x2.5	25.8	20	55	2400Kg
411M16BARB	16x2	35	35	68	3200Kg



Standard Coupler



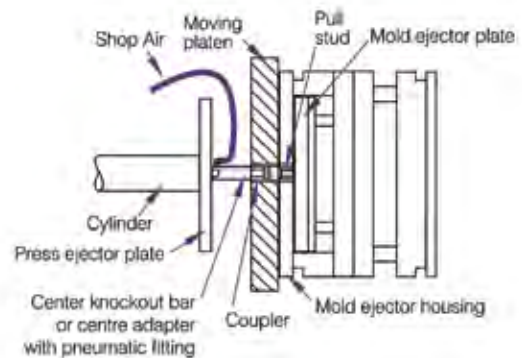
Large Coupler



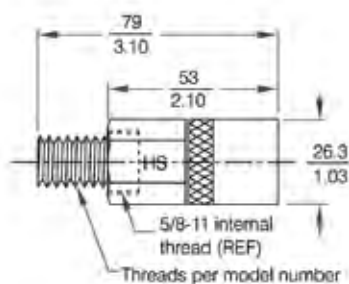
Product Code	Description
QKAC18	Standard Coupler
QKAC20	Large Coupler



FasTie Quick-Connect Ejector System “tie-in” the mould ejector plate to the press ejection system. A pneumatically-operated piston inside the coupler releases the pull stud from the press ejection system to reduce set-up and change-out times.

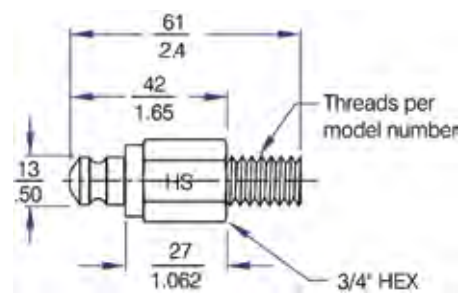


High Strength FasTie Couplers

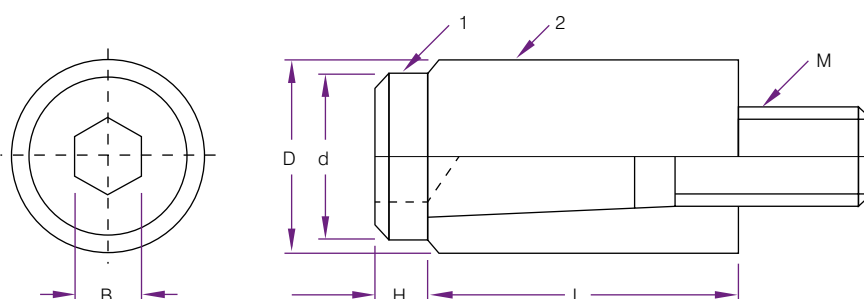


Product Code	Thread Size
FTFHS-50	1/2-13
FTFHS-63	5/8-11
FTFHS-M12	M12 x 1.75
FTFHS-M16	M16 x 2

High Strength FasTie Stud



Product Code	Thread Size
FTMHS-38	3/8-16
FTMHS-50	1/2-13
FTMHS-63	5/8-11
FTMHS-M12	M12 x 1.75
FTMHS-M16	M16 x 2
FTMHS-M20	M20 x 2.5

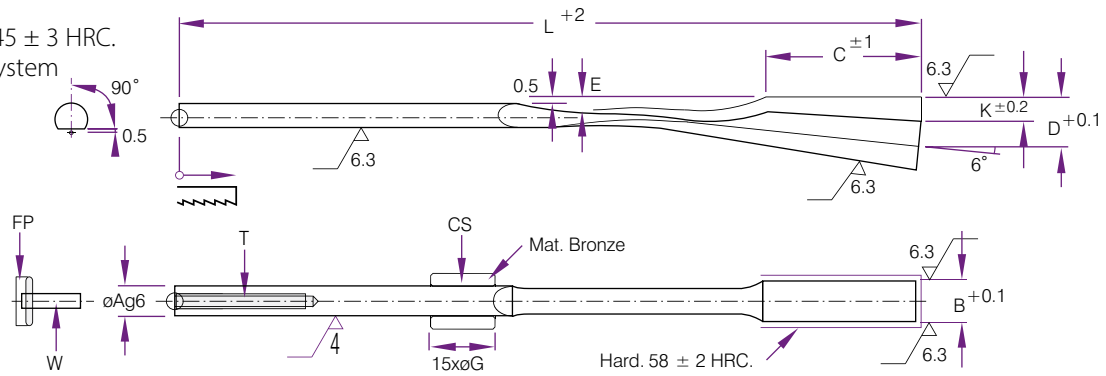


1. Use sloping screw to adjust mould plate and parting locks, then turn 90 degrees.
2. Easy to assemble and disassemble, and cost efficient.
3. Can also be installed into small, medium size, and 2-sectional injecting metal pipes, or can be installed on sliding bases.
4. Mould weight < 100kg, using 4 pcs of 12 Ø
Mould weight < 500kg, using 4 pcs of 16 Ø
Mould weight < 1,000kg, using 4 pcs of 20 Ø
Mould weight > 1,000kg using at least 6 pcs.
5. Insert parting locks into die mould about 3cm, then using H7 reamer to process mould hole within +0.1mm range.
6. Do not add any oil on parting locks, doing so will reduce the friction.

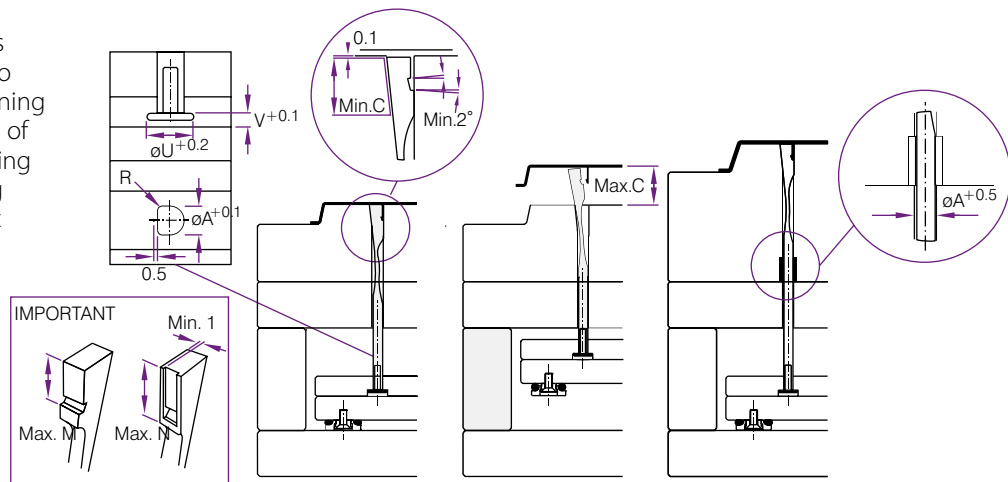
Product Code	D	d	H	L	M	B
GPLA10	10	8.5	3	18	M5	4
GPLA12	12	11	3.5	20	M6	5
GPLA13	13	11	3.5	20	M6	5
GPLA16	16	14	4	25	M8	6
GPLA20	20	16	5	30	M10	8



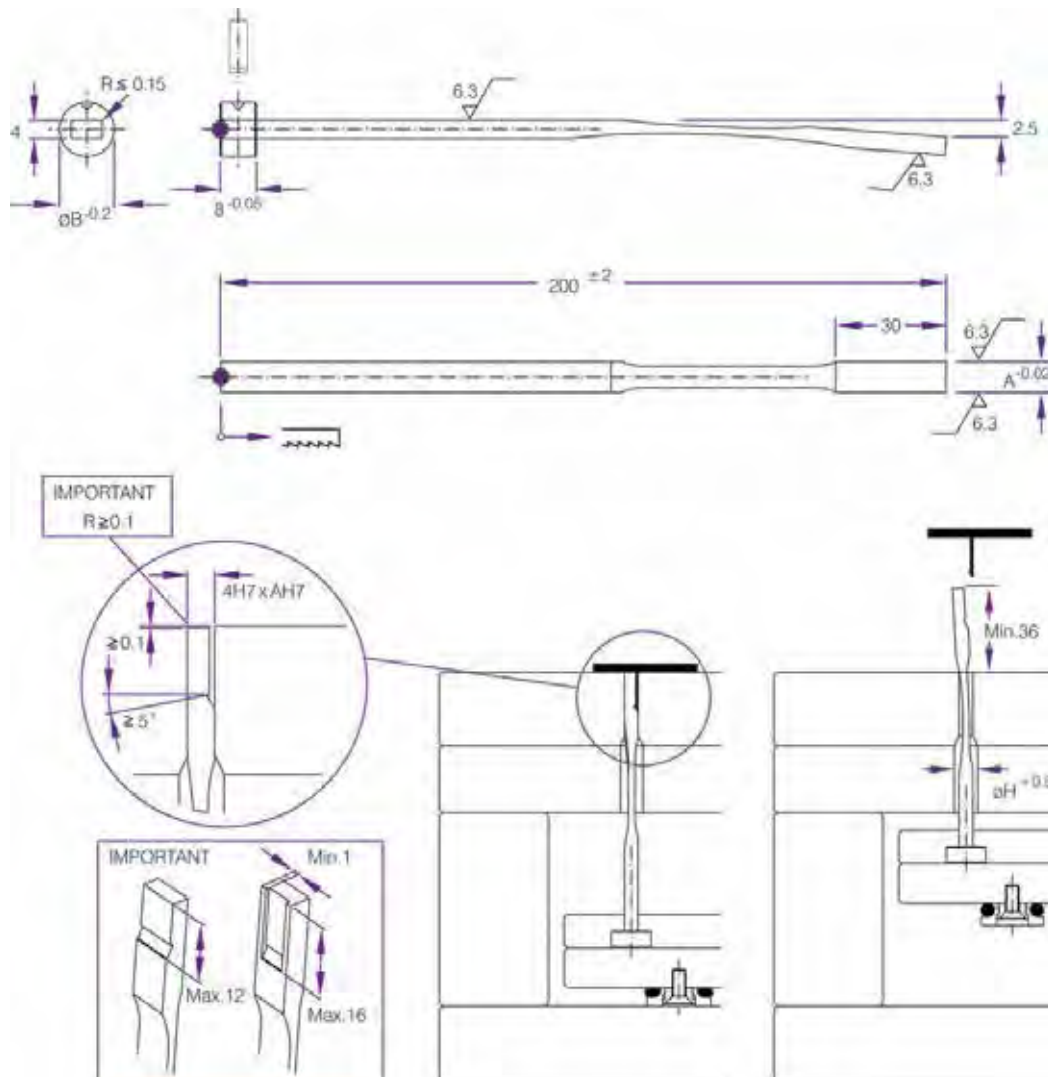
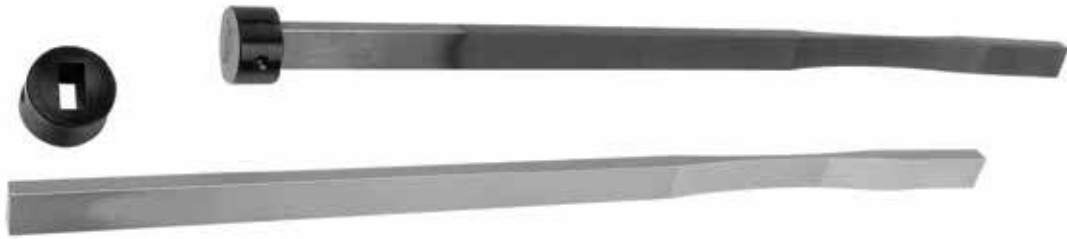
Mat.:1.8159
Hardened 45 ± 3 HRC.
Patented System



Minimum space required for installation, only needs the space of an ejector. No milling, grinding or hardening other than the machining of detail needed. All machining is made 90° to the parting line. No need for complex mechanical systems.



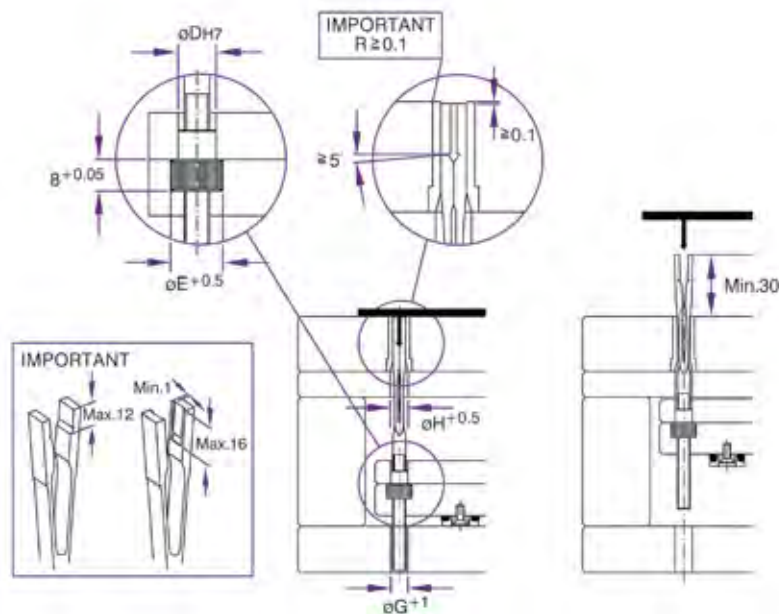
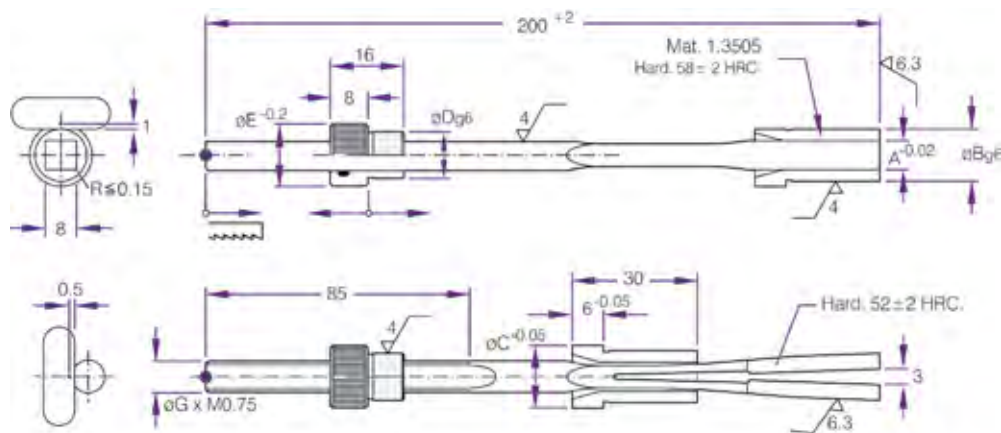
Product Code	A	B	C	D	E	G	K	L	M	N	R	T	U	V	W	CS
PW.060622	6	6.2	22	9	3.5		3.5	125	16	18	1.25	M4x36	12	5	M4x16 (DIN7991)	
PW.060630	6	6.2	30	10	3.5	12	4.5	175	20	26	1.25	M4x36	12	5	M4x16 (DIN7991)	•
PW.060822	6	8.2	22	9	3.5		3.5	125	16	18	1.25	M4x36	12	5	M4x16 (DIN7991)	
PW.060830	6	8.2	30	10	3.5	12	4.5	175	20	26	1.25	M4x36	12	5	M4x16 (DIN7991)	•
PW.080825	8	8.2	25	11.5	4.5		4.5	140	18	21	2	M5x36	14	6	M5x16 (DIN7984)	
PW.081025	8	10.2	25	11.5	4.5		4.5	140	18	21	2	M5x36	14	6	M5x16 (DIN7984)	
PW.081030	8	10.2	30	11.2	4.5	12	4.5	175	20	26	2	M5x36	14	6	M5x16 (DIN7984)	•
PW.081225	8	12.2	25	11.5	4.5		4.5	140	18	21	2	M5x36	14	6	M5x16 (DIN7984)	
PW.081230	8	12.2	30	11.2	4.5	12	4.5	175	20	26	2	M5x36	14	6	M5x16 (DIN7984)	•
PW.101430	10	14.2	30	13.6	5.5	16	5.5	175	20	26	2.5	M6x36	18	8	M6x16 (DIN7984)	•
PW.101630	10	16.2	30	13.6	5.5	16	5.5	175	20	26	2.5	M6x36	18	8	M6x16 (DIN7984)	•
PW.101830	10	18.2	30	13.6	5.5	16	5.5	175	20	26	2.5	M6x36	18	8	M6x16 (DIN7984)	•



Mat.: 1.2101
Hardened 45 ± 3 HRC.
Patented System

Minimum space required for installation, only needs the space of an ejector. No milling, grinding or hardening other than the machining of detail needed. All drilling is 90° to the parting line. Available with and without Balinit C[®] coating.

Product Code	A	B	H	Ballnit C [®]	Hardness
PF.064200	6	12	7	◆	52 ± 2 HRC.
PF.0642WB	6	12	7		58 ± 2 HRC.
PF.084200	8	14	9	◆	52 ± 2 HRC.
PF.0842WB	8	14	9		58 ± 2 HRC.
PF.104200	10	16	11	◆	52 ± 2 HRC.
PF.1042WB	10	16	11		58 ± 2 HRC.
PF.124200	12	18	13	◆	52 ± 2 HRC.
PF.1242WB	12	18	13		58 ± 2 HRC.

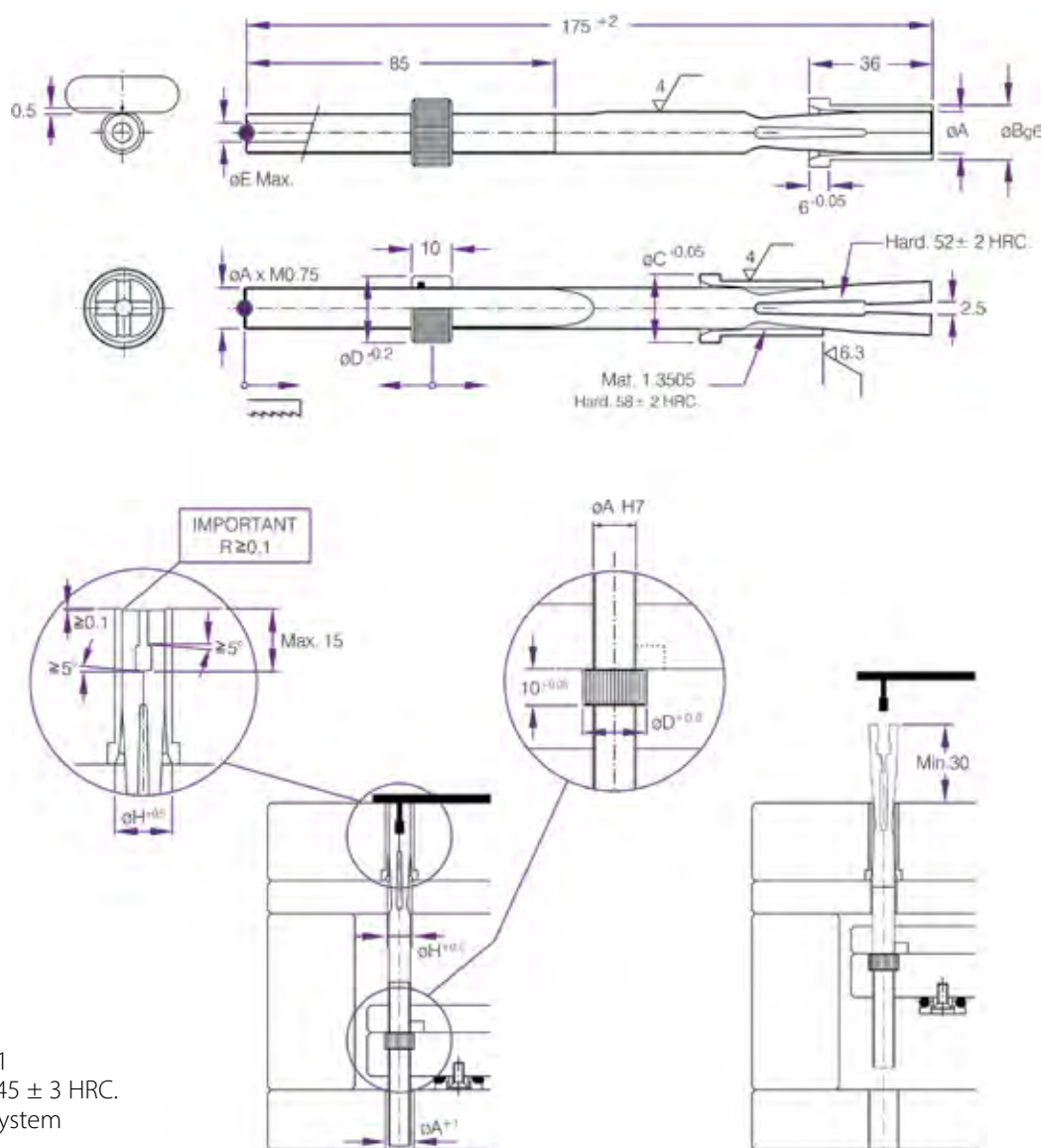


Mat.: 1.2101
Hardened 45 ± 3 HRC.
Patented System

Two separate movements in one component.
Simple and easy to install. Minimum space
required for installation, only needs the space
of an ejector. No milling, grinding or hardening
other than the machining of detail needed. No
need for complex mechanical systems.

Special lengths of 275 and 350mm upon request.

Product Code	A	B	C	D	E	G	H
ED.068200	6	12	14	10	14	6	10
ED.088200	8	14	16	12	16	8	12
ED.108200	10	16	18	14	18	8	14
ED.128200	12	16	18	16	20	8	15



Mat.: 1.2101
Hardened 45 ± 3 HRC.
Patented System

Four separate movements in one component.
Minimum space required for installation, only
needs the space of an ejector. No milling,
grinding or hardening other than the machining
of detail needed. Cylindrical machining and
made 90° regarding the parting line.

Special lengths of 250 and 325mm upon request

Product Code	A	B	C	D	E	H
EE.060175	6	10	12	12	-	9
EE.082175	8	12	14	14	2	11
EE.103175	10	14	16	16	3	13
EE.124175	12	16	18	18	4	15

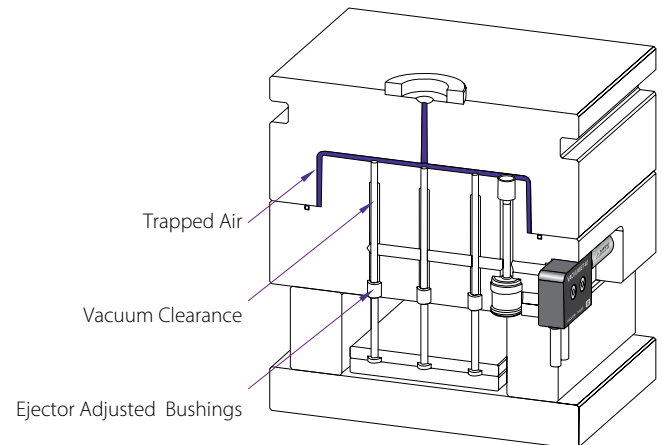


Mould Closed

With the mould closed, air is trapped inside the cavity. If injection starts, the air will be cornered, heated and compressed by the plastic, producing poor quality plastic parts. We have to create a Vacuum!

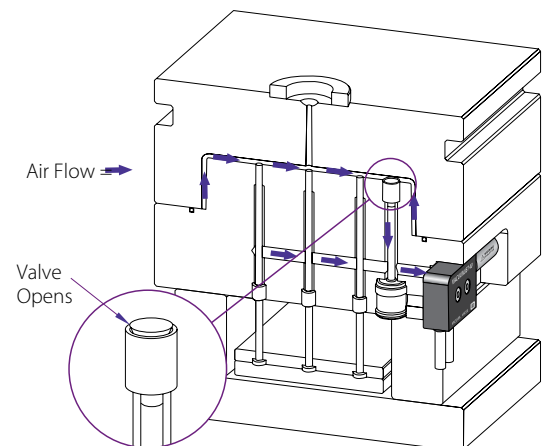
Creating Vacuum In The Cavity

To optimize the injection process we have to take out the air from the cavity. There are several methods to accomplish this, but in all of them it is the injected plastic that pushes out the air. With VACUUMJET, when it is activated prior to the injection, a valve is opened and vacuums the air, therefore, leaving the cavity prepared for the injection.



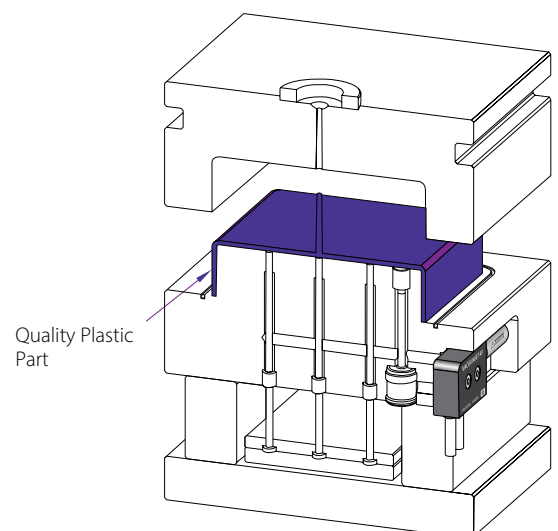
Injection Starts

The Vacuumjet continues sucking the air during all the injection process, to guarantee the maximum ease of the plastics fluidity, therefore reducing the pressure needed.



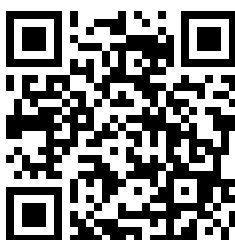
Ejection Process

When the injection is finished, the Vacuumjet stops, and as with all the moulds, the plastic is cooled and the part is ejected...but with the Vacuumjet system, we obtain greater quality plastic part, with at least the same injection, if not faster, and without altering the optimal injection parameters.



For more information about the Vacuumjet product, head to the Cumsa Website: www.cumsa.com

Scan this QR code:



**V250CE Compact Block Hydraulic Cylinder**

The V250CE cylinders have been specially designed for being extremely compact and for applying the integrated end stroke magnetic switches. Furthermore their construction permits a high standardization with consequent lower price and immediate delivery time. Available bores: from 25 to 100 mm. Strokes 20, 50 and 80 mm. Depending on the bore. These cylinders are ideal for short stroke slides and cores on plastic injection moulds. The use for heavy duties is not recommended.

Technical Features:

Max. working pressure: up to 250 bar (3625 PSI)
 Bore Size: 25 to 100 mm
 Rod Size: 18 to 45 mm
 Max. working temperature :
 Magnetic version: 80°C - 176°F
 Non-Magnetic version: 100°C - 212°F
 Stroke : 20, 50 and 80 mm (according to the bore size)

**V215CR Tie Rod Hydraulic Cylinder**

The cylinders of V215CR range are built according to ISO 6020/2 Compact Norms and they are changeable with other similar cylinders (with reserve; personally verify all dimensions) This model permits a wide range of applications with the best compromise between quality and price where not particular requirements about pressure, temperature, dimensions are requested. Till bore 160 magnetic switches can be applied (with a proper version).

Technical Features:

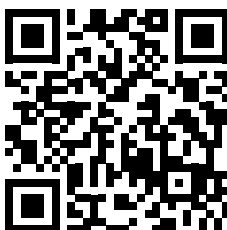
Max. working pressure: up to 215 bar (3117 PSI)
 Bore Size: 25 to 200 mm
 Rod Size: 12 to 140 mm
 Max. working temperature :
 Magnetic version: 80°C - 176°F
 Non-Magnetic version: 120°C - 248°F
 Stroke: 20 and 1500 mm (according to the bore size)

**V260CF Self-Locking Rod Hydraulic Cylinder**

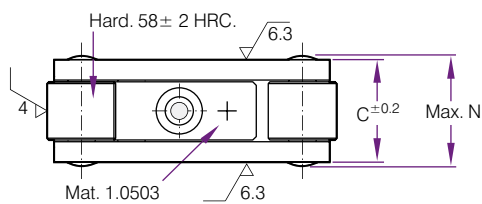
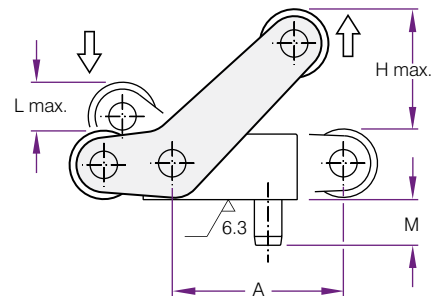
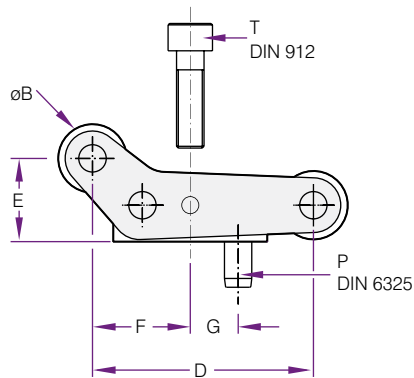
The V260CF are double-acting hydraulic cylinders with a mechanical locking system of the rod in the end stroke position (extended rod), which permits to contrast very high opposite thrusts. Such a solution is widely applicable in the field of plastic injection and die-casting moulds, in order to stand the injection pressure on large moulding surfaces. The rod is hydraulically unlocked automatically when the piston comes back. WARNING: For a correct functioning of the cylinder it's necessary to complete all the times the total available cylinder stroke, both forward and backward, in order to assuring the locking on one side and to avoid hammer-effects on piston-rod screw on the other side. For a firm locking it is necessary to keep the oil in pressure, when pushing, at a minimum of 120 bar-1740 PSI.- Pay great attention to the traction force, which is considerably lower than the thrust.

Technical Features:

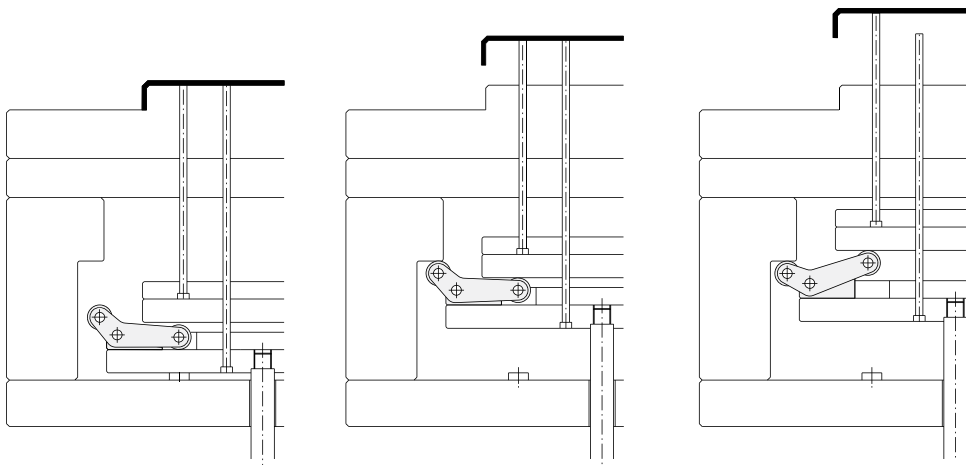
Max. working pressure: up to 260 bar (3770 PSI)
 Bore Size: 30 to 84 mm
 Rod Size: 20 to 60 mm
 Max. working temperature :
 Magnetic version: 80°C - 176°F
 Non-Magnetic version: 160°C - 320°F
 Stroke: 30 and 150 mm (according to the bore size)



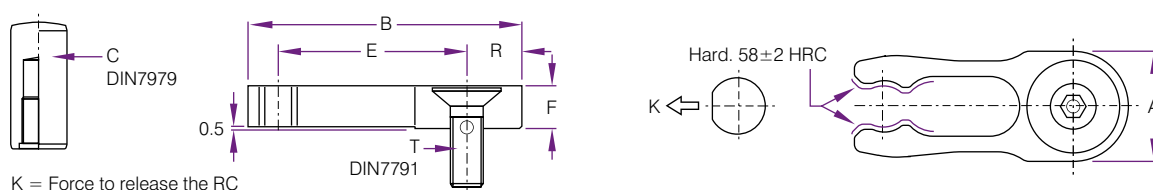
**Scan the QR code for more information about
 VEGA Hydraulic Cylinders**



Simple mechanical double ejection system.
Minimum space required for installation.
Avoids complex systems like others currently
available in the market. Offers a standard
solution to the moulder.



Product Code	A	B	C	D	E	F	G	H max.	L max.	M	N	P	T	Max. Force
EP.200813	20	8	13.2	25.8	9.4	11.4	6	13.6	5.5	5	15	Ø2.5 x10	M3x12	75 kg.
EP.251016	25	10	16	32.3	11.8	14.3	7	17	6.8	6	18.5	Ø3 x12	M4x16	125 kg
EP.371522	37.5	15	22	48.5	17.7	21.5	10.5	25.5	10.2	8	25	Ø4 x16	M6x25	250 kg
EP.502030	50	20	30	64.6	23.6	28.6	14	34	13.6	10	34	Ø5 x20	M8x30	500 kg



Slide Retainers

Mat.: 1.8159

Hardened 45 ± 3 HRC. Patented System

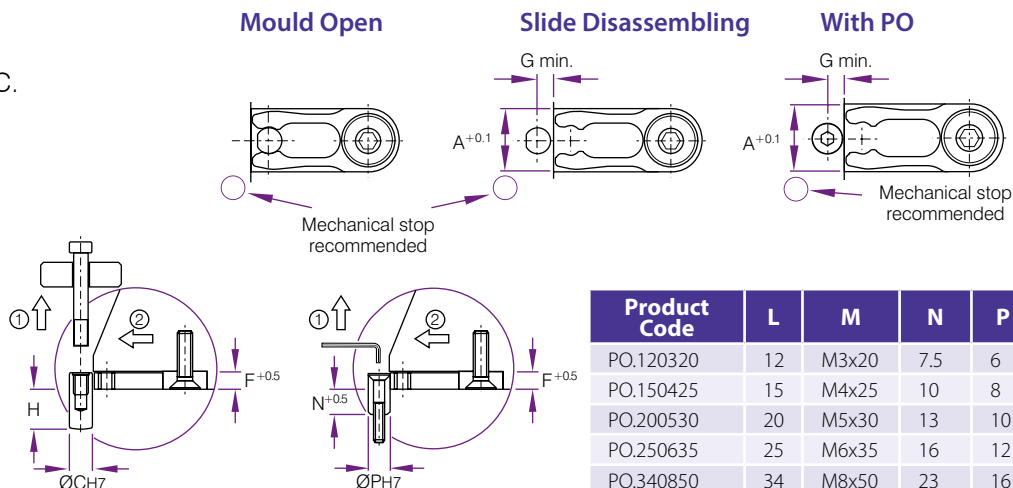
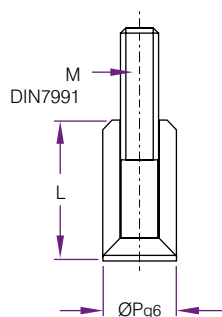
Less machining for installation compared to similar products on the market.
Minimum space required for installation.
Reduces costs in tool downtime.
Offers a standard solution to the moulder.

Product Code	A	B	C	E	F	G	H	K	R	T
RC.123006	12	30	6x20	21	5	4	16	5 kg	6	M5x16
RC.164008	16	40	8x20	28	6	5	15	7 kg	8	M6x25
RC.205010	20	50	10x24	34	8	6	17	14 kg	10	M8x30
RC.246012	24	60	12x32	42	10	7	23	21 kg	12	M10x40
RC.328012	32	80	16x40	56	12	9	27	28 kg	16	M12x50
RC.328016	32	80	16x40	56	16	9	25	38 kg	16	M12x50

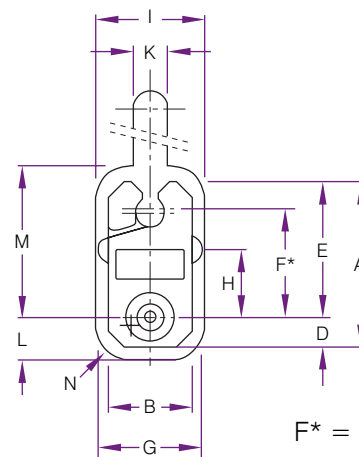
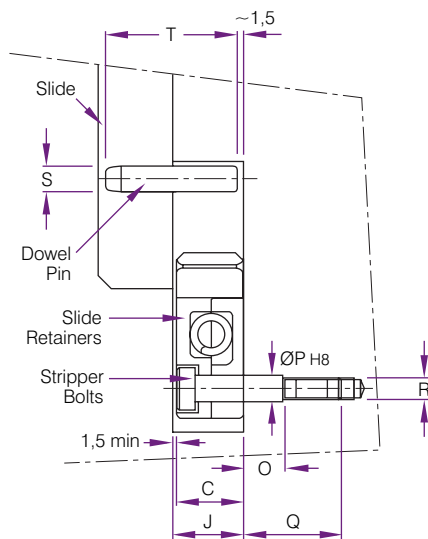


Optional Dowel Pins

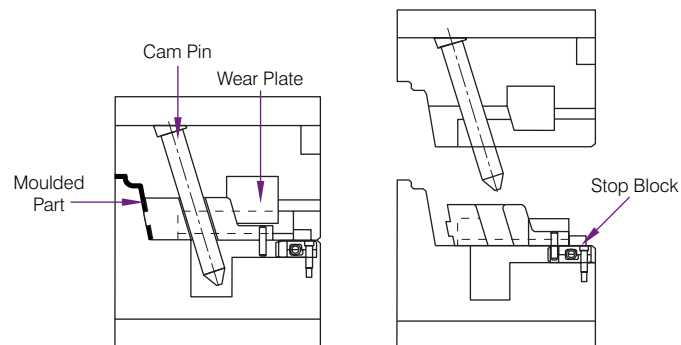
Mat.: 1.3505

Hardened 60 ± 2 HRC.

Product Code	L	M	N	P
PO.120320	12	M3x20	7.5	6
PO.150425	15	M4x25	10	8
PO.200530	20	M5x30	13	10
PO.250635	25	M6x35	16	12
PO.340850	34	M8x50	23	16



The slide retainers are mechanical components that allow the stop and the perfect positioning of mechanical trolley used to free the undercut.



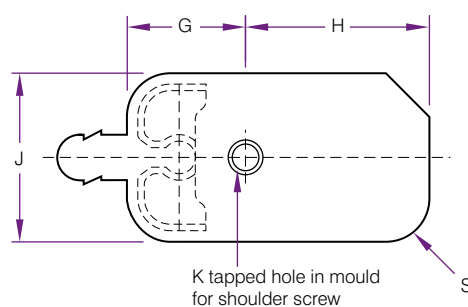
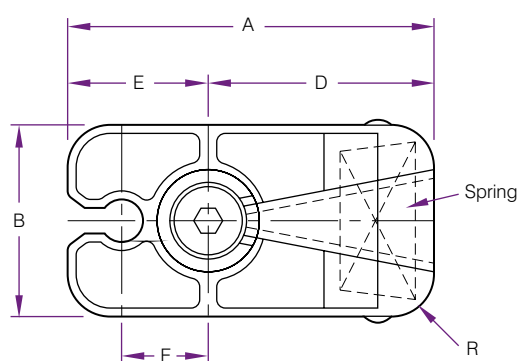
a* = max. slide weight

b* = stripper bolt

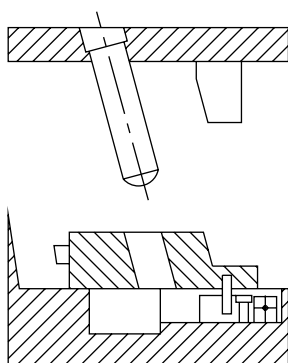
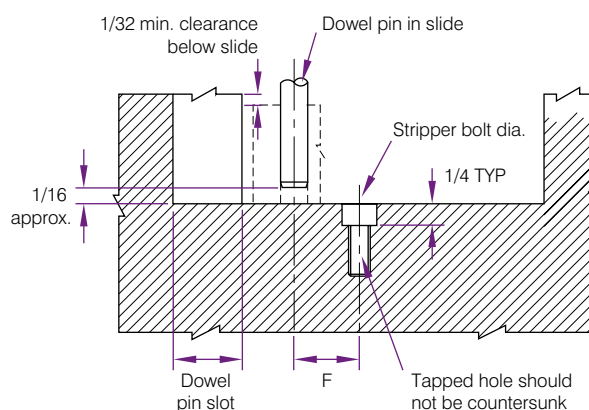
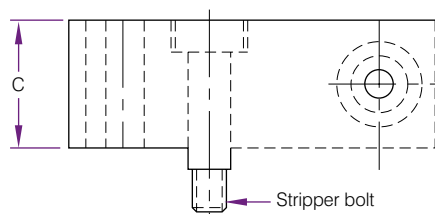
c* = max. opening force in Nm

CAM SLIDE										a*	b*	
Product Code	A	B	C	D	E	F	G	H	I	Newton	Ref.	c*
OESR0001	38	19	16	7	31,5	24,89	24,0	15,5	25,5	150	SB5x20	10
OESR0002	54	32	20	11	43,0	34,93	36,5	22,5	38,0	250	SB6x25	15
OESR0003	86	45	30	19	67,0	53,98	49,5	40,0	51,0	500	SB8x40	20

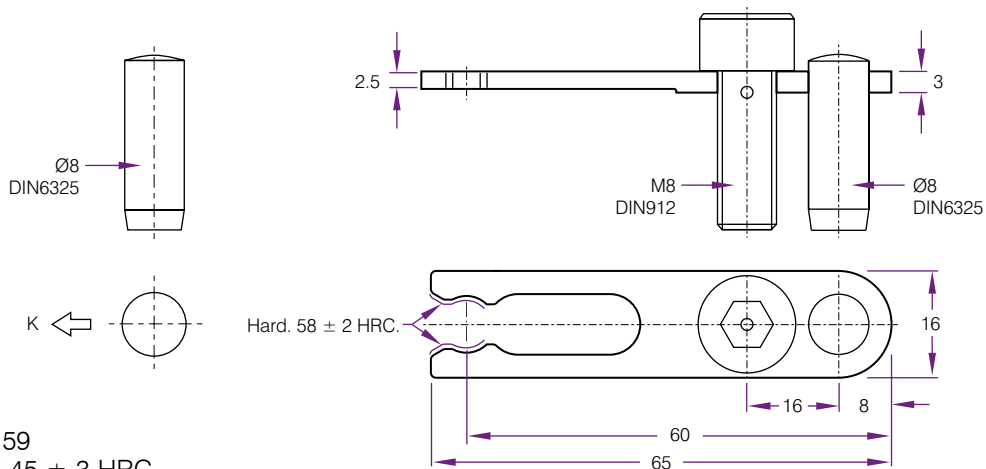
RETAINER SEAT IN MOULD										Dowel Pin	
Product Code	J min	K	L	M	N	O	P	Q	R	S	T
OESR0001	17,5	8	10,0	34,5	8	8,5	6	20	M5	6	32
OESR0002	21,5	10	14,5	46,0	10	10,5	8	25	M6	8	40
OESR0003	31,5	12	22,5	70,0	12	17,0	10	35	M8	10	60



Typical Slide Retainer Application

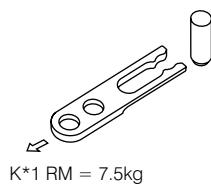


DIMENSIONS							R	Stop	Stop	Max Slide					
Product Code	A	B	C	D	E	F	Rad	Pin	Pin L	Weight	G	H	J	K	S
MRT - 10M	38	19	16	22	16	9.15	5	6	30	10kg	19	26	25	5x8.8x10	8
MRT - 20M	54	32	20	33	21	12.70	6	8	40	20kg	24	36	38	6x1.0x12	10
MRT - 40M	86	45	30	53	33	20.30	10	10	60	40kg	36	56	51	8x1.25x14	13

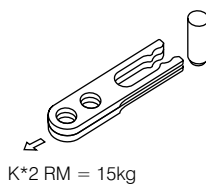


Mat.: 1.8159
Hardened 45 ± 3 HRC.
Patented System

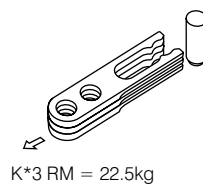
No pocket machining required as needed with other similar products on the market. Minimum space required for installation. Reduces costs compared to conventional mechanisms. Offers a standard solution to the moulder.



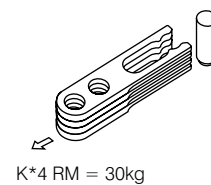
K*1 RM = 7.5kg



K*2 RM = 15kg

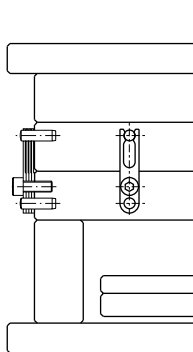


K*3 RM = 22.5kg

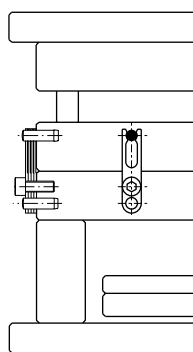


K*4 RM = 30kg

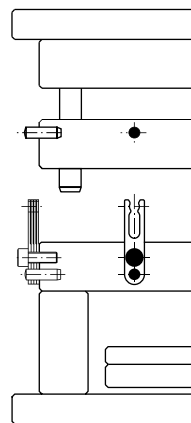
IMPORTANT
K = Approximate resistance value that can be obtained by grouping clips



Closed Mould



1st Opening

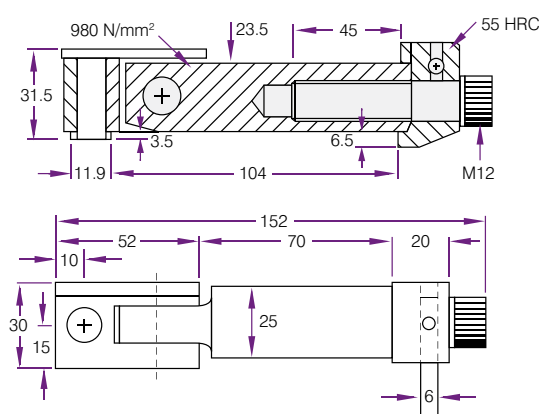


2nd Opening

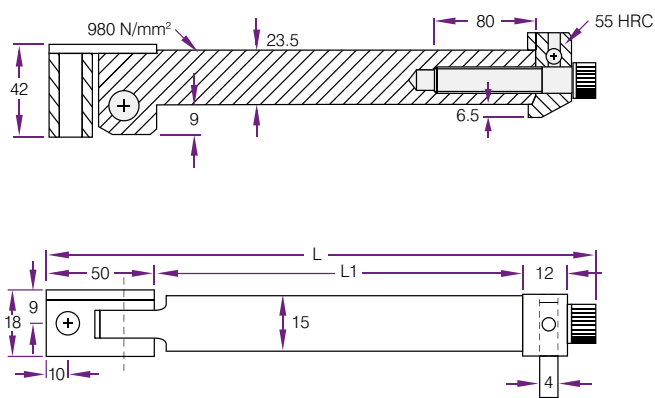
Product Code	K
RM.651608	7.5 Kg.



Latch

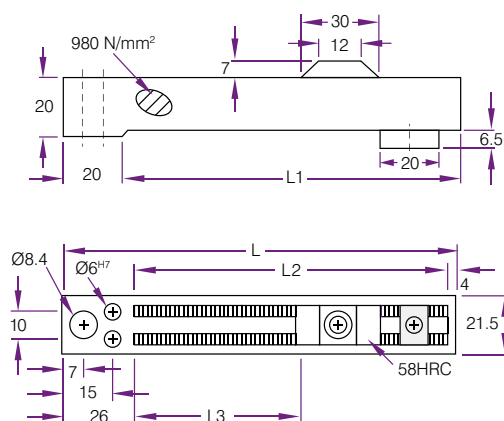


Type	Series
1	ZH 90/1



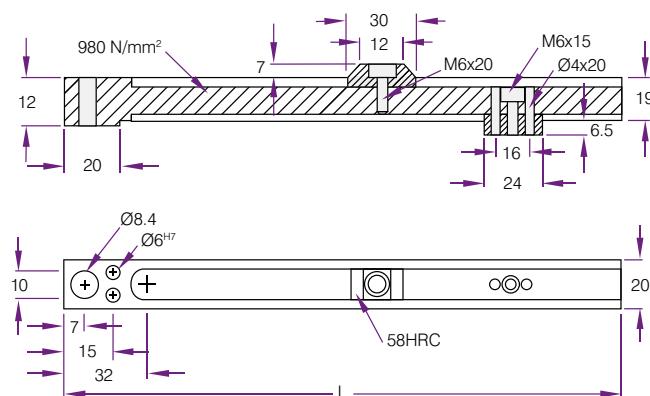
Type	Series	L	L1
2	ZH 90/2	252	170
3	ZH 90/3	302	220
4	ZH 90/4	352	270
1 BIS	ZH 90/1 BIS	172	90

Adjustable Cam



Type	Series	L	L1	L2	L3 MAX
01	ZH 90/01	140	120	110	60
02	ZH 90/02	204	184	174	124
06	ZH 90/06	250	230	220	170

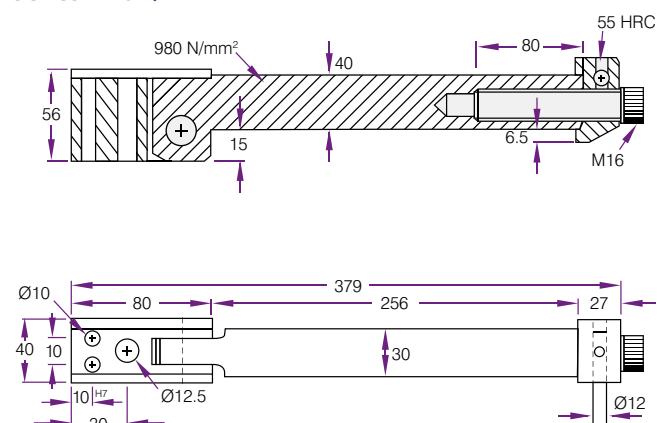
Fixed Cam



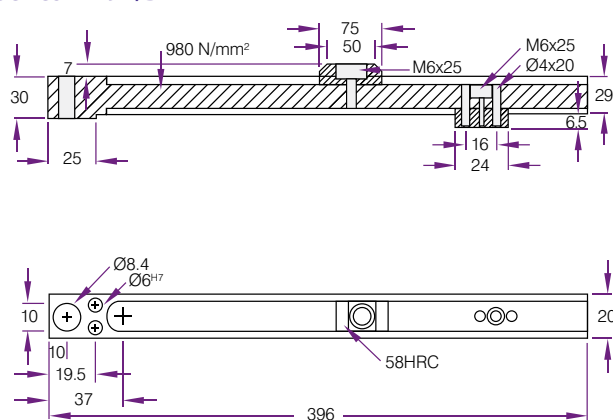
Type	Series	L
03	ZH 90/03	200
04	ZH 90/04	250
05	ZH 90/05	300



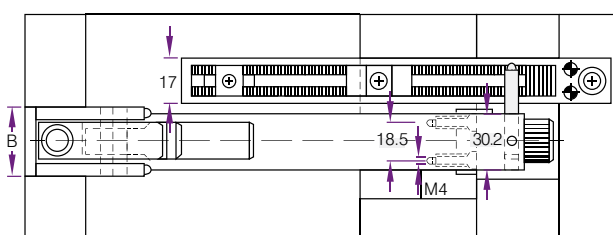
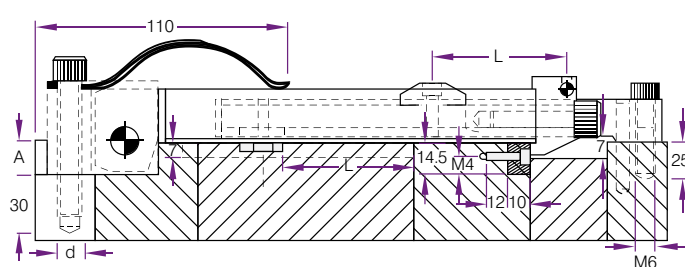
Series ZH 91/A



Series ZH 91/B



Standard Sets



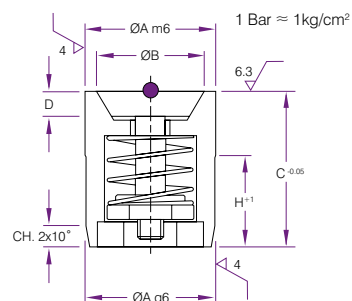
Type	Fixed Sets	
Box 200 FIX	Qty 2	ZH 90/2
	Qty 2	ZH 90/03
Box 250 FIX	Qty 2	ZH 90/3
	Qty 2	ZH 90/04
Box 300 FIX	Qty 2	ZH 90/4
	Qty 2	ZH 90/05
Box 400 FIX	Qty 2	ZH 90/A
	Qty 2	ZH 90/B

Type	Adjustable Sets	
Box 140 R	Qty 2	ZH 90/1
	Qty 2	ZH 90/01
Box 200 R	Qty 2	ZH 90/2
	Qty 2	ZH 90/02
Box 250 R	Qty 2	ZH 90/3
	Qty 2	ZH 90/6
Box 140 R	Qty 2	ZH 90/1 BIS
	Qty 2	ZH 90/01



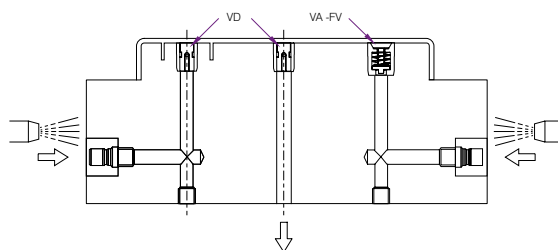
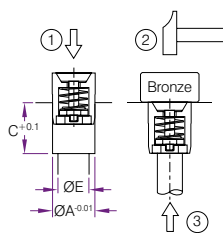
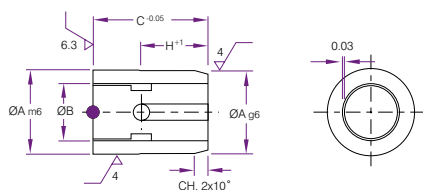
Material: INOX. 1.4034
 Hardened 51 ± 3 HRC.
 Working pressure: 1.5-6 BARS.

Helps part ejection with air.



Product Code	A	B	C	D	E	H
VA050412	5	3	12	1.5	4	7
VA065212	6	5.2	12	1.5	4	7
VA086512	8	6.5	12	1.5	4	7
VA100812	10	8	12	2	8	7
VA121012	12	10	12	2.5	10	7
VA161320	16	13	20	3	12	12
VA201720	20	17	20	3.5	16	12

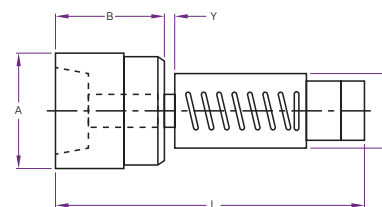
Valve - Double



Product Code	A	B	C	E	H
VD080512	8	5	12	4	7
VD100612	10	6	12	5	7
VD120812	12	8	12	7	7
VD161020	16	10	20	9	12

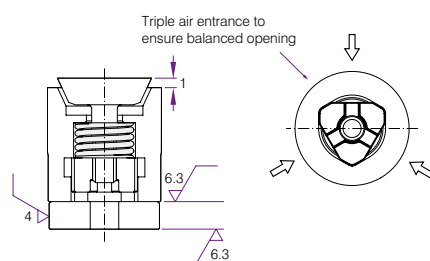
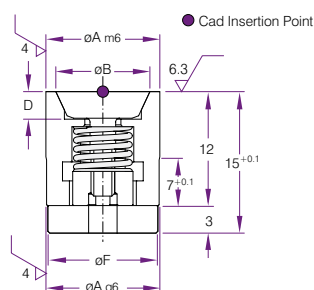


High Pressure Air Valve
Stainless spring designed for fast cycles
Max temperature 130°C

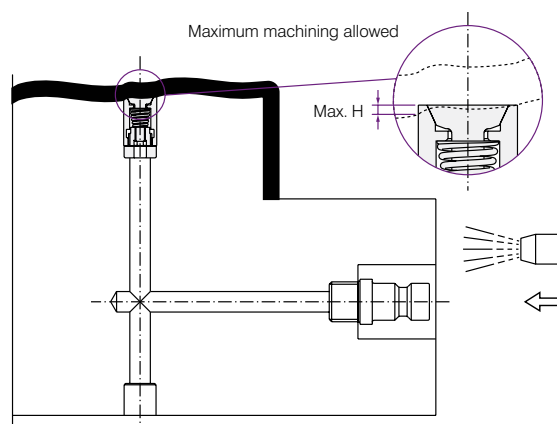
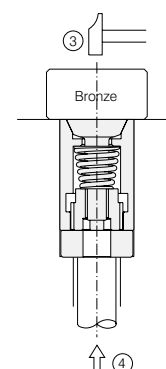
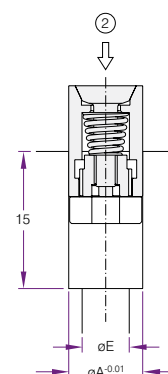
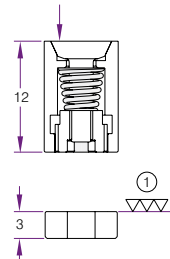


Product Code	A	B	C	L	Y
OIVA01N	8	11	6	24	1,0
OIVA02N	12	18	8	34	1,0
OIVA03N	18	22	12	45 5	1,0

Air Valve - High Pressure



Maximum Injection
Pressure: 2.500 Kgs/cm²



Product Code	A	B	D	E	F	H
VH.086515	8	6.6	2	5	7.8	0.75
VH.121015	12	9.9	2.9	5	11.8	1



Materials: Stainless Steel

Hardness: 50-55 HRC.

Outer Insert



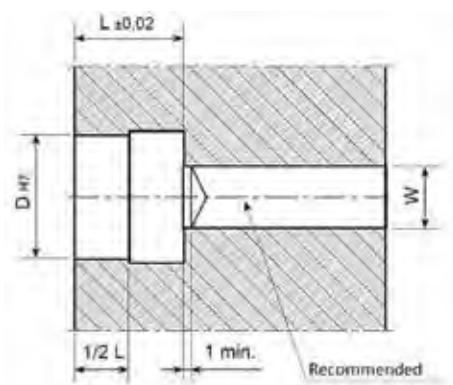
Inner Insert



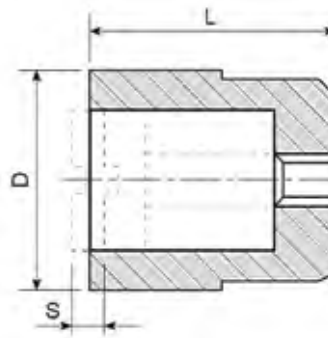
ØD	Month	Year	Day	Blank
4	CCM04	CCA0420AA	CCG04*	CCN04
5	CCM05	CCA0520AA	CCG05*	CCN05
6	CCM06	CCA0620AA	CCG06	CCN06
8	CCM08	CCA0820AA	CCG08	CCN08
10	CCM10	CCA1020AA	CCG10	CCN10
12	CCM12	CCA1220AA	CCG12	CCN12
16	CCM16	CCA1620AA	CCG16	CCN16
20	CCM20	CCA2020AA	CCG20	CCN20

ØD	Year + Arrow	Arrow
4	ICA0420AA	ICN04
5	ICA0620AA**	ICN06**
6	ICA0620AA	ICN06
8	ICA0820AA	ICN08
10	ICA1020AA	ICN10
12	ICA1220AA	ICN12
16	ICA1620AA	ICN16
20	ICA2020AA	ICN20

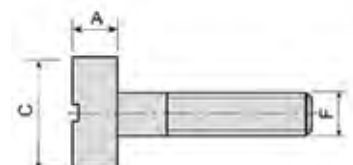
Installation



Outer Insert



Inner Insert

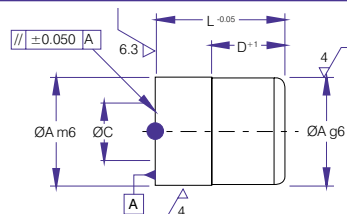


ØD	L	S	ØW	A	ØC	F
4	8***	0.25	1.4	2	2.2	M1X0.25
5	8	0.20	2	2	3.1	M1.6X0.2
6	8	0.20	2	2	3.1	M1.6X0.2
8	10	0.25	3	2.5	4.4	M2.3X0.25
10	12	0.35	3	3	5.2	M2.5X0.35
12	14	0.35	4	3	6.2	M3X0.35
16	14	0.35	5	3.5	8.2	M4X0.35
20	16	0.35	5	4.5	11	M4X0.35

* CCG04 & CCG05 have numbers only.

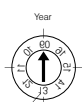
** Inner insert dia.6 valid also for outer insert dia. 5.

*** Special date stamps with D=4mm and L=5mm and inner insert with C=2.1 available on request.



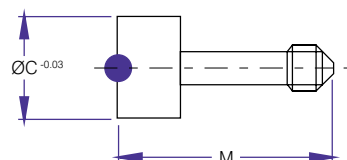
Materials: INOX. 1.4034
Hardness: 51 ± 3 HRC.
Max. working temp 150°C Patented System

Inner insert is always at the same level as the body of the date stamp. Wide range of diameters. Only a H7 pocket required for assembly. No downtime when changing inserts. Internal mechanism guarantees secure replacement of inserts.



12 Months	12 Month + Year	Year	Blank	A	C	D	E	L	N
FA0422SF	FA042212-...	FA042204-...	FA042200	4	2.2	6	3.5	12	4
FA0530SF	FA053012-...	FA053004-...	FA053000	5	3	6	3.5	12	4
FA0632SF	FA063212-...	FA063205-...	FA063200	6	3.2	12	4	20	5
FA0847SF	FA084712-...	FA084705-...	FA084700	8	4.7	12	6	20	5
FA1057SF	FA105712-...	FA105706-...	FA105700	10	5.7	12	8	20	6
FA1267SF	FA126712-...	FA126708-...	FA126700	12	6.7	12	10	20	8
FA1687SF	FA168712-...	FA168710-...	FA168700	16	8.7	12	12	20	10
FA2007SF	FA200712-...	FA200710-...	FA200700	20	10.7	12	14	20	10

Date Stamp Inserts

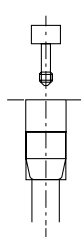
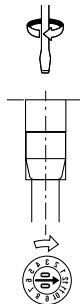
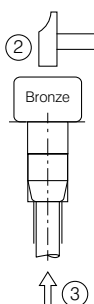
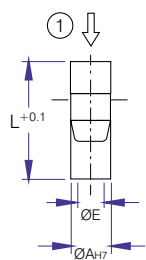
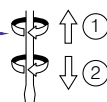


Material: INOX. 1.4034
Hardness: 51 ± 3 HRC.

Year + Arrow



IMPORTANT
When replacing the insert, be sure to tighten until hearing the engagement "click".



Arrow Only



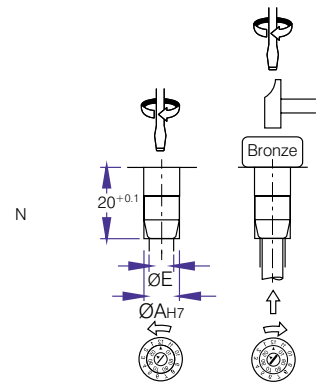
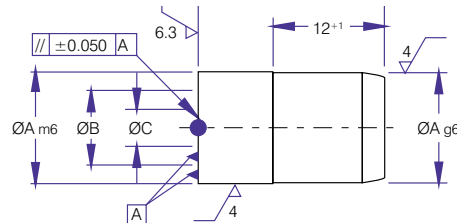
Year and Arrow		
Product Code	C	M
IA2275 ..	2.2	7.5
IA3075 ..	3	7.5
IA3217 ..	3.2	17
IA4717 ..	4.7	17
IA5717 ..	5.7	17
IA6717 ..	6.7	17
IA8717 ..	8.7	17
IA1007 ..	10.7	17

Arrow Only		
Product Code	C	M
IA2275SF	2.2	7.5
IA3075SF	3	7.5
IA3217SF	3.2	17
IA4717SF	4.7	17
IA5717SF	5.7	17
IA6717SF	6.7	17
IA8717SF	8.7	17
IA1007SF	10.7	17



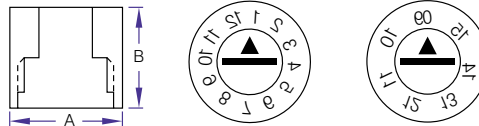
Materials: INOX. 1.4034
Hardness: 51 ± 3 HRC.
Maximum working temperature 100°C.
Patented System

Replaces the need for 2 separate date stamps. No need to machine 2 separate holes. Minimum space required for installation.



12 Month. + Yr	Blank	A	B	C	E	N
FD080512-..	FD080500	8	5.5	3	6	5
FD120812-..	FD120800	12	8	4	10	6
FD161012-..	FD161000	16	10.5	5.3	12	10

Mould Identification Month/Year Inserts



A = Diameter/Tolerance = +.00
-.02

B = Length/Tolerance = ± .03

DIA	A	B
DY-08	Dia 8.00	10.00
DY-10	Dia 10.00	10.00
DY-12	Dia 12.00	12.00
DY-16	Dia 16.00	14.00

DIA	A	B
DM-08	Dia 8.00	10.00
DM-10	Dia 10.00	10.00
DM-12	Dia 12.00	12.00
DM-16	Dia 16.00	14.00

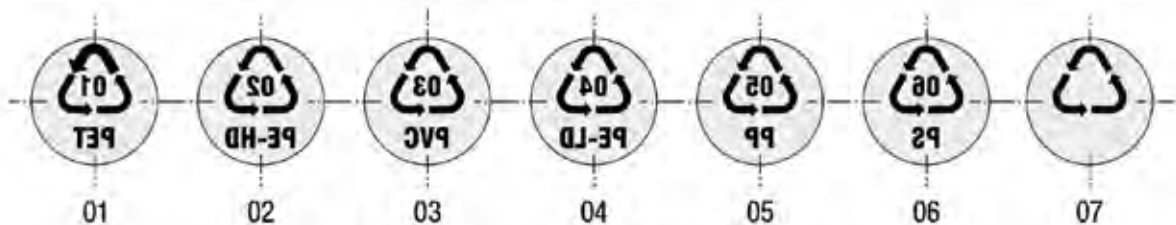
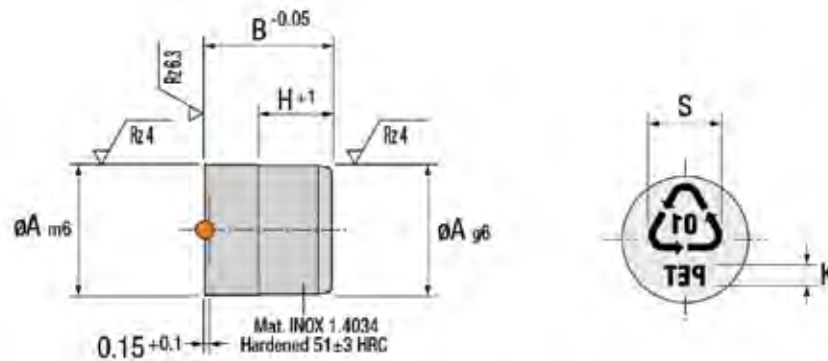


Materials: INOX. 1.4034

Hardness: 51 ± HRC.

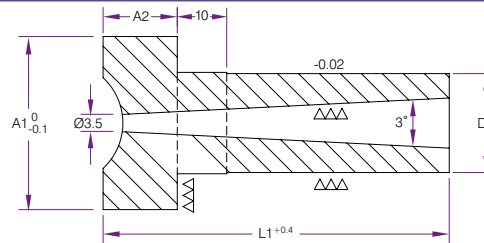
Assembly is from the front of the mould

 Cad Insertion Point



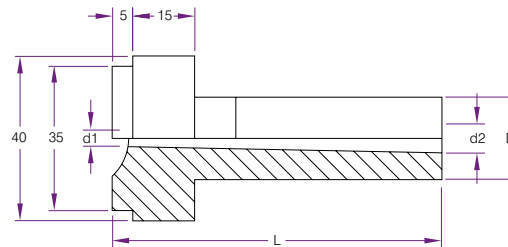
Product Code	A	B	E	H	K	S
IR1012-**-	10	12	8	7	1.5	5.6
IR1212-**-	12	12	10	7	1.8	6.8
IR1616-**-	16	16	12	9	2.4	9
IR2016-**-	20	16	16	9	3.2	11.5

**Indicate model number after the product code



Product Code	A1	D1	L1	A2	Radius
CS6	25	16	60	15	3/4
CS8	25	16	80	15	3/4
BM6	35	20	60	15	3/4
BM7	35	20	70	15	3/4
BM8	35	20	80	15	3/4
BM9	35	20	90	15	3/4
BM10	35	20	100	15	3/4

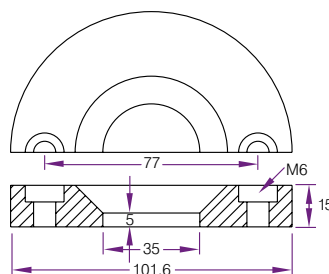
Sprues - Finished



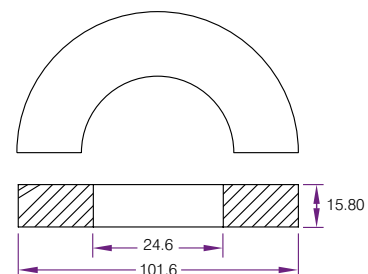
Material: S45C

Product Code	D	L	d1	d2	Radius
SB166	16	60	3.5	5.6	3/4
SB168	16	80	3.5	6.5	3/4
SB206	20	60	3.5	5.6	3/4
SB208	20	80	4	7	3/4
SB201	20	100	4	10	3/4

Location Rings



Finished Location Ring



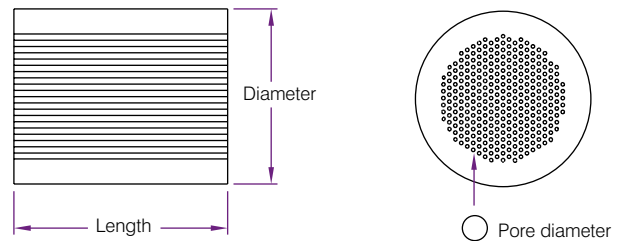
Blank Location Ring

Product Code	Description	Material
LRF	Finished Location Ring	S45C
LRB	Blank Location Ring	S45C



Blowmould, Diecast and Vacuum Casting

Pore Diameter: 0.30mm

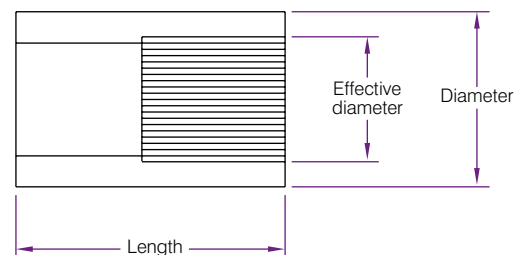


For Blow Moulding, Diecasting Or Vacuum Casting

Product Code	30510	30610	30615	30810	30815	31010	31015	31210	31215	31415
Diameter	5	6	6	8	8	10	10	12	12	14
Number of Pores	89	89	89	200	200	340	340	340	340	550
Length	10	10	15	10	15	10	15	10	15	15

Plastic Injection Moulding

Pore Diameter: 0.03 ~ 0.10mm



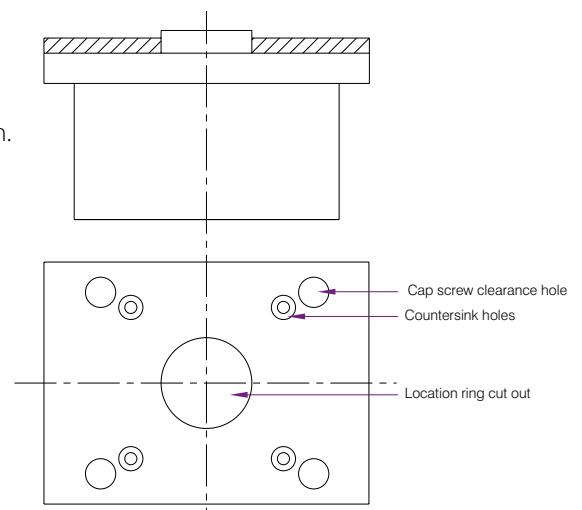
For Plastic Injection Moulding

Product Code	SV030410	SV030610	SV030810	SV031010	SV050610	SV050810	SV051010	SV100810	SV101010
Outer Diameter	4	6	8	10	6	8	10	8	10
Effective Diameter	2.5	2.5	2.5	2.5	3.5	3.5	3.5	5.5	5.5
Number of Pores	880	880	880	880	880	880	880	880	880
Length	10	10	10	10	10	10	10	10	10

Insulation Sheet



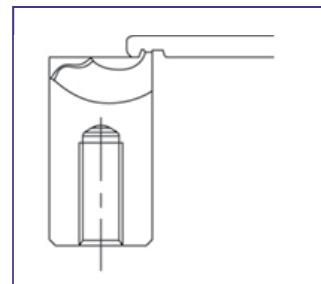
- Machined to suit your application.
- Polyester glass laminate.
- Low thermal conductivity continuous to 220C.
- Standard sheet also available.
- 0.8-50mm thick available.





Standard Tunnel Gate Inserts Version S1 - With Machining Allowance

- With machining allowance on upper surface
- Available in round (TGR) and square versions (TGS)
- Available in 2 degrees of hardness (40 HRC/ 60 HRC)
- Highly wear-resistant hot worked steel M2 (1.3343)

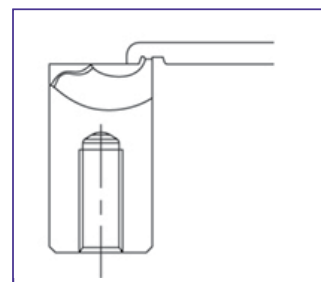


Tunnel Gate Insert - Version S2



Standard Tunnel Gate Inserts Version S2 - With Vestige

- For flat parting surfaces, including vestige with integrated cutting edge
- Available in round (TGR) and square (TGS) versions
- Available in 2 degrees of hardness (40HRC/ 60 HRC)
- Highly wear-resistant hot worked steel M2 (1.3343)

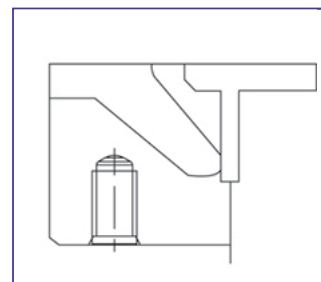


Tunnel Gate Insert - Version TPS



Straight Standard Sub-Gate Inserts Version TPS - For Side Gating

- Straight standard sub-gate for side gating
- Integrated dead-end recess reduces loss of pressure and shear stress
- Highly wear resistant hot working steel M2 (1.3343) - 54+2 HRC

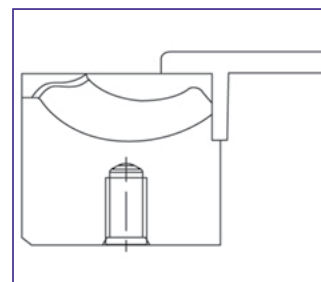


Tunnel Gate Insert - Version SGC



Contourable Tunnel Gate Inserts Version SGC - For Side Gating

- Curved tunnel permits gating deep inside the part
- Integrated dead-end recess reduces loss of pressure and shear stress.
- Highly wear-resistant hot worked steel M2 (1.3343) -54+2HRC

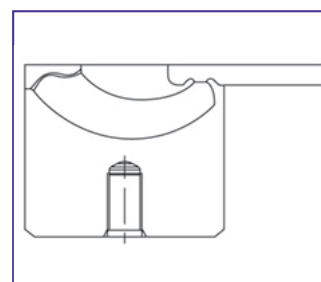


Tunnel Gate Insert - Version TGC



Contourable Tunnel Gate Inserts Version TGC - With Machining Allowance

- With machining allowance on upper surface
- Available in round (TGR) and square versions (TGS)
- Available in 2 degrees of hardness (40 HRC/ 60 HRC)
- Highly wear-resistant hot worked steel M2 (1.3343)



Nozzle Range and Series Options

Key	Suitability
✓	Available / Suitable
⊙	Application dependant
✗	Not available / Not suitable

Nozzle Range			Nozzle Series					Valve Gate	Front Loading	Single Nozzle
			09	13	16	19	27			
MX		Front loading heater for Manifold Only Close cavity pitching	✓	✓	✓	✓	✗	✓	✓	✗
BX		Cost effective solution Robust heater design Single & manifold application	✗	✓	✓	✓	✓	✓	✗	⊙
SX		Dedicated single nozzle solution Two heaters for optimum control	✗	✓	✓	✓	✓	✗	✗	✓

mastip[™]
hot runner solutions

Enquire with our technical advisor to ensure correct nozzle choice

Tip and Nut Options

Key	Tip Suitability
✓	Available
★★★★	Highest rating
×	Not Available

1 Not Available in X13

3 Not Available in SX Series

2 Not Available in X27

4 Not Available in H5

TIPS		Grades			Nut Style			Features			Plastic (Refer to page 22)		
		G1	G2	G5	ONT	BN / BE V1B / V2B	SN/V1S SX/(Y)CN SL	Gate Quality	Flow Rate	Flow Marks	Easy	Medium	Difficult
Thermal Gate	TT Multi Hole Torpedo Tip	✓	✓	✓				★★★★	★★	★★	★★★★	★★★★	★★★★
	TT+5 Extended Torpedo Tip	✓	✓	×		×	×	★★★★	★★	★★	★★★★	★★	×
	TT+10 Extended Torpedo Tip	✓	✓	×		×	×	★★★★	★	★★	★★★★	★	×
	IT Single Hole Torpedo Tip	✓	✓	✓				★★★★	★★	★★★	★★★★	★★★★	★★★★
	IT+5 Extended Torpedo Tip	✓	✓	×		×	×	★★★★	★★	★★★	★★★★	★★	×
	IT+10 Extended Torpedo Tip	✓	✓	×		×	×	★★★★	★	★★★	★★★★	★	×
	OT Open Tip	✓	×	✓				★★	★★★★	★★★★	★★★★	★★★★	★
	Y No Tip	×	×	×	×	×		★	★★★★	★★★★	★★★★	★★★★	★★★★
	Multi-Gate (A) Axial Tip	✓	×	×		×	×	★★★★	★★	★★	★★★★	×	×
Valve Gate	Multi-Gate (S) Side Tip	✓	×	×		×	×	★★	★★	★★	★★★★	×	×
	TV Torpedo Tip	✓	×	×				★★★★	★★★★	★★	★★★★	★★★★	★
	OV Open Tip	✓	×	✓				★★★★	★★★★	★★★	★★★★	★★★★	★
	GV Guided Tip	×	×	✓			×	★★★★	★★★★	★★★	★★★★	★★★★	★
	YV No Tip	×	×	×	×			★★★★	★★★★	★★★	★★★★	★★★★	★

Enquire with our technical advisor to ensure correct nozzle choice

Typical Flow Length Ratios (L/t)

Material	Wall Section							
	2.0	1.5	1.0	0.8	0.7	0.6	0.5	0.4
ABS	170	96	43	27	21	15	11	7
CA	150	84	38	24	18	14	9	6
EVA	175	98	44	28	21	16	11	7
SAN	120	68	30	19	15	11	8	5
PA	150	84	38	24	18	14	9	6
PC	100	56	25	16	12	9	6	4
HDPE	225	127	56	36	28	20	14	9
LDPE	275	155	69	44	34	25	17	11
PMMA	130	73	33	21	16	12	8	5
POM	150	84	38	24	18	14	9	6
PP	250	141	63	40	31	23	16	10
UPVC	100	56	25	16	12	9	6	4

All flow lengths greater than this must be considered thin wall and the nozzle series selected accordingly.

Nozzle Flow Rates

Use the table below to select the correct nozzle series based on the flow rate required and the material category. If the material is a blend material (for example Medium-Difficult or Easy-Medium) always select the higher category to ensure the part can be filled.

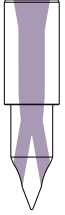
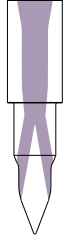
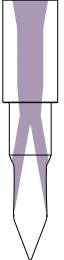
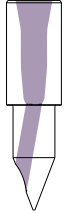
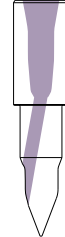
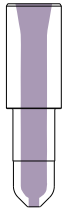
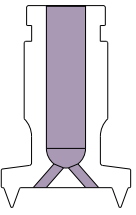
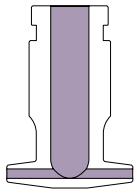
Nozzle Series	Material Specifications			Material Category ²		
				Easy	Medium	Difficult
09	Thermal Gate Flow Rate	g/s	¹	15	7	3
	Shot Weight	g	¹	0.5 - 15	0.5 - 10	0.5 - 5
13	Thermal Gate Flow Rate	g/s	¹	30	15	5
	Valve Gate Flow Rate	g/s	¹	25	12	—
	Shot Weight	g	¹	0.5 - 45	0.5 - 30	0.5 - 15
16	Thermal Gate Flow Rate	g/s	¹	125	65	25
	Valve Gate Flow Rate	g/s	¹	95	50	20
	Shot Weight	g	¹	1 - 200	1 - 125	1 - 60
19	Thermal Gate Flow Rate	g/s	¹	300	150	60
	Valve Gate Flow Rate	g/s	¹	225	110	45
	Shot Weight	g	¹	2 - 625	2 - 300	2 - 150
27	Thermal Gate Flow Rate	g/s	¹	600	300	125
	Valve Gate Flow Rate	g/s	¹	420	210	90
	Shot Weight	g	¹	10 - 2000	10 - 1200	10 - 800

¹ Additives, flow length and thin wall sections all reduce the effective flow rate and shot weight. To counter the reduced flow rate and shot weight select one nozzle series larger.

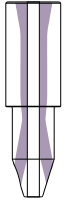
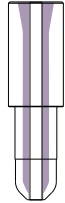
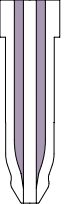
Enquire with our technical advisor to ensure correct nozzle choice

Tip Styles

Thermal Gate Tip Styles

Multi Hole Torpedo Tip (TT)	Extended Torpedo Tip (TT+5)	Extended Torpedo Tip (TT+10)
		
Single Hole Torpedo Tip (IT)	Extended Single Hole Torpedo Tip (IT +5)	Extended Single Hole Torpedo Tip (IT +10)
		
Open Tip (OT)	Spiral Tip (ST)	
		
Multi-Gate Axial Tip (A)	Multi-Gate Side Tip (S)	
		

Valve Gate Tip Styles

Torpedo Tip (TV)	Open Tip (OV)
	
Guided Tip (GV)	
	

Tip Grades

Tips are manufactured in various grades designed for different applications and wear resistance.

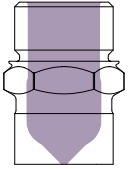
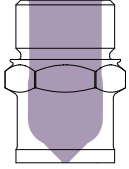
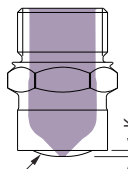
Tip Grade	Recommended use	Manufactured Material	Tip Style Options
G1	Default grade suitable for easy materials	Beryllium Copper with Nickel coating	TT, IT, OT, TV, OV
G2	Long life tip suitable for easy unfilled materials	Beryllium Copper tipped with Steel, Nickel coating	TT, IT
G5	Long life tip suitable for difficult and abrasive materials	Carbide/Hard liner	TT, IT, OT, OV, GV

Enquire with our technical advisor to ensure correct nozzle choice

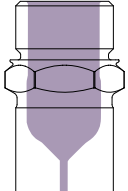
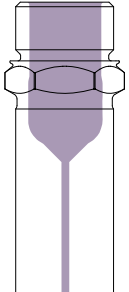
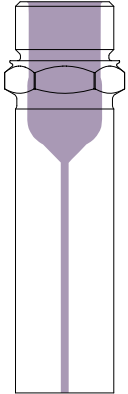
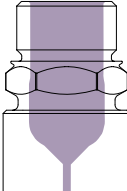
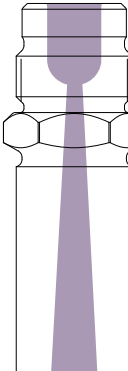
Nut Options

Key	Value
✓	Yes
✗	No
Witness	Nut will leave a circular witness mark on part
Modify	Nut may require modification to suit application

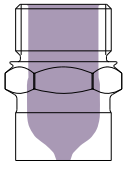
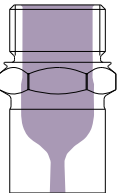
Thermal Gate Nut Types

Bush Nut Full Contact (BE)		Bush Nut (BN)		Dome Nut (BD)	
Witness	✓	Witness	✓	Witness	✓
Modify	✓	Modify	✗	Modify	✓
					

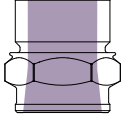
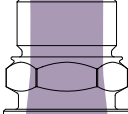
For a Dome Nut supply R1 and K dimensions at time of order.

Sprue Nut +5 (SN)		Sprue Nut +20 (SX)		Sprue Nut +35 (SL)		Retro Sprue Nut (SN-R)		YCN Nut (YCN)	
Witness	✓	Witness	✓	Witness	✓	Witness	✓	Witness	✓
Modify	✓	Modify	✓	Modify	✓	Modify	✓	Modify	✓
									

Valve Gate Nut Types

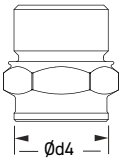
Valve Bush Nut (V1B ¹ /V2B ²)		Valve Sprue Nut (V1S ¹)	
Witness	✓	Witness	✓
Modify	✓	Modify	✓
			

Thermal Gate and Valve Gate Nut Types

Open Nut (ONT)		Retro Nut (ONT-R)	
Witness	✗	Witness	✗
Modify	✗	Modify	✓
			

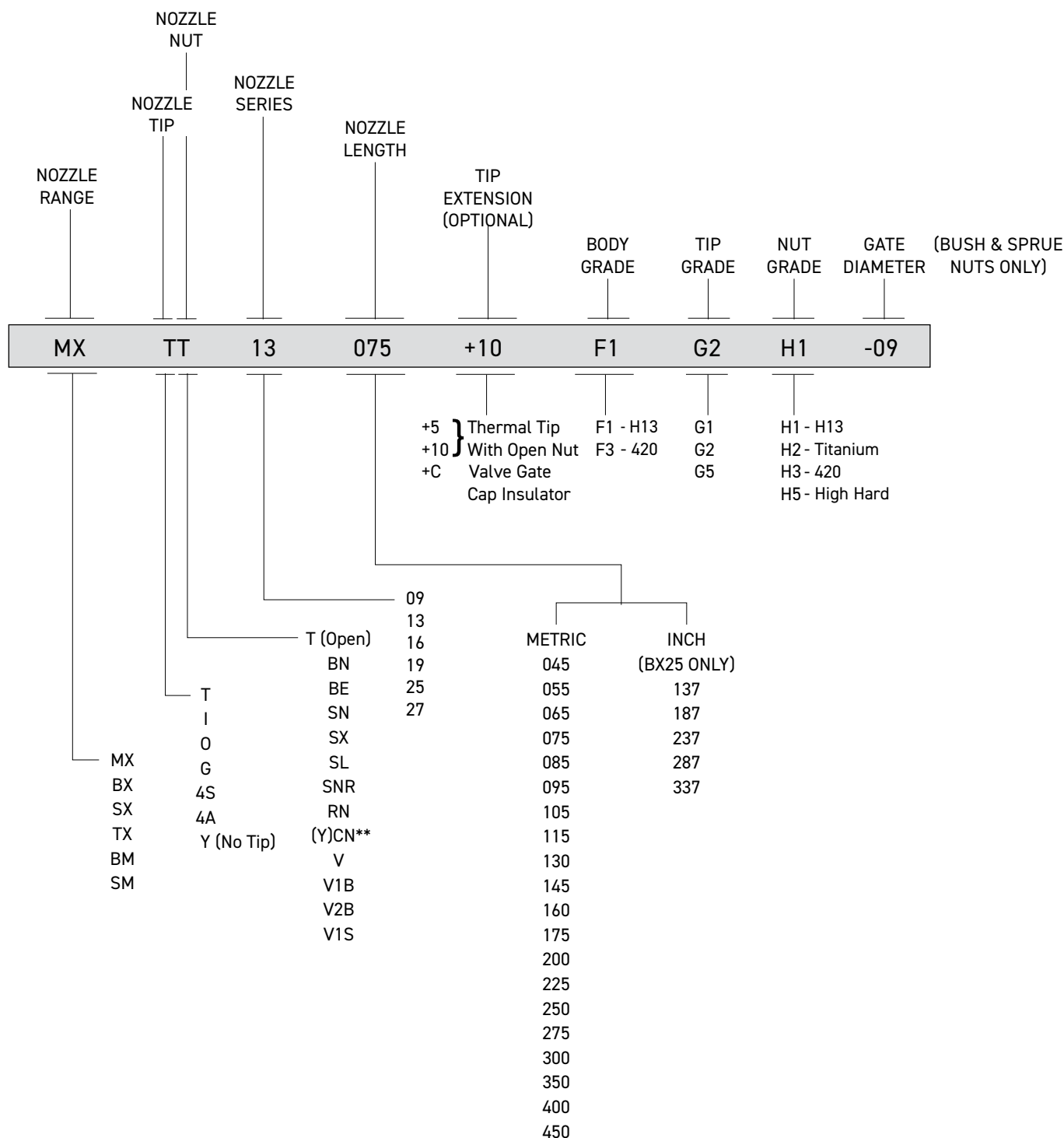
Notes:

- 1 Conical Gate
2 Cylindrical Gate

	Series	Standard Nut Ød4	Retro Nut Ød4*
	09	7	-
	13	10	13.1
	16	12	16.1
	19	15	19.1
	27	23	27.1

* Finish to suit cavity d4 -0.015mm to +/-0.005mm

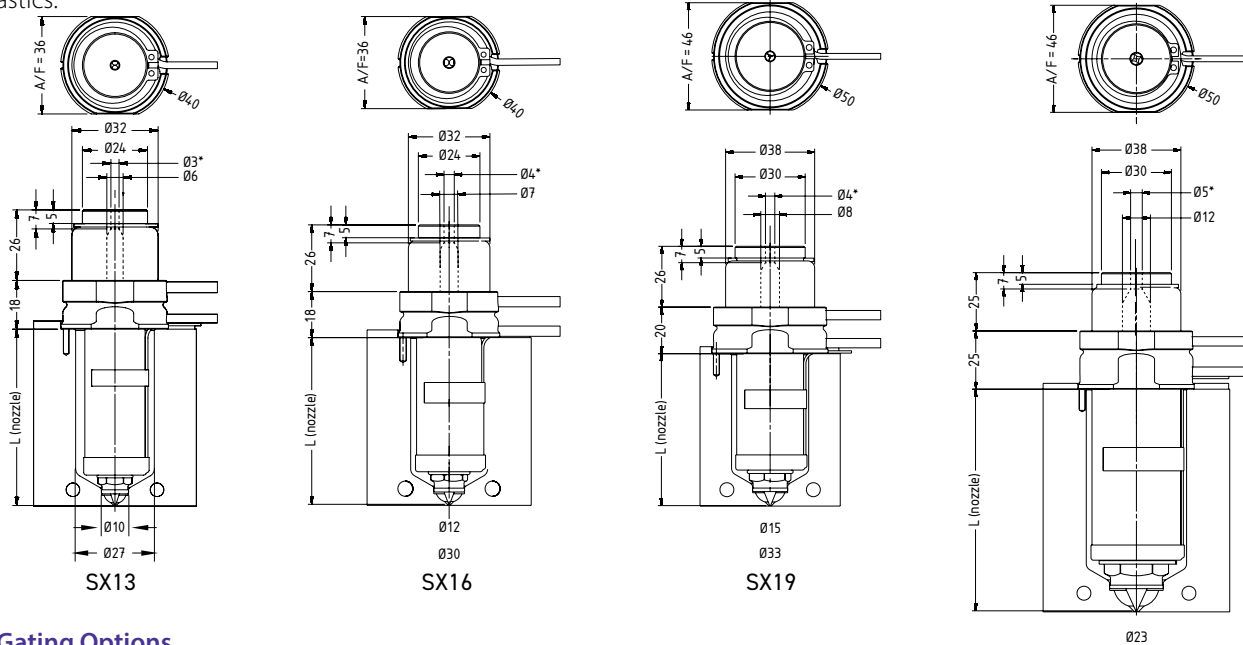
Nozzle Assembly Order Code for X-Range Series



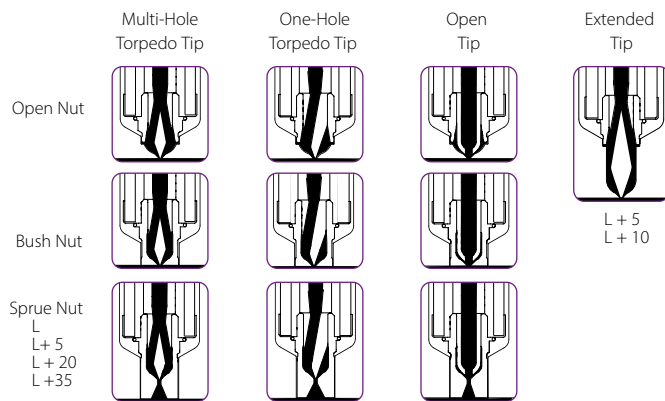
Enquire with our technical advisor to ensure correct nozzle choice



With two heaters the SX nozzle is perfectly suited for all single nozzle applications. Independently controlled heater zones provide uniform temperature distribution along the length of the nozzle, making it ideal to process difficult plastics.



Gating Options



SX27

SX Nozzle Body Lengths**																
L =	45	55	65	75	85	95	105	115	130	145	160	175	200	225	250	275
Series 13	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1*	F1*		
	F3	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*		
Series 16	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1*	F1*	F1*	
	F3	F3	F3	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	
Series 19	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1*	F1*	F1*	F1*
	F3*	F3	F3	F3	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*
Series 27				F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1
				F3	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*

* Length available on request

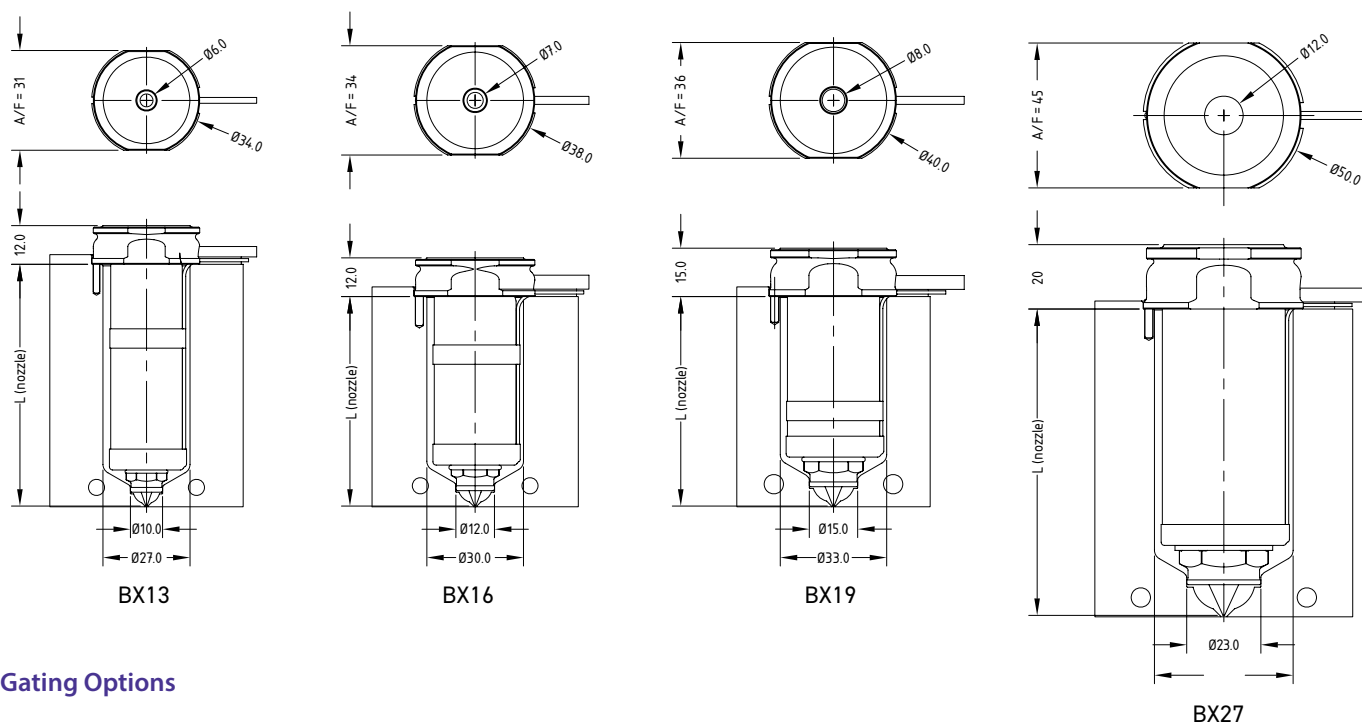
**Custom lengths available on request

Available in H13 and 420 steel

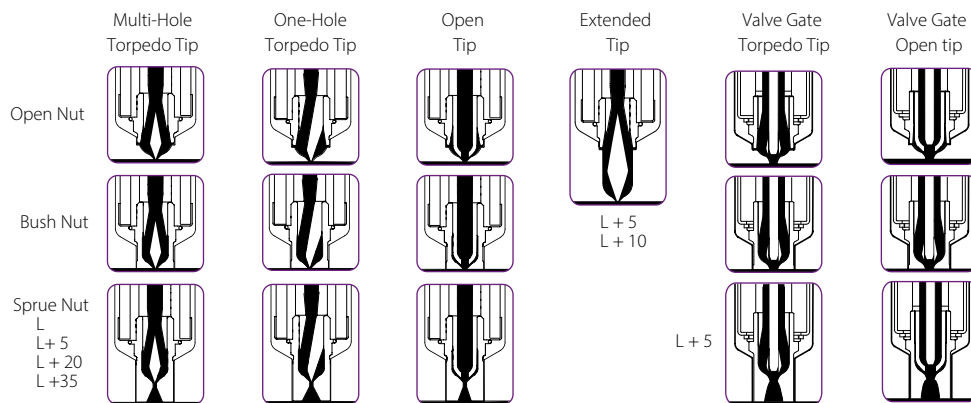
To suit machine nozzle, machine orifice and radius



BX nozzle is designed to provide a cost sensitive solution to single & multi-cavity applications.



Gating Options



BX Nozzle Body Lengths**

L =	45	55	65	75	85	95	105	115	130	145	160	175	200	225	250	275
Series 13	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	-	-	-	-
	F3*	F3*	F3	F3	F3*	F3	F3*	F3*	F3*	F3*	F3*	F3*	-	-	-	-
Series 16	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	-	-	-	-
	F3*	F3*	F3	F3	F3*	F3	F3*	F3	F3*	F3*	F3*	F3*	-	-	-	-
Series 19	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	-	-	-	-
	F3*	F3*	F3*	F3	F3*	F3	F3*	F3	F3*	F3*	F3*	F3*	-	-	-	-
Series 27	-	-	-	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1
	-	-	-	F3	F3*	F3	F3*	F3	F3*	F3*	F3*	F3*	F3*	F3*	F3*	F3*

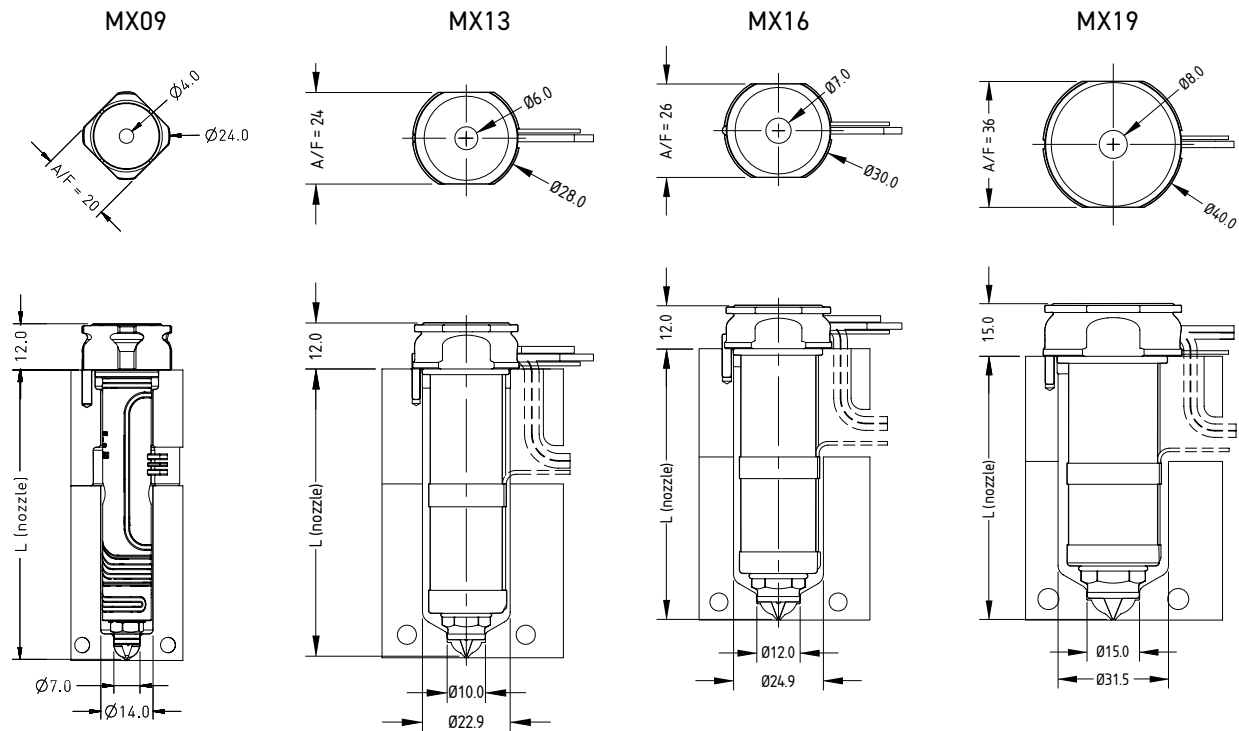
* Length available on request

**Custom lengths available on request

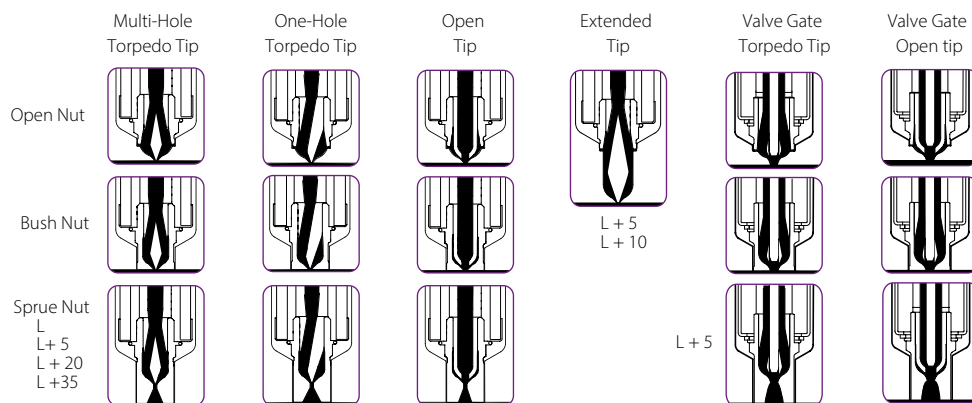
Available in H13 and 420 steel



Low moulding temperature and pressure, excellent temperature consistency and front loading capabilities, that's the Mastip MX nozzle, specifically designed for multi cavity manifold systems and hot halves. The MX nozzle is suited for small to medium applications in all types of markets. It is able to process a wide range of plastics, from the easy ethylenes to tough engineering resins.



Gating Options



MX Nozzle Body Lengths**

L =	45	55	65	75	85	95	105	115	130	145	160	175
Series 09	-	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1
Series 13	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1
	F3*	F3*	F3*	F3	F3	F3	F3*	F3*	F3*	F3*	F3*	F3*
Series 16	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1
	F3*	F3*	F3	F3	F3	F3	F3	F3	F3*	F3*	F3*	F3*
Series 19	-	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1	F1
	-	F3*	F3*	F3	F3	F3	F3	F3	F3*	F3*	F3*	F3*

* Length available on request

**Custom lengths available on request.

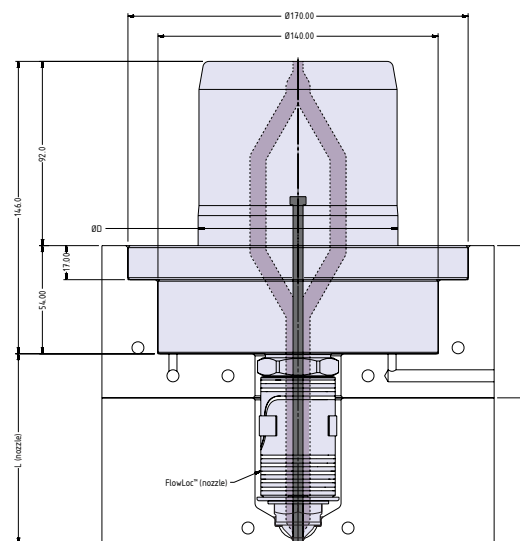
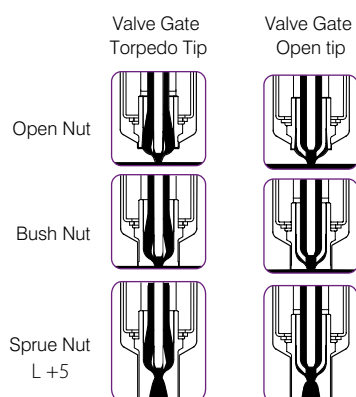
Available in H13 and 420 steel



Sporting an extremely compact design, the VeriShot™ system greatly reduces mould height requirements as it doubles as a locating ring housing the mechanics. This ensures perfect alignment between mould and machine platens. VeriShot™ is compatible with TX16, TX19 and TX27 FlowLoc™ nozzles, which screw directly into the lower manifold providing a secure, leak-proof solution.

- Stainless Steel construction for maximum service life
- Location ring can be sized to your requirement

Gating Options

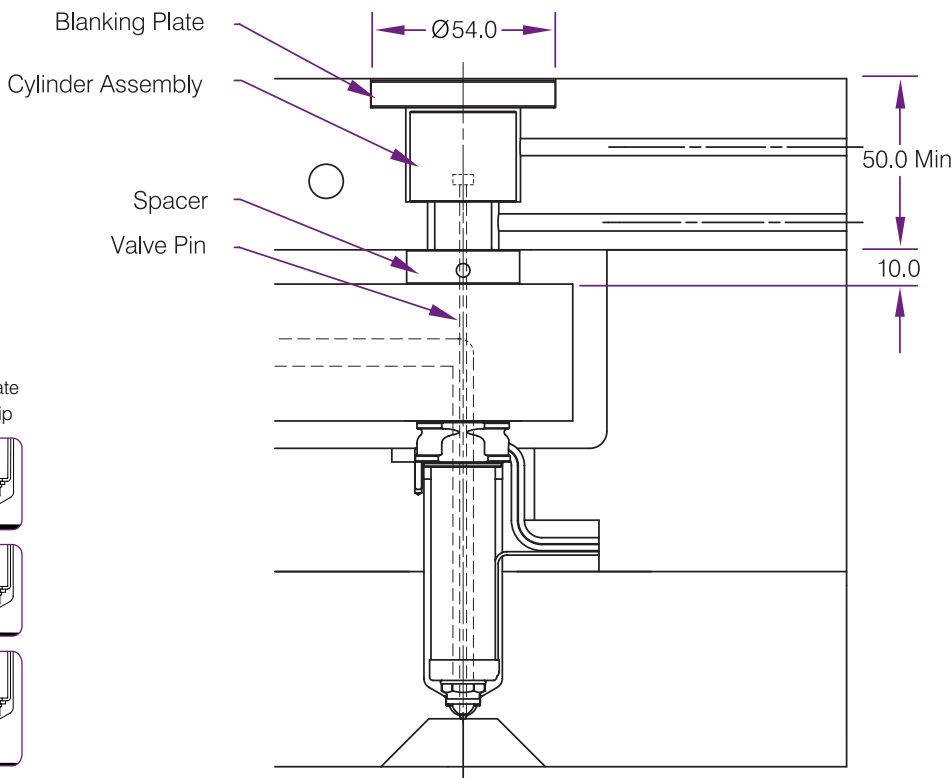


FlowLoc Nozzle Compatibility

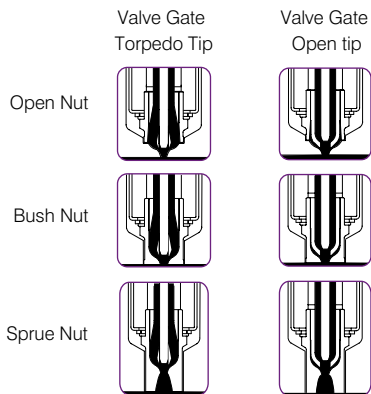
	16 Series	19 Series	27 Series
L	75	75	75
	85	85	85
	95	95	95
	105	105	105
	115	115	115
	130	130	130
	145	145	145
	160	160	160
	175	175	175
	200	200	200
	—	225	225
	—	250	250
	—	275	275
	—	300	300
	—	—	350
	—	—	400
	—	—	450

Valve Gate Assembly

	16 Series	19 Series	27 Series
Model	SVG	SVG	SVG
Actuation Type	Pneumatic	Pneumatic	Pneumatic
Pin Size	2.5	3.0	5.0
Stroke	10	10	10

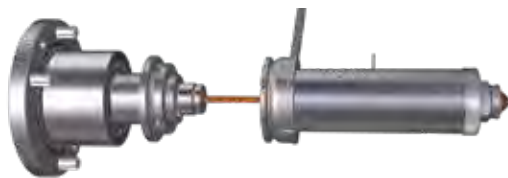


Gating Options

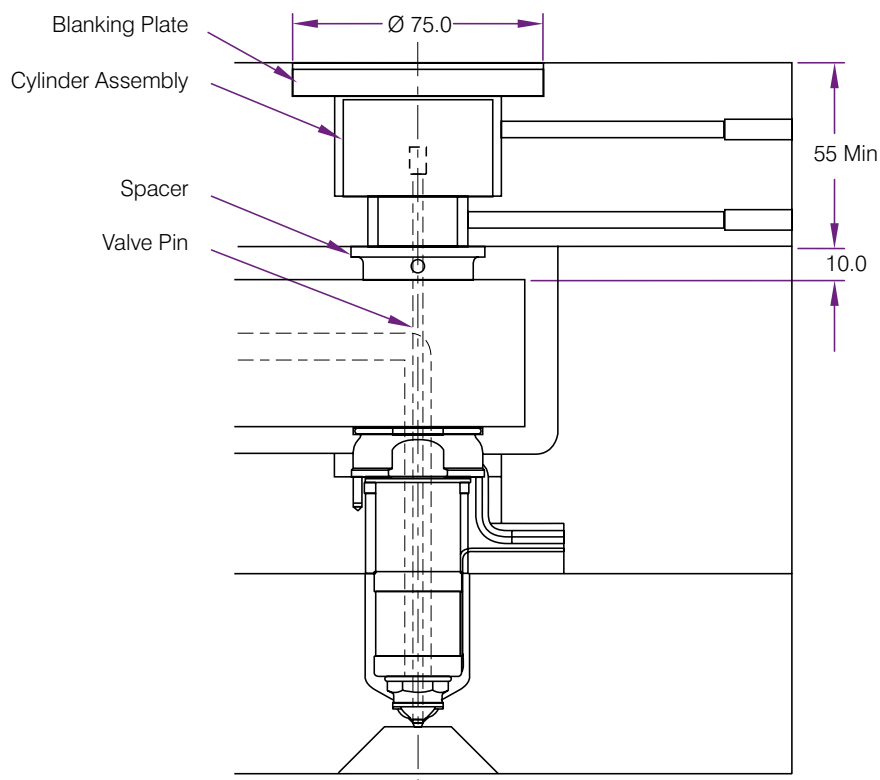
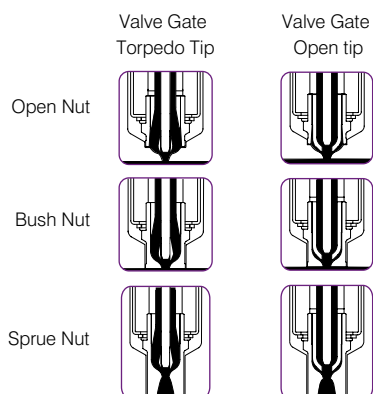


MVG25 Nozzle Compatibility			
Description	Nozzle	Nozzle Length	Supplied Pin Size
MVG25-P1 Headed Pin	MX13	45 - 175	Ø2.0
	BX13	45 - 225	
	MX16	45 - 175	Ø2.5
	BX16	45 - 250	

MGV25 Spares		
Description	Code	System
16 Series Piston Seal Kit	MVG25SEALS (80-000-101)	
13 Series Valve Pin & Seal Set		Specify System Number
16 Series Valve Pin & Seal Set		Specify System Number



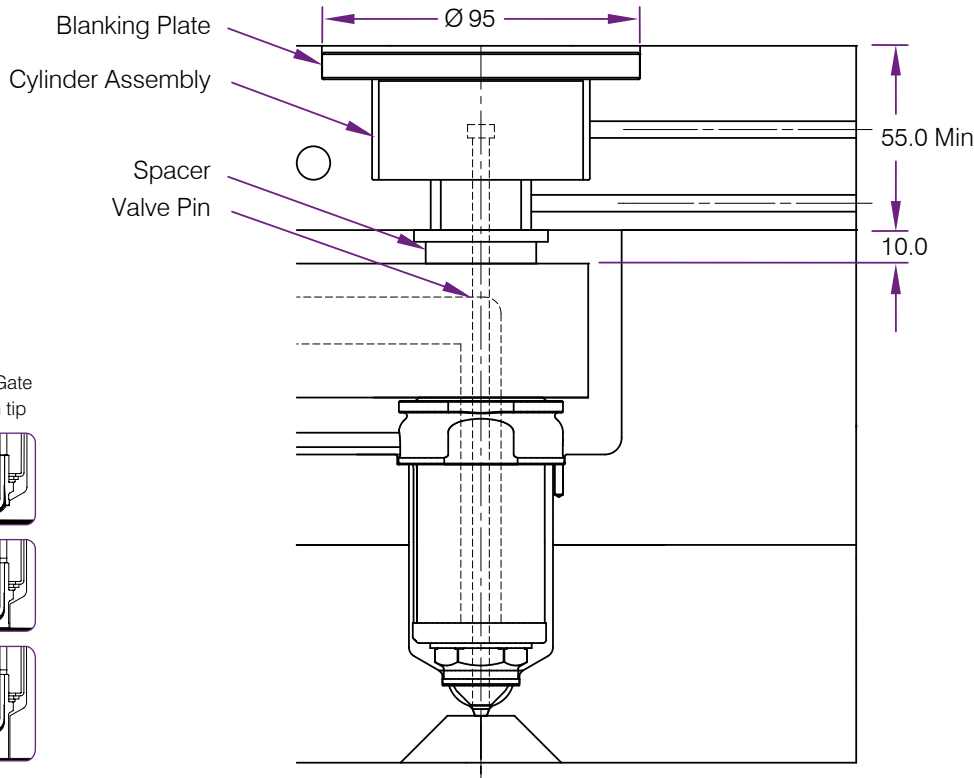
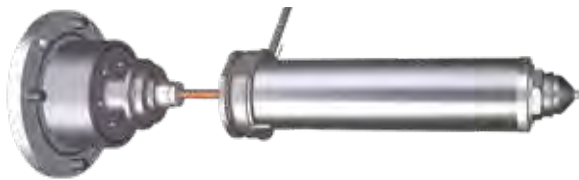
Gating Options



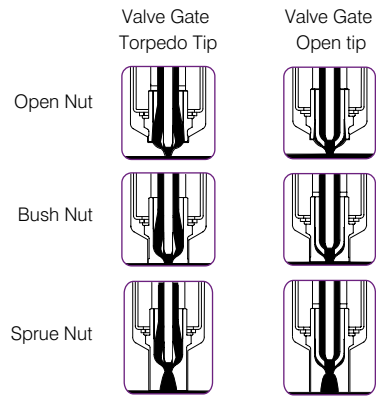
MVG40 Nozzle Compatibility			
Description	Nozzle	Nozzle Length	Supplied Pin Size
MGV40-P1 Headed Pin or Threaded	MX13	45 - 175	Ø2.0
	BX13	45 - 225	
	MX16	45 - 175	Ø2.5
	BX16	45 - 250	
	MX19	45 - 175	Ø3.0
	BX19	45 - 300	
	BX27	75 - 450	Ø5.0

MGV40 Spares		
Description	Code	System
16 Series Piston Seal Kit	MVG40SEALS (80-000-100)	
13 Series Valve Pin & Seal Set		Specify System Number
16 Series Valve Pin & Seal Set		Specify System Number
19 Series Valve Pin & Seal Set		Specify System Number
27 Series Valve Pin & Seal Set		Specify System Number

* 13 Series available in open nut and open tip only



Gating Options



MVG55 Nozzle Compatibility			
Description	Nozzle	Nozzle Length	Supplied Pin Size
MVG55-P1 Headed Pin	BX27	75 - 450	Ø5.0

MGV55 Spares		
Description	Code	System
Piston Seal Kit	MVG55SEALS (80-000-102)	
27 Series Valve Pin & Seal Set		Specify System Number

mastip™
hot runner solutions



Manifold systems to suit all your moulding requirements

Mastip's experienced teams can design and manufacture manifold systems to suit all your moulding requirements. All Mastip manifolds are designed to deliver a uniform melt to each nozzle, ensuring cavity-to-cavity consistency. This is achieved through natural balancing of the flow channels and ensuring constant temperature profiles are maintained across the manifold block. Small cavity or high cavity systems, simple single level or complex multi-level stack systems, thermal gate or valve gate systems, Mastip can provide you with a Manifold system to meet your requirements in standard high quality mould base steel or stainless steel plates.

Scan this QR code to go to website for further information:



Standard Layouts, Exceptional Results

Mastip has an extensive range of standard or customized manifold designs that ensure cavity-to-cavity consistency through the normal or theological balancing of flow channels.

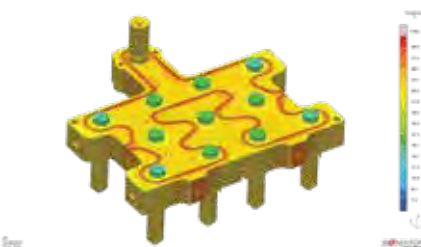
Each manifold incorporates durable, high quality components that deliver fast cycle times, precise gate control and superior quality parts.



Durable, Long-lasting Components

All manifolds are equipped with superior components including pressed-in heaters, ceramic connectors and high quality mould base or stainless steel plates, enabling them to perform under the most demanding applications and conditions.

Mastip's manifold range is further complimented by the industry leading X-Range nozzles and the extensive range of tip and nut combinations to deliver high performing, durable solutions able to meet the demands of the most abrasive and difficult to mould resins.



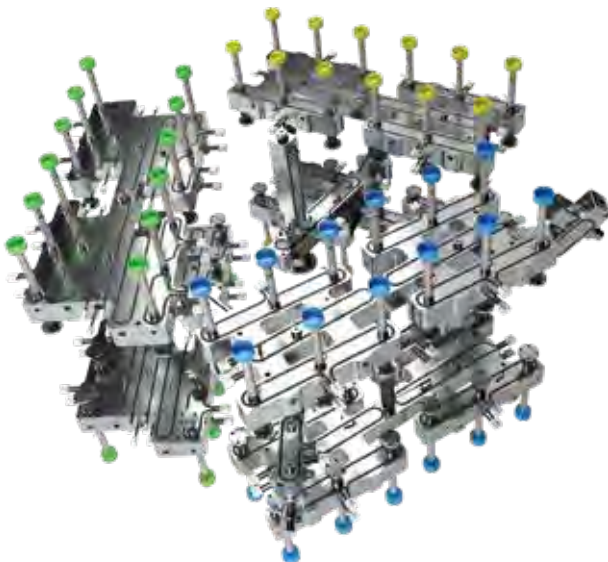
Designed, Manufactured and Tested

Every manifold goes through extensive design and analysis to ensure the following:

- optimised melt delivery
- improved production efficiencies
- perfect cavity-to-cavity filling
- excellent gate quality



mastip™
hot runner solutions



Ready ▶ Set ▶ Inject

Following on from the ground breaking success of Mastip's Nexus Thermal Gate we are proud to introduce the **Nexus Valve Gate with Cylix actuation.**

Mastip's next generation Nexus™ Systems are delivered Pre-Assembled and Pre-Wired as a complete turn-key solution for quick and simple installation.

Both the Nexus Thermal Gate and the Nexus Valve Gate Systems incorporate the advanced leak protection of FlowLoc™ Technology.

Scan this QR code for further information



Simple to Technically Advanced Multi-Material Systems

Mastip has extensive experience in supplying solutions for multi-material and multi-colour applications. Whether it is over moulding soft grips or different colours on single part, Mastip has the technology and technical expertise to develop the right multi-material hot runner solution for your needs. From simple high cavity plastic packaging to technically advanced components such as structural and engineering parts for the automotive industry, incorporating Mastip's multi-material systems into your mould can simplify your production, deliver quality parts and save you time and money on your product assembly.

Scan this QR code for further information.



High Cavity Single Or Multi-Level Systems

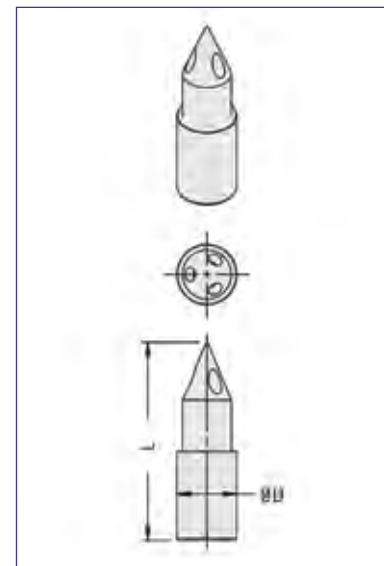
Mastip's expert teams can design and manufacture high cavity single or multi-level systems, with thermal or valve gates. Our systems are designed and manufactured to the highest level of quality, delivering a uniform melt to each nozzle, ensuring cavity-to-cavity consistency. This is achieved through natural balancing of the flow channels and ensuring constant temperature profiles are maintained across the manifold block. Mastip can provide you with a Manifold system to meet your requirements in standard high quality mould base steel or stainless steel plates.

Scan this QR code for further information:



Grade G1, G2

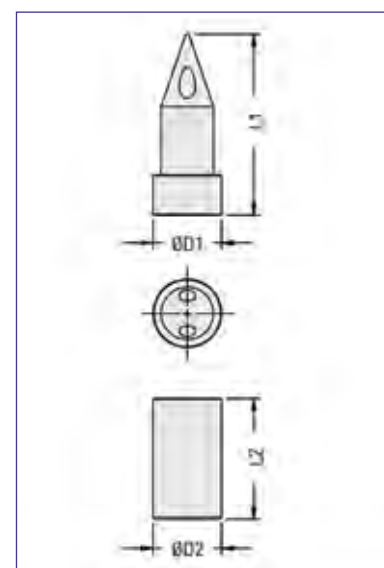
Product Code G1	Product Code G2	Dimensions mm	
		L	D
X13TTG1	X13TTG2	37.5	8.5
X13TT+5G1	X13TT+5G2	42.5	
X13TT+10G1	X13TT+10G2	47.5	
X16TTG1	X16TTG2	40	10.5
X16TT+5G1	X16TT+5G2	45	
X16TT+10G1	X16TT+10G2	50	
X19TTG1	X19TTG2	44.5	13.5
X19TT+5G1	X19TT+5G2	49.5	
X19TT+10G1	X19TT+10G2	54.5	
X27TTG1	X27TTG2	59	20
X27TT+10G1	X27TT+10G2	69	



Tips Torpedo & Extended - X Range Multi Hole

Grade G5

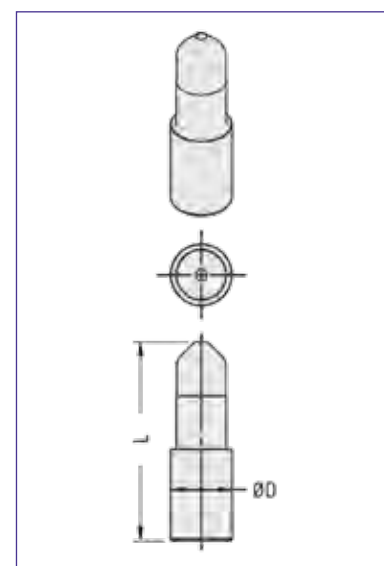
Product Code	Packer Code	Dimensions mm			
		L1	D1	L2	D2
X13TTG5	55-011-813	22.5	8.5	15	8.5
X16TTG5	55-011-816	25	10.5	15	10.5
X19TTG5	55-011-819	29.5	13.5	15	13.5
X27TTG5	55-011-827	41	20	18	20

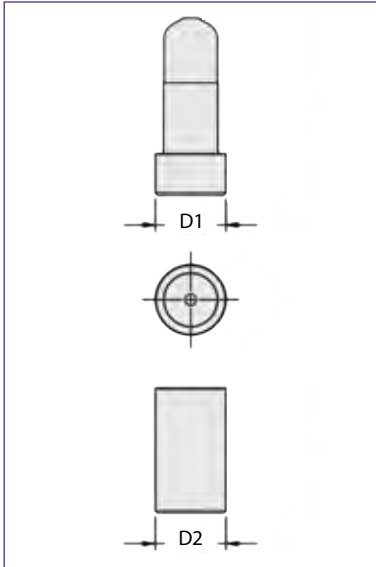


Tips Open - X Range

Grade G1

Product Code	Dimensions mm	
	L	D
X13OTG1	36.5	8.5
X16OTG1	38.7	10.5
X19OTG1	43.3	13.5
X27OTG1	57.4	20

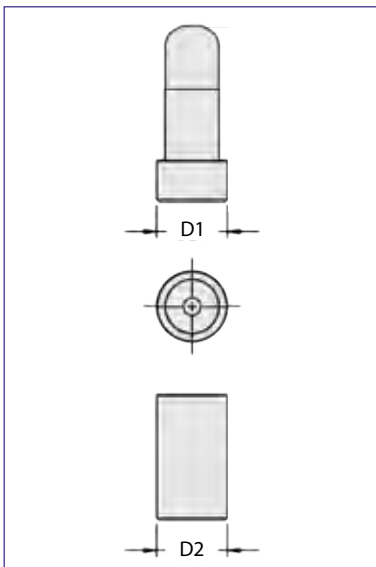




Grade G5

Product Code		
	D1	D2
X13OTG5	8.5	8.5
X16OTG5	10.5	10.5
X19OTG5	13.5	13.5
X27OTG5	20	20

Tips Open Valve - X Range Guided*

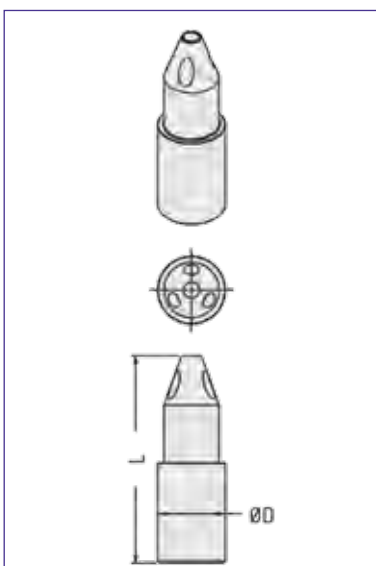


Grade G5

Product Code	Packer Code		
		D1	D2
X13GVG5	55-011-813	8.5	8.5
X16GVG5	55-011-816	10.5	10.5
X19GVGS	55-011-539	17.5	17.5
X27GVGS	55-011-136	20	20

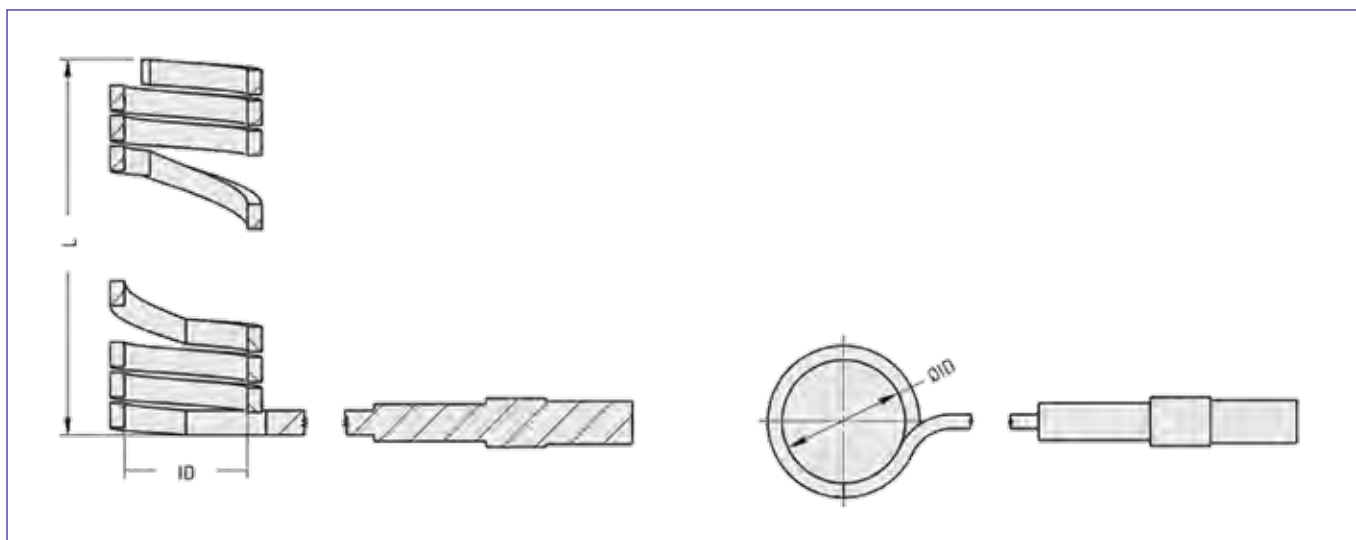
* Available with added Pin Guide if required

Tips Torpedo Valve - X Range



Grade G1

Product Code	Dimensions mm	
	L	D
X16TVG1	37.2	10.5
X19TVG1	41.3	13.5
X27TVG1	55	20



Nozzle Heaters - X Range Series 13

Product Code	Dimensions mm	
	L	ID
X13045H	39	16.1
X13055H	49	
X13065H	59	
X13075H	69	
X13095H	89	
X13115H	109	
X13145H	139	
X13175H	169	

Nozzle Heaters - X Range Series 16

Product Code	Dimensions mm	
	L	ID
X16045H	36	18.1
X16055H	46	
X16065H	56	
X16075H	66	
X16095H	86	
X16115H	106	
X16130H*	121	
X16145H	136	
X16175H	166	

Product Code	Dimensions mm	
	L	ID
X19055H	45	21.5
X19065H	55	
X19075H	65	
X19195H	85	
X19115H	105	
X19130H*	120	
X19145H	135	
X19175H	165	

Nozzle Heaters - X Range Series 27

Product Code	Dimensions mm	
	L	ID
X27075H	60	30.3
X27095H	80	
X27115H	100	
X27145H	130	
X27175H	160	
X27225H	210	
X27275H	260	

Rear Heaters - SX Range

Product Code	Nozzle Series
SX24H	SX13, SX16
SX30H	SX19, SX27

Product Code	Dimensions mm	
	L	ID
X13045HC	39	20.4
X13055HC	49	
X13065HC	59	
X13075HC	69	
X13095HC	89	
X13115HC	109	
X13145HC	139	
X13175HC	169	

Heater Covers - BX & SX Range Series 16

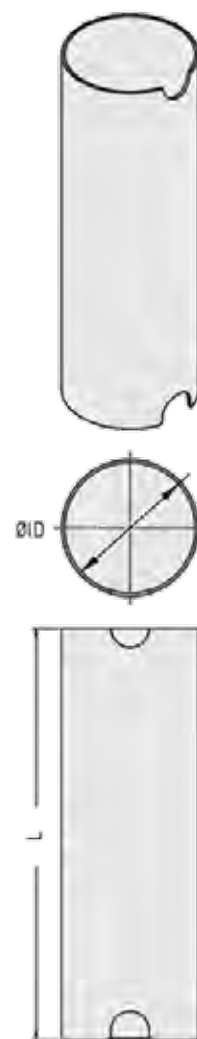
Product Code	Dimensions mm	
	L	ID
X16045HC	36	24
X16055HC	46	
X16065HC	56	
X16075HC	66	
X16095HC	86	
X16115HC	106	
X16130HC*	121	
X16145HC	136	
X16175HC	166	

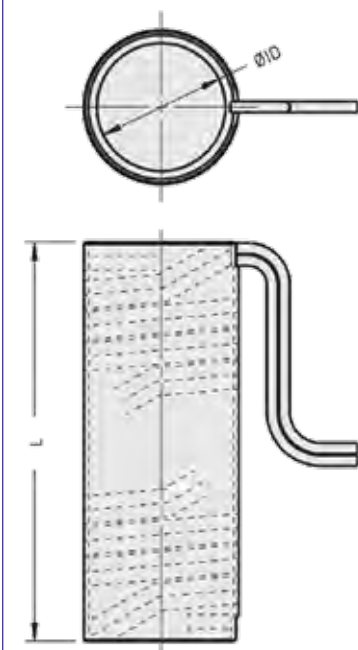
Heater Covers - BX & SX Range Series 19

Product Code	Dimensions mm	
	L	ID
X19055HC	46	27.2
X19065HC	56	
X19075HC	66	
X19095HC	86	
X19115HC	106	
X19130HC*	121	
X19145HC	136	
X19175HC	166	

Heater Covers - BX & SX Range Series 27

Product Code	Dimensions mm	
	L	ID
X27075HC	62	36.3
X27095HC	82	
X27115HC	102	
X27145HC	132	
X27175HC	162	
X27225HC	212	
X27275HC	262	





Product Code	Dimensions mm	
	L	ID
MX13045HFS	39	14.6
MX13055HFS	49	
MX13065HFS	59	
MX13075HFS	69	
MX13095HFS	89	
MX13115HFS	109	
MX13130HFS	124	
MX13145HFS	139	
MX13175HFS	169	

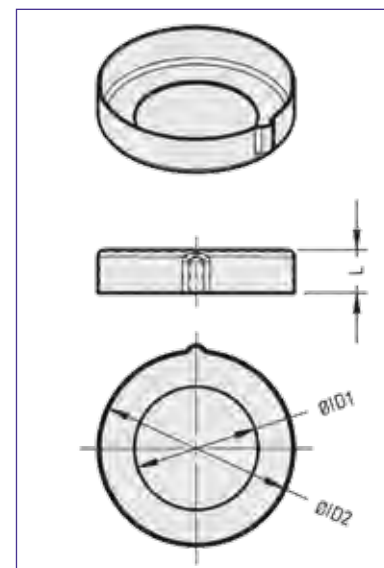
Nozzle Heaters Sleeved - MX Series 16

Product Code	Dimensions mm	
	L	ID
MX16045HFS	37	16.6
MX16055HFS	47	
MX16065HFS	57	
MX16075HFS	67	
MX16095HFS	87	
MX16115HFS	107	
MX16130HFS	122	
MX16145HFS	137	
MX16175HFS	167	

Nozzle Heaters Sleeved - MX Series 19

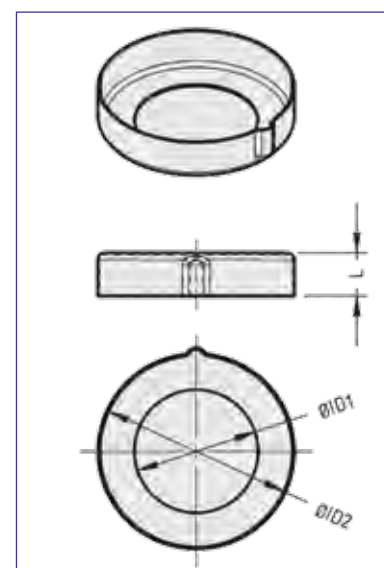
Product Code	Dimensions mm	
	L	ID
MX19055HFS	46	21.1
MX19065HFS	56	
MX19075HFS	66	
MX19095HFS	86	
MX19115HFS	106	
MX19130HFS	121	
MX19145HFS	136	
MX19175HFS	166	

Product Code	Dimensions mm		
	L	ID1	ID2
X13CAP	6.5	12.7	22.4
X16CAP	6.5	14.9	25.6
X19CAP	6.5	18.5	28.8
X27CAP	6.5	27.7	38.3



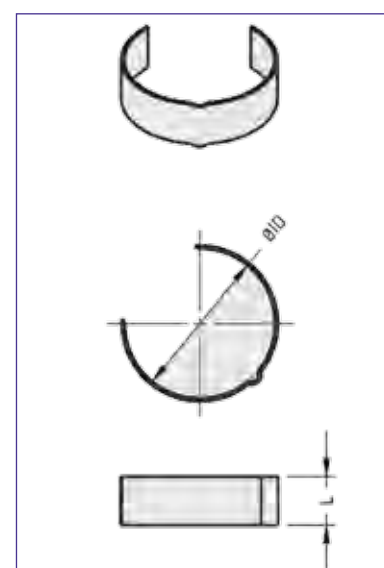
Heater Caps - MX Range

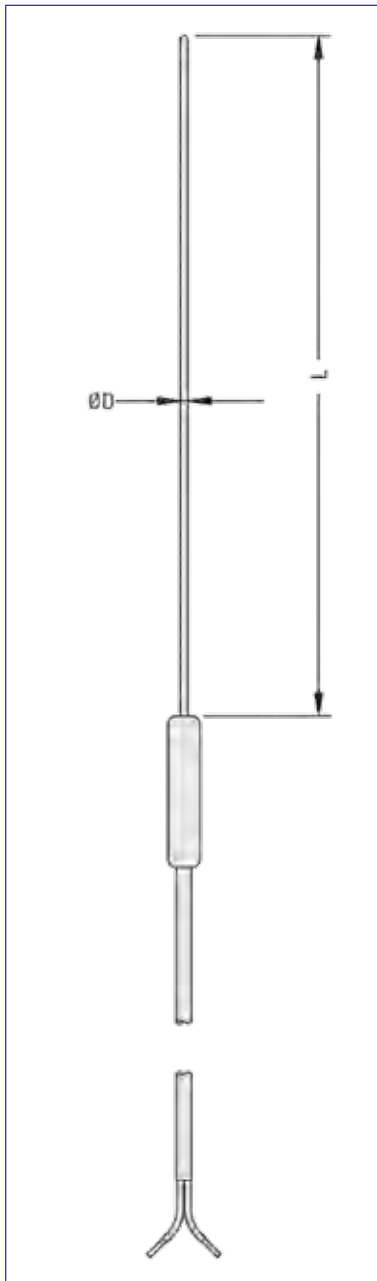
Product Code	Dimensions mm		
	L	ID1	ID2
MX13CAP	6	12.7	19
MX16CAP	6	14.9	21
MX19CAP	6	18.5	25.6



Thermocouple Clips - X Range

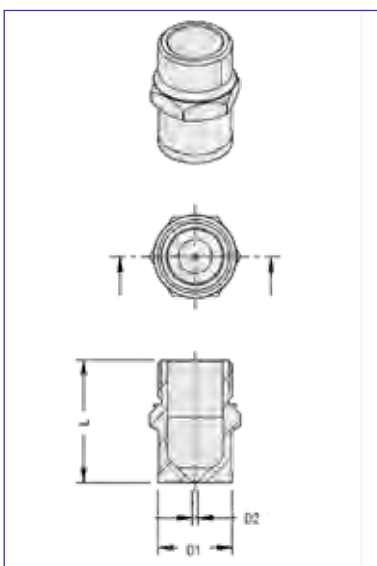
Product Code	Series	Dimensions mm	
		L	ID
MX13CLIP	MX13	6	18.5
MX16CLIP X13CLIP	MX16 BX/SX13	6	20.3
MX19CLIP X16CLIP X19CLIP	MX19 BX/SX16 BX/SX19	8	24.7
X27CLIP	BX/SX27	10	37





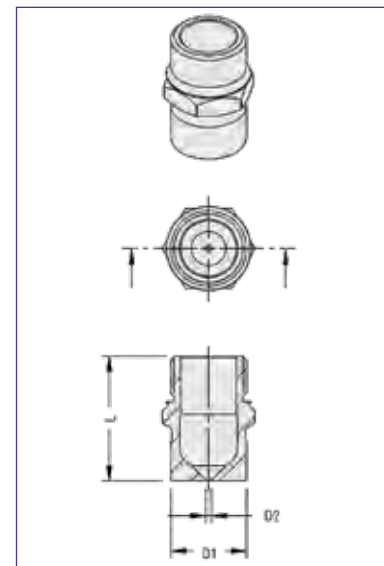
Product Code	Dimensions mm	
	L	D
XTCG1X060	60	1
XTCG1X090	90	
XTCG1X120	120	
XTCG1X150	150	
XTCG1X180	180	
XTCG1X200	200	
XTCG1X225	225	
XTCG1X250	250	
XTCG1X275	275	
XTCG1X300	300	
XTCG1X325	325	
XTCG1X375	375	
XTCG1X400	400	
XTCG1X450	450	
XTCG1X500	500	
XTCG1X550	550	
XTCG1X600	600	1.5
XTCG1X650	650	
XTCG1X700	700	
MASMT7515TC	75	
MASMT15015TC	150	
MASMT25015TC	250	
MASMT30015TC	300	
MASMT35015TC	350	

Bush Nut (BN) - X Range H1 Standard



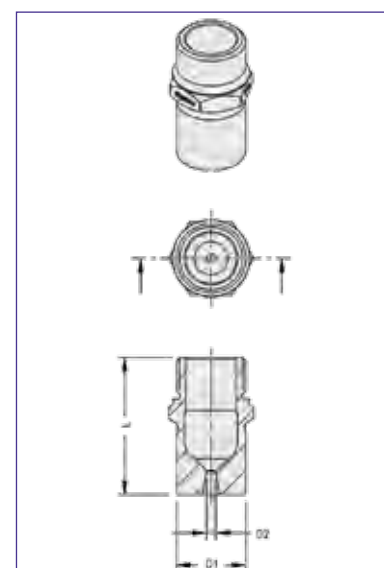
Product Code	Dimensions mm		
	L	D1	D2
X13BN	17.7	10	0.9
X16BN	20.2	12	1
X19BN	24.7	15	1.2
X27BN	34.2	23	2

Product Code	Dimensions mm		
	L	D1	D2
X13BE	17.7	10	0.9
X16BE	20.2	12	1
X19BE	24.7	15	1.2
X27BE	34.2	23	2



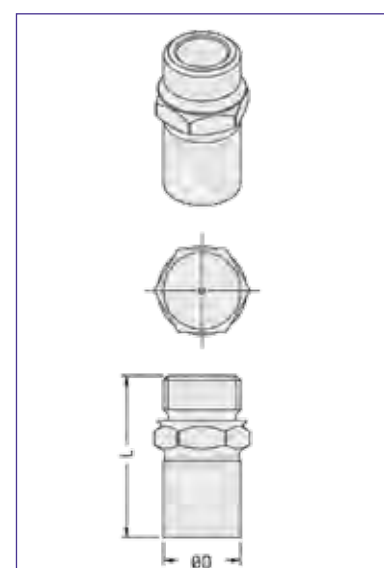
Sprue Nut Extended 5mm (SN) - X Range H1 Standard

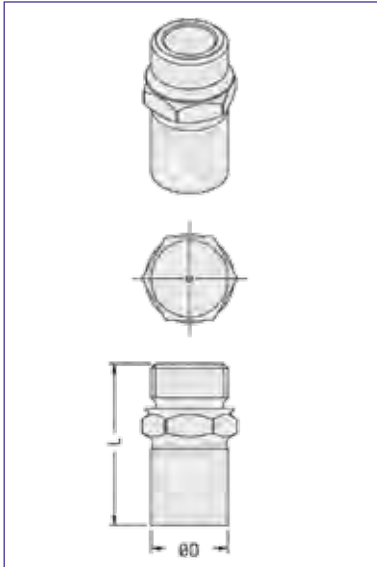
Product Code	Series	Dimensions mm		
		L	D1	D2
X13SN	13	22.7	10	0.9
X16SN	16	25.2	12	1
X19SN	19	29.7	15	1.2
X27SN	27	39.2	23	2



Sprue Nut Extended 20mm (SX) - X Range

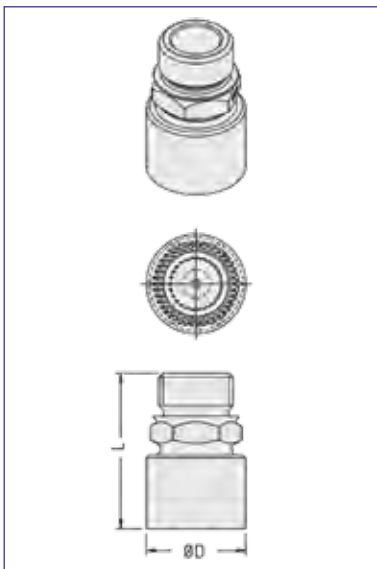
Product Code	Series	Dimensions mm	
		L	D1
X13SX	13	37.7	10
X16SX	16	40.2	12
X19SX	19	44.7	15





Product Code	Series	Dimensions mm	
		L	D1
X13SL	13	52.7	10
X16SL	16	55.2	12
X19SL	19	59.7	15
X19SL	27	69.2	23

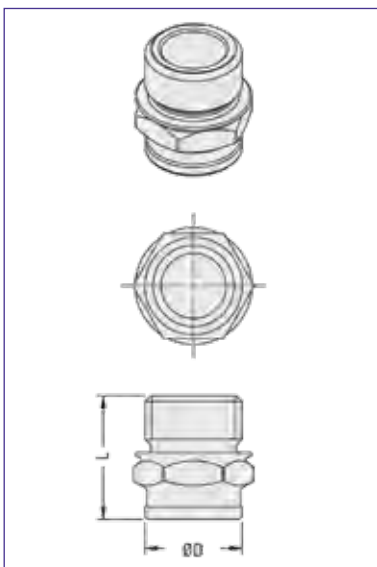
Sprue Nut Extended 5mm (SN-R) - X Range Retro



Product Code	Series	Dimensions mm	
		L	D*
X13SN-R	13	22.7	13.1
X16SN-R	16	25.2	16.1
X19SN-R	19	29.7	19.1
X27SN-R	27	39.2	27.1

* ØD to be finished by customer or contact us to supply ready to use

Open Nut Ground (ONT) - X Range



Product Code	Series	Dimensions mm	
		L	D
X13ONT	13	13.2	10
X16ONT	16	15.2	12
X19ONT	19	18.5	15
X27ONT	27	24.5	23

Product Code	Series	Dimensions mm	
		L	D
X13ONT-R	13	13.2	13.1
X16ONT-R	16	15.2	16.1
X19ONT-R	19	18.5	19.1
X27ONT-R	27	24.5	27.1



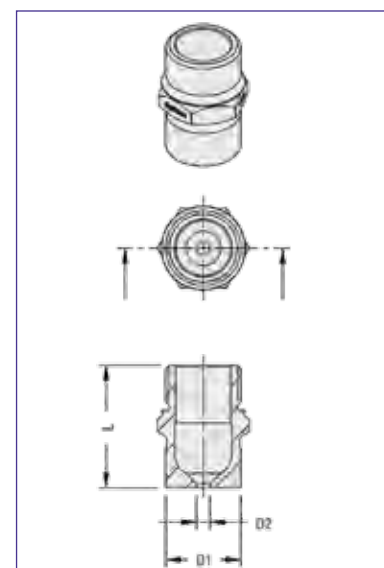
Bush Nut (BN) - BX25 Series

Product Code	Dimensions mm (inch)	
	L	D
X25BN	24.7 (0.97")	25.4 (1")



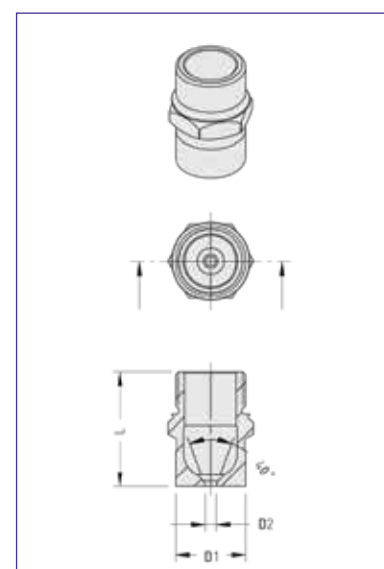
Bush Nut (VBE) - Valve Cylindrical Gate X Range H5

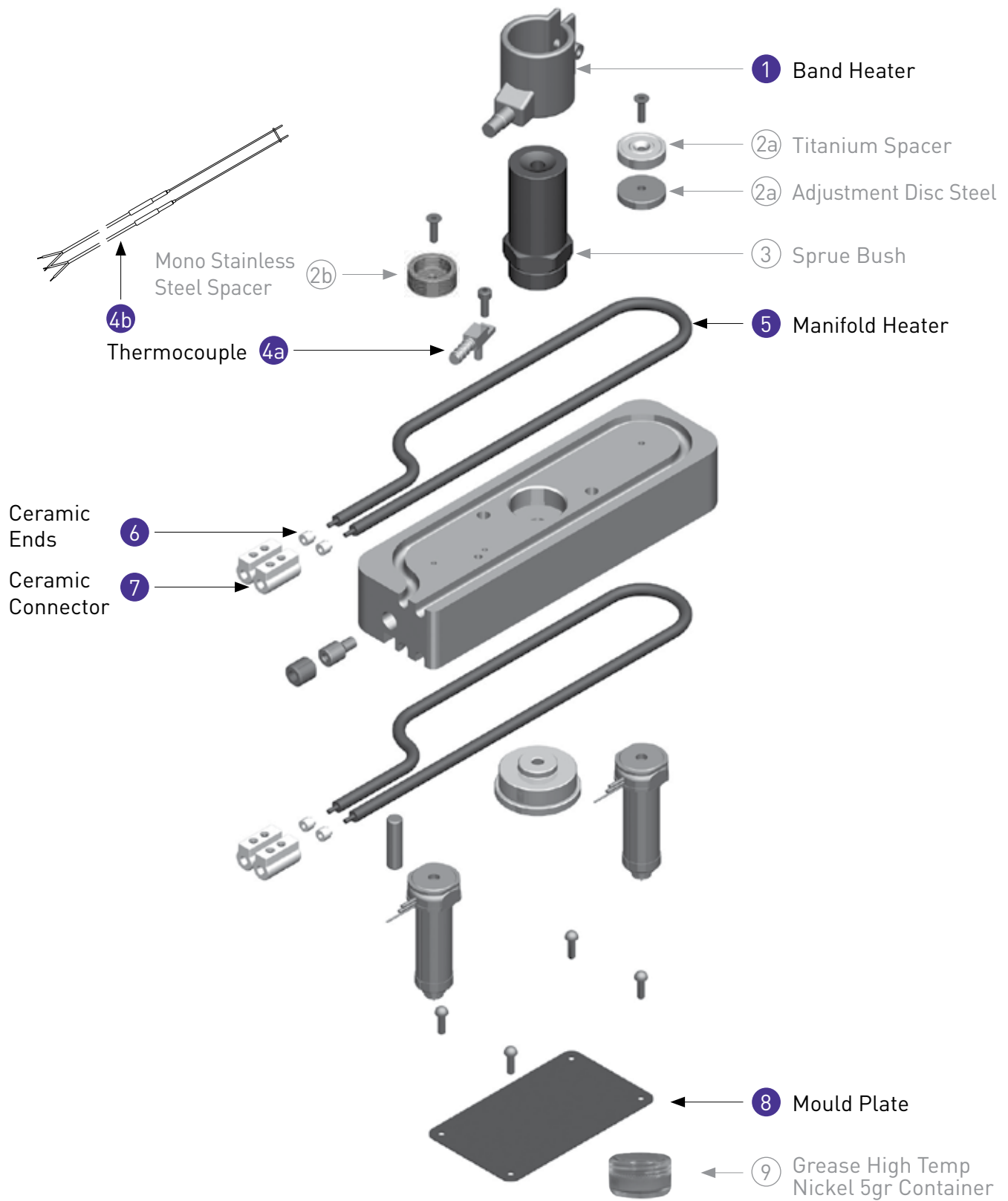
Product Code	Dimensions mm		
	L	D1	D2
55-010-472	20.0	12	2.2
55-010-473	24.5	15	2.7
55-010-474	34.0	23	4.6



Bush Nut (VBE) - Valve Conical Gate X Range H1 Standard

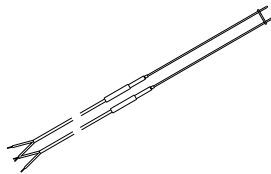
Product Code	Dimensions mm		
	L	D1	D2
X16VBE	20.0	12	1.8
X19VBE	24.5	15	2.2
X27VBE	34.0	23	3.5





1		1		1		1	
	*		*		*		*
Band Heater Ø30 x 20mm		Band Heater Ø30 x 30mm		Band Heater Ø30 x 40mm		Band Heater Ø30 x 60mm	
MASMANBHTC30/20		MASMANBHTC30/30		MASMANBHTC30/40		MASMANBHTC30/60	

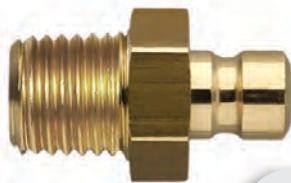
*Built in J-Type thermocouple.

4a		4b	
	**		
Thermocouple		Hot Half Thermocouple	
Submit System Number		Submit System Number	
MASTE7003		39-850-000	

**J-Type thermocouple. K Type available on request.

5		6	
Manifold Heater		Ceramic Ends	
Submit System Number		TUBCERAMIC	

7		8	
Ceramic Connector		Mould Plate	
MASCC		Submit System Number	
		51-001-020	



MOULD COOLING

■	Brass Couplings, Sockets	127
■	Air Fittings	138
■	Baffles	140
■	Heat Transfer Rods	141
■	Cascade Assemblies	141
■	Hose Crimper & Ferrules	142
■	Polyurethane Hose	144
■	Push Fittings	145
■	Air Guns	147
■	Ball Valves	147
■	Manifolds	148
■	Water Flow Regulators	151

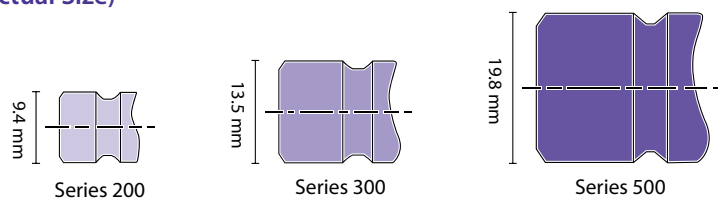
TEMPERATURE CONTROL & PLUGS

■	Temperature Controllers	155
■	Mainframe	156
■	RMA Modular Controllers	157
■	Mould Junction Box	158
■	Module Fuses	158
■	Connector Crimps	159
■	Blank Panel	159
■	Universal Floor Stand	159
■	Power Cables & Electrical Connectors	160
■	Band, Micro Coil & Custom Heaters	169
■	Insulation Barrel Blankets	172
■	Thermocouples	173

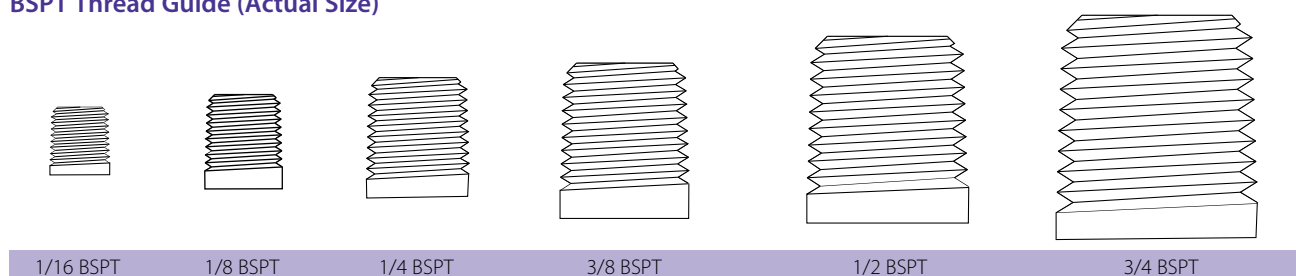
MOULDERS PRODUCTION ACCESSORIES

■	De-Duster	174
■	Magic Catch	175
■	Temperature Control Units	176
■	De-scaling Pump Kit	177
■	Counter View Monitors	178
■	Clamps, Nuts & Bolts	180
■	Hopper Magnets	181
■	Mould Curtains	181
■	Bernzomatic -Torch Kit & Accessories	182
■	Moulder's Specialty Sprays, Protectors & Releases	182
■	Pressure Test Kit	182
■	Moulder's Specialty Lubricants & Polishes	183
■	Copper Anti-Seize	185
■	Purging Compounds	186
■	Oil Absorbant Clay & Sheets	186
■	Mould Wipes	186
■	Heat Transfer & Anti-Seize Compound	187
■	Nano Plas Mould Coating	187
■	Zap-Ox Cleaner	187
■	Sprue Reamers	187
■	Thor Hammers	188
■	Bronze Tools	188
■	Sprue Snips	189
■	Work Finishers	190
■	Knock Out Bar Set	190
■	Pry Bar	190
■	Leather Gloves	190
■	Limit Switches	191
■	Deburring Tools	192

200, 300 & 500 Series (Actual Size)



BSPT Thread Guide (Actual Size)



Water



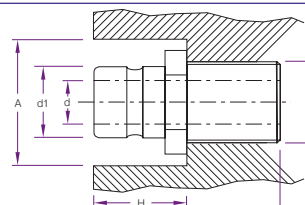
Oil



Temperature max.



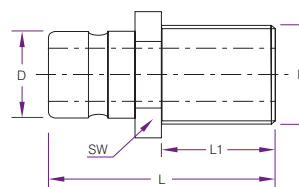
Only in combination with Push-Lock hose and Push-Lock hosetail



Product Code	Series	R (BSPT)	D1	H	A	L
CM251	200 Series 1/4 Flow	1/8	9.4	17	22	25
CM252		1/4	9.4	19	26	29
CM253		3/8	9.4	19	30	30
CM351	300 Series 3/8 Flow	1/8	13.5	25	26	35
CM352*		1/4	13.5	25	26	35
CM353*		3/8	13.5	26	30	38
CM354	500 Series 1/2 Flow	1/2	13.5	28	37	42
CM552		1/4	19.8	37	30	41
CM553		3/8	19.8	37	32	41
CM554		1/2	19.8	38	32	39
CM556		3/4	19.8	38	38	45

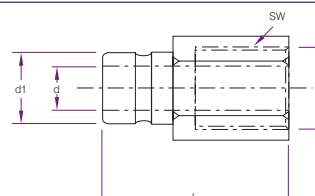
*Also available with internal valve, specify "V".

Plug - Male with Teflon

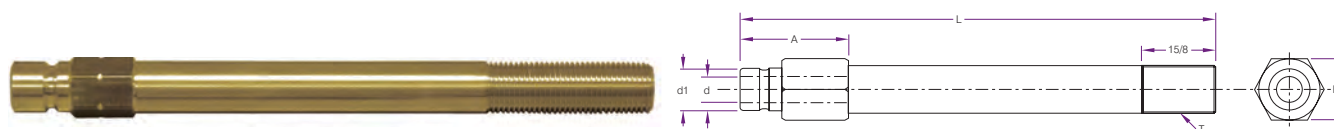


Product Code	Series	R (BSPT)	D	L	L1	SW
CMT251	200 Series	1/8	9.4	24	9	13
CMT252		1/4	9.4	29	12	16
CMT253		3/8	9.4	30	12	19
CMT352	300 Series	1/4	13.5	34	12	16
CMT353		3/8	13.5	34	12	19
CMT354		1/2	13.5	39	17	24
CMT554	500 Series	1/2	19.8	44	17	22
CMT556		3/4	19.8	45	19	29

Plug - Female



Product Code	Series	R (BSPT)	d	d1	L	SW
CM251F	200 Series	1/8	6	9.4	28	13
CM252F		1/4	6	9.4	32	17
CM253F		3/8	6	9.4	34	19
CM352F	300 Series	1/4	9	13.5	37	17
CM353F		3/8	9	13.5	39	19
CM354F		1/2	9	13.5	46	24



200 Series 1/4 Flow

Product Code	L	T (BSPT)	d	d1	A
CM251212	2 1/2	1/8	6	9.4	11/16
CM2514	4	1/8	6	9.4	1
CM251512	5 1/2	1/8	6	9.4	1
CM2517	7	1/8	6	9.4	1
CM251812	8 1/2	1/8	6	9.4	1
CM252212	2 1/2	1/4	6	9.4	7/8
CM2524	4	1/4	6	9.4	1 1/4
CM252512	5 1/2	1/4	6	9.4	1 1/4
CM2527	7	1/4	6	9.4	1 1/4
CM252812	8 1/2	1/4	6	9.4	1 1/4
CM253212	2 1/2	3/8	6	9.4	1
CM2534	4	3/8	6	9.4	1 1/4
CM253512	5 1/2	3/8	6	9.4	1 1/4
CM2537	7	3/8	6	9.4	1 1/4

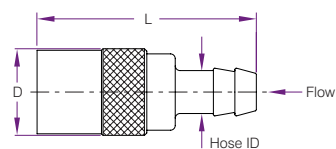
300 Series 3/8 Flow

Product Code	L	T (BSPT)	d	d1	A
CM351212	2 1/2	1/8	9.4	13.5	7/8
CM3514	4	1/8	9.4	13.5	1
CM351512	5 1/2	1/8	9.4	13.5	1
CM3517	7	1/8	9.4	13.5	1
CM351812	8 1/2	1/8	9.4	13.5	1
CM352212	2 1/2	1/4	9.4	13.5	7/8
CM3524	4	1/4	9.4	13.5	1 1/4
CM352512	5 1/2	1/4	9.4	13.5	1 1/4
CM3527	7	1/4	9.4	13.5	1 1/4
CM352812	8 1/2	1/4	9.4	13.5	1 1/4
CM35210	10	1/4	9.4	13.5	1 1/4
CM3534	4	3/8	9.4	13.5	1
CM353512	5 1/2	3/8	9.4	13.5	1 1/4
CM3537	7	3/8	9.4	13.5	1 1/4
CM35310	10	3/8	9.4	13.5	1 1/4

Seal

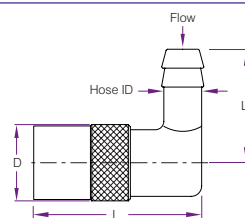


Product Code	Description
CM200	200 Series Viton
CM300-G	300 Series Viton
CM300-R	300 Series Silicone
CM500	500 Series Silicone



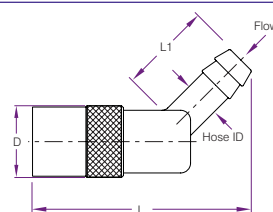
Product Code	Product Code without Valve	Hose with Valve	Flow	L	D	Series
CM206	CM206V	3/8	1/4	51mm	17	200
CM306	CM306V	3/8	1/4	64mm	23	300
CM308	CM308V	1/2	3/8	66.5mm	23	300
CM308SL	CM308VSL	1/2	3/8	73mm	23	300
CM506	CM506V	3/4	5/8	89mm	30	500

Coupling - 90° Male

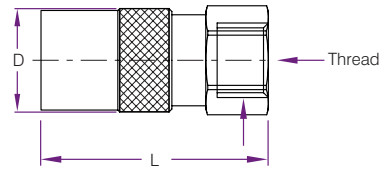


Product Code without Valve	Product Code with Valve	Hose ID	Flow	L	L1	D	Series
CM216	CM216V	3/8	1/4	40mm	22mm	17	200
CM316	CM316V	3/8	1/4	56mm	28.5mm	23	300
CM318	CM318V	1/2	3/8	56mm	28.5mm	23	300
CM516	CM516V	3/4	5/8	77mm	32mm	30	500

Coupling - 45° Male

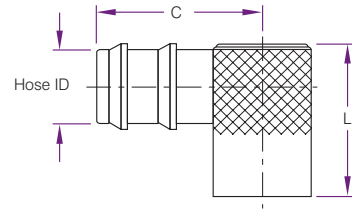
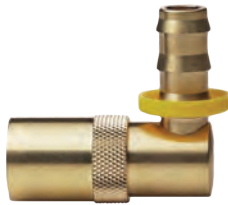


Product Code without Valve	Product Code with Valve	Hose ID	Flow	L	L1	D	Series
CM226	CM226V	3/8	1/4	55.5mm	22mm	18	200
-	CM326V	3/8	1/4	75mm	25mm	24	300
CM328	CM328V	1/2	3/8	75mm	25mm	24	300
CM526	CM526V	3/4	5/8	77mm	30mm	32	500



Product Code without Valve	Product Code with Valve	Thread	L	D	Series
CMB200		1/8	40	18	200
CMB300	CMB300V	1/4	47	23	300
CMB500		1/2	52	30	500

Coupling - 90° Push Lock



Product Code without Valve	Hose ID	Flow	L	D	Series
WJ200-6	3/8	1	1 1/4	3/8	5/8
WJ300-6	3/8	1 7/16	1 9/16	1/2	7/8
WJ300-8	1/2	1 7/16	1 9/16	1/2	7/8

Joiner - Hose to Hose



Product Code	Description
TFP7-316	3/16 Hose to Hose Joiner
TFP7-14	1/4 Hose to Hose Joiner
TFP7-516	5/16 Hose to Hose Joiner
TFP7-38	3/8 Hose to Hose Joiner
TFP7-12	1/2 Hose to Hose Joiner
TFP7-34	3/4 Hose to Hose Joiner

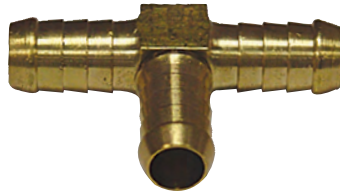


Product Code	Description
TFP3-31618	3/16 Hose Tail x 1/8 Male BSP
TFP3-31614	3/16 Hose Tail x 1/4 Male BSP
TFP3-1418	1/4 Hose Tail x 1/8 Male BSP
TFP3-1414	1/4 Hose Tail x 1/4 Male BSP
TFP3-1438	1/4 Hose Tail x 3/8 Male BSP
TFP3-1412	1/4 Hose Tail x 1/2 Male BSP
TFP3-51618	5/16 Hose Tail x 1/8 Male BSP
TFP3-51614	5/16 Hose Tail x 1/4 Male BSP
TFP3-51638	5/16 Hose Tail x 3/8 Male BSP
TFP3-51612	5/16 Hose Tail x 1/2 Male BSP
TFP3-3818	3/8 Hose Tail x 1/8 Male BSP
TFP3-3814	3/8 Hose Tail x 1/4 Male BSP
TFP3-3838	3/8 Hose Tail x 3/8 Male BSP
TFP3-3812	3/8 Hose Tail x 1/2 Male BSP
TFP3-3834	3/8 Hose Tail x 3/4 Male BSP
TFP3-1218	1/2 Hose Tail x 1/8 Male BSP
TFP3-1214	1/2 Hose Tail x 1/4 Male BSP
TFP3-1238	1/2 Hose Tail x 3/8 Male BSP
TFP3-1212	1/2 Hose Tail x 1/2 Male BSP
TFP3-1234	1/2 Hose Tail x 3/4 Male BSP
TFP3-3438	3/4 Hose Tail x 3/8 Male BSP
TFP3-3412	3/4 Hose Tail x 1/2 Male BSP
TFP3-3410	3/4 Hose Tail x 1" Male BSP
TFP3-1034	1" Hose Tail x 3/4 Male BSP
TFP3-1010	1" Hose Tail x 1" Male BSP

Hose Tail to Female BSP



Product Code	Description
TFP10-3814	3/8 Tail 1/4 Female BSP
TFP10-1214	1/2 Tail 1/4 Female BSP
TFP10-1238	1/2 Tail 3/8 Female BSP
TFP10-1212	1/2 Tail 1/2 Female BSP

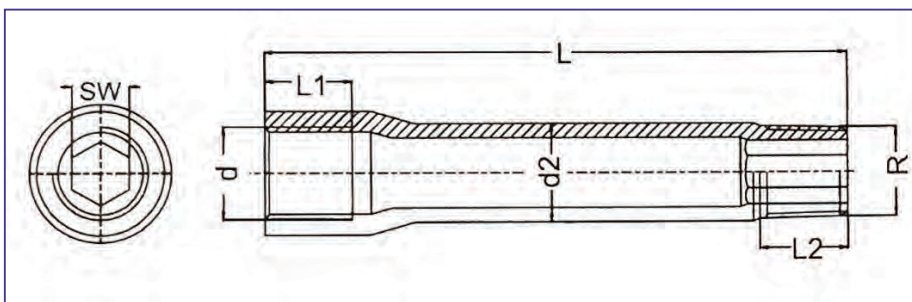


Product Code	Description
TFP14-316	3/16 3-Way Tee Hose Joiners
TFP14-14	1/4 3-Way Tee Hose Joiners
TFP14-516	5/16 3-Way Tee Hose Joiners
TFP14-38	3/8 3-Way Tee Hose Joiners
TFP14-12	1/2 3-Way Tee Hose Joiners
TFP14-34	3/4 3-Way Tee Hose Joiners

Extension Nipple - Female to Male BSP



Zinc plated steel connector for use when increased length is required, featuring a female thread on one end and a male thread on the other.



Product Code	d	R	d2	L	L1	L2	SW	Availability
EX18050	R1/8	R1/8	10	50	12	10	10	*
EX18075	R1/8	R1/8	10	75	12	10	10	*
EX18100	R1/8	R1/8	10	100	12	10	10	Stock Line
EX18125	R1/8	R1/8	10	125	12	10	10	*
EX14050	R1/4	R1/4	14	50	12	10	10	*
EX14075	R1/4	R1/4	14	75	12	10	10	*
EX14100	R1/4	R1/4	14	100	12	10	10	Stock Line
EX14125	R1/4	R1/4	14	125	12	10	10	*
EX14150	R1/4	R1/4	14	150	12	10	10	*

Tapered BSPT thread

* On Request



Product Code	Description
TF25E-18-90	1/8 Male to Female 90° Elbow
TF25E-14-90	1/4 Male to Female 90° Elbow
TF25E-38-90	3/8 Male to Female 90° Elbow
TF25E-12-90	1/2 Male to Female 90° Elbow

Nipple - Male Hexagonal BSP



Product Code	Description
TF27-18	1/8 Male BSP Hexagonal Nipple
TF27-14	1/4 Male BSP Hexagonal Nipple
TF27-38	3/8 Male BSP Hexagonal Nipple
TF27-12	1/2 Male BSP Hexagonal Nipple
TF27-34	3/4 Male BSP Hexagonal Nipple
TF27-10	1" Male BSP Hexagonal Nipple

Adaptor - Female to Male BSP



Product Code	Description
TF72-1818	1/8F - 1/8M Male to Female BSP Adaptors
TF72-1418	1/4F - 1/8M Male to Female BSP Adaptors
TF72-1414	1/4F - 1/4M Male to Female BSP Adaptors
TF72-3814	3/8F - 1/4M Male to Female BSP Adaptors
TF72-3838	3/8F - 3/8M Male to Female BSP Adaptors
TF72-1214	1/2F - 1/4M Male to Female BSP Adaptors
TF72-1238	1/2F - 3/8M Male to Female BSP Adaptors
TF72-1212	1/2F - 1/2M Male to Female BSP Adaptors
TF72-3412	3/4F - 1/2M Male to Female BSP Adaptors



Product Code	Description
TF24-1418	1/4 X 1/8 Male to Female Reducing Bush
TF24-3818	3/8 x 1/8 Male to Female Reducing Bush
TF24-3814	3/8 x 1/4 Male to Female Reducing Bush
TF24-1214	1/2 x 1/4 Male to Female Reducing Bush
TF24-1238	1/2 x 3/8 Male to Female Reducing Bush
TF24-3414	3/4 x 1/4 Male to Female Reducing Bush
TF24-3438	3/4 x 3/8 Male to Female Reducing Bush
TF24-3412	3/4 x 1/2 Male to Female Reducing Bush
TF24-1012	1 x 1/2 Male to Female Reducing Bush
TF24-1034	1 x 3/4 Male to Female Reducing Bush

Socket - Female Hexagonal BSP



Product Code	Description
TF26-18	1/8 Female Hexagonal Socket
TF26-14	1/4 Female Hexagonal Socket
TF26-38	3/8 Female Hexagonal Socket
TF26-12	1/2 Female Hexagonal Socket
TF26-34	3/4 Female Hexagonal Socket

Reducing Nipple - Male to Male BSP



Product Code	Description
TF73-1418	1/4M - 1/8M Male to Male Reducing Nipple
TF73-3818	3/8M - 1/8M Male to Male Reducing Nipple
TF73-3814	3/8M - 1/4M Male to Male Reducing Nipple
TF73-1214	1/2M - 1/4M Male to Male Reducing Nipple
TF73-1238	1/2M - 3/8 Male to Male Reducing Nipple
TF73-3438	3/4M - 3/8 Male to Male Reducing Nipple
TF73-3412	3/4M - 1/2M Male to Male Reducing Nipple



Product Code	Description
TF64-18	1/8 BSP Taper Plug
TF64-14	1/4 BSP Taper Plug
TF64-38	3/8 BSP Taper Plug
TF64-12	1/2 BSP Taper Plug
TF64-34	3/4 BSP Taper Plug
TF64-10	1" BSP Taper Plug

End Cap - Female BSP



Product Code	Description
TF33-18	1/8 Female BSP End Cap
TF33-14	1/4 Female BSP End Cap
TF33-38	3/8 Female BSP End Cap
TF33-12	1/2 Female BSP End Cap
TF33-34	3/4 Female BSP End Cap
TF33-10	1" Female BSP End Cap

T Joiner - Male BSP



Product Code	Description
TF50-14	1/4 3-Way Male BSP Tee

**BSPT Brass / Stainless**

Product Code	Size	Height
PP10	1/8	.250
PP20	1/4	.406
PP40	3/8	.406
PP60	1/2	.531
PP80	3/4	.531
PP100	1	.656

Cross Joiner - Female BSP



Product Code	Description
TF37-14	1/4 Female BSP Cross

T Joiner - Female BSP

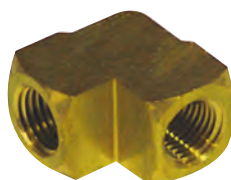


Product Code	Description
TF35-18	1/8 Female BSP Tee
TF35-14	1/4 Female BSP Tee
TF35-38	3/8 Female BSP Tee
TF35-12	1/2 Female BSP Tee
TF35-34	3/4 Female BSP Tee



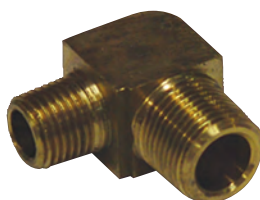
Product Code	Description
TF25E-18-45	1/8M - 1/8F Male to Female 45° Elbow
TF25E-14-45	1/4M - 1/4F Male to Female 45° Elbow
TF25E-38-45	3/8M - 3/8F Male to Female 45° Elbow
TF25E-12-45	1/2M - 1/2F Male to Female 45° Elbow

Elbow - 90° Female BSP



Product Code	Description
TF34-18	1/8 Female 90° Elbow
TF34-14	1/4 Female 90° Elbow
TF34-38	3/8 Female 90° Elbow
TF34-12	1/2 Female 90° Elbow
TF34-34	3/4 Female 90° Elbow

Elbow - 90° Male to Male BSP



Product Code	Description
TF48-1818	M1/8 - M1/8 Male to Male 90° Elbow
TF48-1414	M1/4 - M1/4 Male to Male 90° Elbow
TF48-3838	M3/8 - M3/8 Male to Male 90° Elbow
TF48-3814	M3/8 - M1/4 Male to Male 90° Elbow



Product Code	Description
TF31T8	310-Series Snap On with 1/2 Hose Tail

Air Coupler with Male BSP Thread - 310 Series



Product Code	Description
TF310-M2	310-Series Coupler with 1/8 Male BSP Thread
TF310-M4	310-Series Coupler with 1/4 Male BSP Thread
TF310-M6	310-Series Coupler with 3/8 Male BSP Thread
TF310-M8	310-Series Coupler with 1/2 Male BSP Thread

Air Coupler with Female BSP Thread - 310 Series



Product Code	Description
TF310-F4	310-Series Coupler with 1/4 Female BSP Thread
TF310-F6	310-Series Coupler with 3/8 Female BSP Thread
TF310-F8	310-Series Coupler with 1/2 Female BSP Thread



Product Code	Description
TF310-T4	T4 310-Series Coupler with Hose Tail
TF310-T6	T6 310-Series Coupler with Hose Tail
TF310-T8	T8 310-Series Coupler with Hose Tail

Air Snap on with Male BSP Thread - 310 Series

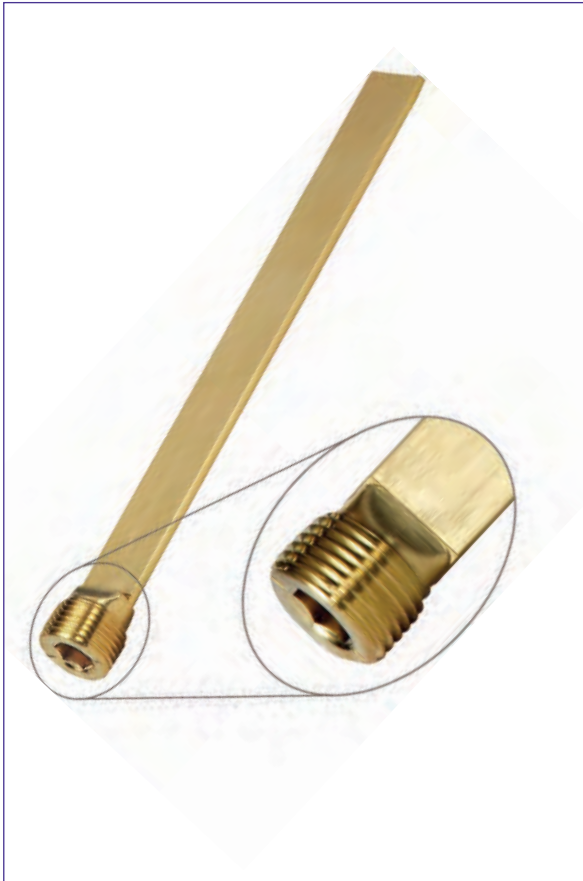


Product Code	Description
TF31-M2	310-Series Snap On with 1/8 Male BSP Thread
TF31-M4	310-Series Snap On with 1/4 Male BSP Thread
TF31-M6	310-Series Snap On with 3/8 Male BSP Thread
TF31-M8	310-Series Snap On with 1/2 Male BSP Thread

Air Snap on with Female BSP Thread - 310 Series



Product Code	Description
TF31-F4	310-Series Snap On with 1/4 Female BSP Thread
TF31-F6	310-Series Snap On with 3/8 Female BSP Thread



Extra deep socket is stronger and will not strip out

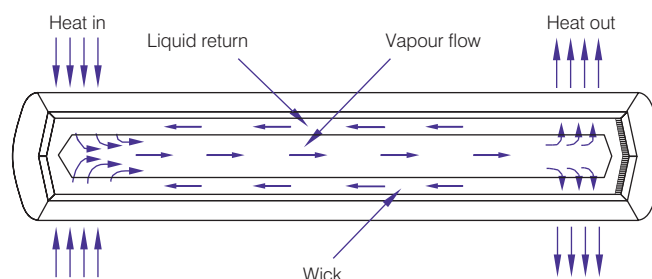
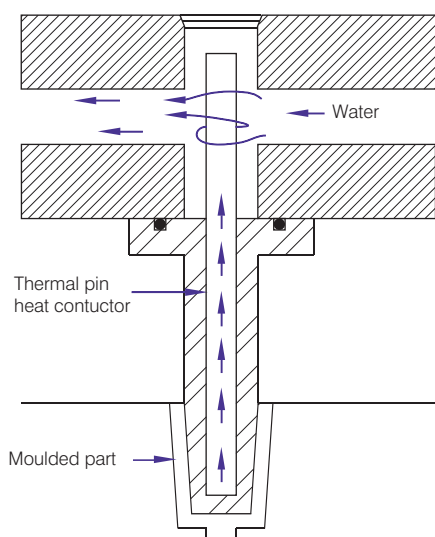
Product Code	Overall Length	NPT Plug Size	Blade-.005 Width-.015	Blade Thickness
CSB16x4	4	1/16	1/4	1/16
CSB16x8	8			
CSB18x4	4	1/8	5/16	1/16
CSB18x8	8			
CSB14x5	5	1/4	7/16	3/32
CSB14x10	10			
CSB38x6	6	3/8	9/16	3/32
CSB38x12	12			
CSB12x8	8	1/2	11/16	3/32
CSB12x16	16			
CSB34x12	12	3/4	15/16	1/8
CSB34x20	20			
CSB1x16	16	1	1 1/8	1/8
CSB1x24	24			

Baffle - Turbo Brass - NPT



Extra deep socket is stronger and will not strip out.
Spiral lengthens the cooling path and keeps the baffle centred, providing up to 11% greater flow rate.

Product Code	Overall Length	S Straight Length	NPT Plug Size	Blade-.005 Width-.015	Blade Thickness
CTB16x4	4	2	1/16	1/4	1/16
CTB16x8	8	4			
CTB18x4	4	2	1/8	5/16	1/16
CTB18x8	8	4			
CTB14x5	5	2	1/4	7/16	3/32
CTB14x10	10	4			
CTB38x6	6	2	3/8	9/16	3/32
CTB38x12	12	4			
CTB12x8	8	3	1/2	11/16	3/32
CTB12x16	16	5			
CTB34x12	12	4	3/4	15/16	1/8
CTB34x20	20	6			
CTB1x16	16	5	1	1 1/8	1/8
CTB1x24	24	8			



Heat Transfer Rods are designed to heat or cool cones, slides and inserts. Heat Transfer Rods conduct temperature over 10,000 times faster than copper.

Heat Transfer Rods operate best when 50% of the overall length is cooled using a water flow. +0.1 to +0.2mm should be up on the rod diameter for the correct fitment. Fitment hole should be drilled.

Length mm	1/4"	2mm	2.5mm	1/2"	3mm	4mm	5mm	6mm	8mm	10mm	12mm
50		HTR-02050	HTR-025050		HTR-03050	HTR-04050	HTR-05050				
55		HTR-02055									
60		HTR-02060	HTR-025060		HTR-03060	HTR-04060	HTR-05060	HTR-06060			
70		HTR-02070	HTR-025070		HTR-03070	HTR-04070	HTR-05070	HTR-06070			
75		HTR-02075	HTR-025075								
80		HTR-02080	HTR-025080		HTR-03080	HTR-04080	HTR-05080	HTR-06080			
100		HTR-02100	HTR-025100	HTR-124	HTR-03100	HTR-04100	HTR-05100	HTR-06100	HTR-08100		
105		HTR-02105									
125		HTR-02125	HTR-025125		HTR-03125	HTR-04125	HTR-05125	HTR-06125	HTR-08125	HTR-10125	
150	HTR-146					HTR-04150	HTR-05150	HTR-06150	HTR-08150	HTR-10150	HTR-12150
160											HTR-12160
165						HTR-04165					
175								HTR-06175	HTR-08175	HTR-10175	HTR-12175
200								HTR-06200	HTR-08200	HTR-10200	HTR-12200
250									HTR-08250	HTR-10250	HTR-12250
300	HTR-1412									HTR-10300	HTR-12300
350										HTR-10350	HTR-12350

Cascade Assembly



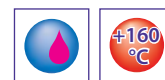
Hales Cascade Assembly includes a brass head, 12" brass tube, 2" long galvanized pipe nipple and brass pipe plug.

Product Code	Mould Nipple (NPT)	Pipe Tap Size (NPT)	Brass Tube OD	Hex Size	E	C	A	L
CM146N4	1/4	1/4	1/4	1	21/64	11/16	7/32	1 11/32

High temperature water hose
(EPDM construction)
Sold per metre with a minimum
order quantity of 10 metres



E Series



G Series



Product Code	I.D.	O.D.	Roll Length	Colour	Bend Radius	Max Temp
E10B	10mm	16.5mm	50m	BLUE	60°	160°
E10R	10mm	16.5mm	50m	RED	60°	160°
E13B	13mm	21mm	50m	BLUE	90°	160°
E13R	13mm	21mm	50m	RED	90°	160°
G13B	13mm	21mm	50m	BLUE	90°	100°
G13R	13mm	21mm	50m	RED	90°	100°
G19B	19mm	27mm	30m	BLUE	110°	100°
G19R	19mm	27mm	30m	RED	110°	100°

Hand Crimper

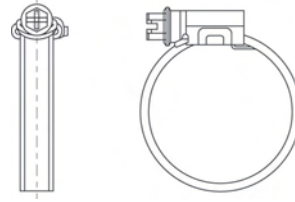


Product	Product Code	D
Hand Crimper	X100	10-36 mm

Ferrules



Product	Product Code	D	d.	Suits Hose
Ferrule	C10/17	17.5mm	10mm	G10/E10
Ferrule	C13/22	22.5mm	13mm	G13/E13
Ferrule	C19/29	29mm	19mm	G19/E19



Manufactured using a solid stainless steel band with a rolled edge and smooth underside to prevent hose damage and deliver high strength for superior sealing.

Product Code	Size	Qty in Pack
HC0816-PKT	11mm - 16mm	10
HC1320-PKT	13mm - 20mm	10
HC1524-PKT	16mm - 24mm	10
HC2238-PKT	22mm - 38mm	10

Teflon Tape

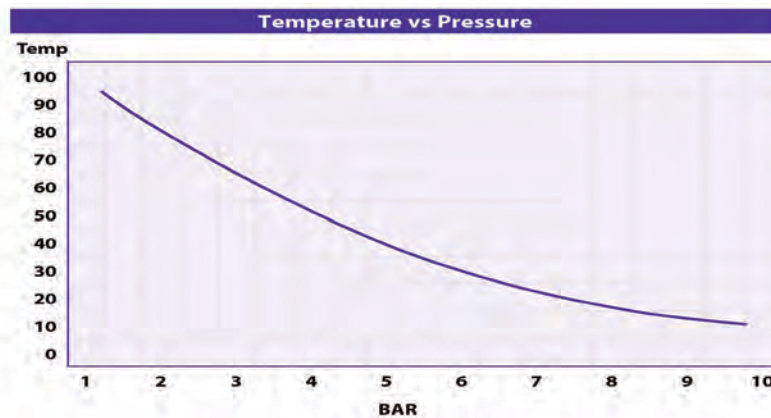


Product Code	Description
TEF	1/2 Teflon Tape

Two Ear Clips and Pincers



Product Code	Description	Size
PS01	Side Pincer	-
EAR15	ID 13-15	7.0
EAR17	ID 14-17	7.0
EAR18	ID 15-18	7.5
EAR20	ID 17-20	7.5
EAR23	ID 20-23	8.5
EAR27	ID 23-27	8.5
EAR28	ID 25-28	9.0



Product Code	Dia.	Description	Unit Size
PU04 Hose Black	4mm	Black Polyurethane Hose	1 roll = 20mtr
PU04 Hose Blue	4mm	Blue Polyurethane Hose	1 roll = 20mtr
PU05 Hose Blue	5mm	Blue Polyurethane Hose	1 roll = 20mtr
PU06 Hose Black	6mm	Black Polyurethane Hose	1 roll = 20mtr
PU06 Hose Blue	6mm	Blue Polyurethane Hose	1 roll = 20mtr
PU08 Hose Red	8mm	Red Polyurethane Hose	1 roll = 30mtr
PU08 Hose Black	8mm	Black Polyurethane Hose	1 roll = 30mtr
PU08 Hose Blue	8mm	Blue Polyurethane Hose	1 roll = 30mtr
PU10 Hose Red	10mm	Red Polyurethane Hose	1 roll = 30mtr
PU10 Hose Black	10mm	Black Polyurethane Hose	1 roll = 30mtr
PU10 Hose Blue	10mm	Blue Polyurethane Hose	1 roll = 30mtr
PU12 Hose Red	12mm	Red Polyurethane Hose	1 roll = 30mtr
PU12 Hose Black	12mm	Black Polyurethane Hose	1 roll = 30mtr
PU12 Hose Blue	12mm	Blue Polyurethane Hose	1 roll = 30mtr

Push Fitting - Threaded Tee



Product Code	Description
PB-4-01	4mm x 1/8 BSPT Threaded Tee Push Fitting
PB-4-02	4mm x 1/4 BSPT Threaded Tee Push Fitting
PB-5-01	5mm x 1/8 BSPT Threaded Tee Push Fitting
PB-5-02	5mm x 1/4 BSPT Threaded Tee Push Fitting
PB-6-01	6mm x 1/8 BSPT Threaded Tee Push Fitting
PB-6-02	6mm x 1/4 BSPT Threaded Tee Push Fitting
PB-8-01	8mm x 1/8 BSPT Threaded Tee Push Fitting
PB-8-02	8mm x 1/4 BSPT Threaded Tee Push Fitting



Product Code	Description
PC-04-01	4mm x 1/8 BSPT Threaded Straight Push Fitting
PC-04-02	4mm x 1/4 BSPT Threaded Straight Push Fitting
PC-05-01	5mm x 1/8 BSPT Threaded Straight Push Fitting
PC-05-02	5mm x 1/4 BSPT Threaded Straight Push Fitting
PC-06-01	6mm x 1/8 BSPT Threaded Straight Push Fitting
PC-06-02	6mm x 1/4 BSPT Threaded Straight Push Fitting
PC-08-01	8mm x 1/8 BSPT Threaded Straight Push Fitting
PC-08-02	8mm x 1/4 BSPT Threaded Straight Push Fitting
PC-10-02	10mm x 1/4 BSPT Threaded Straight Push Fitting
PC-12-02	12mm x 1/4 BSPT Threaded Straight Push Fitting

Push Fitting - Threaded 90°



Product Code	Description
PL-04-01	4mm x 1/8 BSPT Threaded 90° Push Fitting
PL-04-02	4mm x 1/4 BSPT Threaded 90° Push Fitting
PL-05-01	5mm x 1/8 BSPT Threaded 90° Push Fitting
PL-05-02	5mm x 1/4 BSPT Threaded 90° Push Fitting
PL-06-01	6mm x 1/8 BSPT Threaded 90° Push Fitting
PL-06-02	6mm x 1/4 BSPT Threaded 90° Push Fitting
PL-08-01	8mm x 1/8 BSPT Threaded 90° Push Fitting
PL-08-02	8mm x 1/4 BSPT Threaded 90° Push Fitting
PL-10-02	10mm x 1/4 BSPT Threaded 90° Push Fitting
PL-12-02	12mm x 1/4 BSPT Threaded 90° Push Fitting

Push Fitting - T Joiner



Product Code	Description
PE-04	4mm O.D. Tube Push Fitting
PE-05	5mm O.D. Tube Push Fitting
PE-06	6mm O.D. Tube Push Fitting
PE-08	8mm O.D. Tube Push Fitting



Product Code	Description
PY-04	4mm O.D. Y Push Fitting
PY-05	5mm O.D. Y Push Fitting
PY-06	6mm O.D. Y Push Fitting
PY-08	8mm O.D. Y Push Fitting

Push Fitting - Tube Connector - PUM



Product Code	Description
PUM-004	4mm PUM Push-In Tube Connector
PUM-006	6mm PUM Push-In Tube Connector
PUM-008	8mm PUM Push-In Tube Connector
PUM-0010	10mm PUM Push-In Tube Connector
PUM-0012	12mm PUM Push-In Tube Connector

Push Fitting - Tube Elbow - PVM

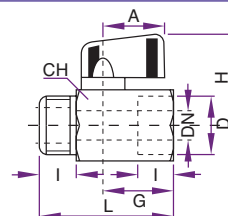
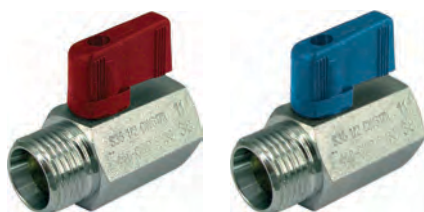


Product Code	Description
PVM-004	4mm PVM Push-In Tube Elbow
PVM-006	6mm PVM Push-In Tube Elbow
PVM-008	8mm PVM Push-In Tube Elbow
PVM-0010	10mm PVM Push-In Tube Elbow
PVM-0012	12mm PVM Push-In Tube Elbow



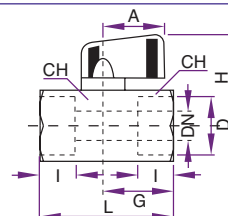
Product Code	Description
AIRGUN	Blow Gun (Red) Air Boy

Ball Valve Mini - Male / Female

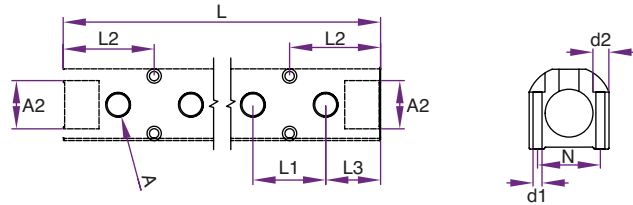


Part No.	Part No.	D	DN	I	L	G	A	H	CH
VMMF02R	VMMF02B	1/8"	5	10	41,5	22	22,5	31	21
VMMF04R	VMMF04B	1/4"	8	11	41,5	22	22,5	31	21
VMMF06R	VMMF06B	3/8"	8	11	41,5	22	22,5	31	21
VMMF08R	VMMF08B	1/2"	10	13	49	22	22,5	31	25

Ball Valve Mini - Female / Female

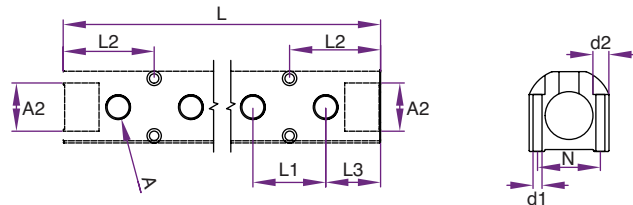


Part No.	Part No.	D	DN	I	L	G	A	H	CH
VM02R	VM02B	1/8"	6	10	41,5	22	22,5	31	21
VM04R	VM04B	1/4"	8	11	41,5	22	22,5	31	21
VM06R	VM06B	3/8"	8	11	41,5	22	22,5	31	21
VM08R	VM08B	1/2"	10	13	49	26	22,5	31	25

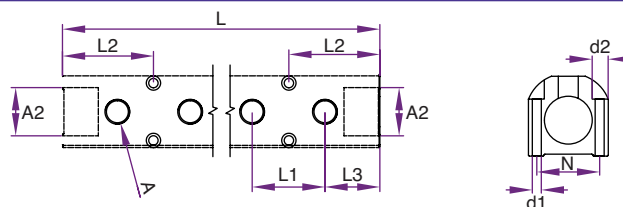


Part No.	Colour	Ports	A(BSPP)	A2(BSPP)	L2	L3	L1	d1	d2	N	L
IM3-4-1/4-R	Red	4	1/4"	3/4"	57,2	38,1	38,1	4,5	8	31	109,5
IM3-4-1/4-B	Blue	4	1/4"	3/4"	57,2	38,1	38,1	4,5	8	31	190,5
IM3-6-1/4-R	Red	6	1/4"	3/4"	57,2	38,1	38,1	4,5	8	31	266,7
IM3-6-1/4-B	Blue	6	1/4"	3/4"	57,2	38,1	38,1	4,5	8	31	266,7
IM3-8-1/4-R	Red	8	1/4"	3/4"	57,2	38,1	38,1	4,5	8	31	342,9
IM3-8-1/4-B	Blue	8	1/4"	3/4"	57,2	38,1	38,1	4,5	8	31	342,9

Manifold 1" - Inline Anodised

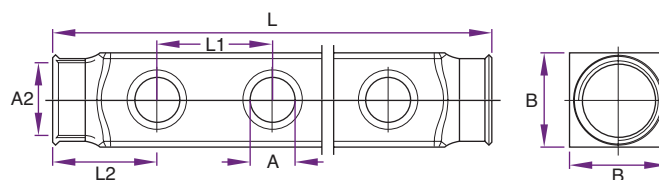


Part No.	Colour	Ports	A(BSPP)	A2(BSPP)	L2	L3	L1	d1	d2	N	L
IM4-4-1/4-R	Red	4	1/4"	1"	63,5	38,1	38,1	7	10,5	40,6	190,5
IM4-4-1/4-B	Blue	4	1/4"	1"	63,5	38,1	38,1	7	10,5	40,6	190,5
IM4-4-3/8-R	Red	4	3/8"	1"	63,5	38,1	38,1	7	10,5	40,6	228,6
IM4-4-3/8-B	Blue	4	3/8"	1"	63,5	38,1	38,1	7	10,5	40,6	228,6
IM4-6-1/4-R	Red	6	1/4"	1"	63,5	38,1	38,1	7	10,5	40,6	226,7
IM4-6-1/4-B	Blue	6	1/4"	1"	63,5	38,1	38,1	7	10,5	40,6	226,7
IM4-6-3/8-R	Red	6	3/8"	1"	63,5	38,1	38,1	7	10,5	40,6	330,2
IM4-6-3/8-B	Blue	6	3/8"	1"	63,5	38,1	38,1	7	10,5	40,6	330,2
IM4-8-1/4-R	Red	8	1/4"	1"	63,5	38,1	38,1	7	10,5	40,6	342,9
IM4-8-1/4-B	Blue	8	1/4"	1"	63,5	38,1	38,1	7	10,5	40,6	342,9
IM4-8-3/8-R	Red	8	3/8"	1"	63,5	38,1	38,1	7	10,5	40,6	431,8
IM4-8-3/8-B	Blue	8	3/8"	1"	63,5	38,1	38,1	7	10,5	40,6	431,8
IM4-10-3/8-R	Red	10	3/8"	1"	63,5	38,1	38,1	7	10,5	40,6	533,4
IM4-10-3/8-B	Blue	10	3/8"	1"	63,5	38,1	38,1	7	10,5	40,6	533,4
IM4-12-3/8-R	Red	12	3/8"	1"	63,5	38,1	38,1	7	10,5	40,6	635
IM4-12-3/8-B	Blue	12	3/8"	1"	63,5	38,1	38,1	7	10,5	40,6	635

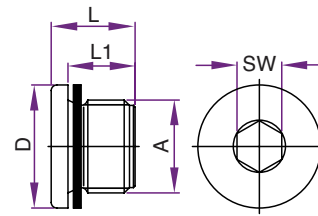


Part No.	Colour	Ports	A(BSPP)	A2(BSPP)	L2	L3	L1	d1	d2	N	L
IM6-4-1/2-R	Red	4	1/2"	1-1/2"	76,2	50,8	50,8	7	10,5	57	254
IM6-4-1/2-B	Blue	4	1/2"	1-1/2"	76,2	50,8	50,8	7	10,5	57	254
IM6-6-1/2-R	Red	6	1/2"	1-1/2"	76,2	50,8	50,8	7	10,5	57	355,6
IM6-6-1/2-B	Blue	6	1/2"	1-1/2"	76,2	50,8	50,8	7	10,5	57	355,6
IM6-8-1/2-R	Red	8	1/2"	1-1/2"	76,2	50,8	50,8	7	10,5	57	457,2
IM6-8-1/2-B	Blue	8	1/2"	1-1/2"	76,2	50,8	50,8	7	10,5	57	457,2
IM6-10-1/2-R	Red	10	1/2"	1-1/2"	76,2	50,8	50,8	7	10,5	57	558,8
IM6-10-1/2-B	Blue	10	1/2"	1-1/2"	76,2	50,8	50,8	7	10,5	57	558,8
IM6-12-1/2-R	Red	12	1/2"	1-1/2"	76,2	50,8	50,8	7	10,5	57	660,4
IM6-12-1/2-B	Blue	12	1/2"	1-1/2"	76,2	50,8	50,8	7	10,5	57	660,4

Manifold - Stainless Steel



Part No.	Ports	A (BSPP)	A2 (BSPP)	L	L1	L2	B
SSIM4-4-1/2	4	1/2"	1"	240	50	45	40
SSIM4-6-1/2	6	1/2"	1"	340	50	45	40
SSIM4-8-1/2	8	1/2"	1"	440	50	45	40
SSIM4-10-1/2	10	1/2"	1"	540	50	45	40
SSIM4-12-1/2	12	1/2"	1"	640	50	45	40
SSIM5-4-1/2	4	1/2"	1-1/4"	240	50	45	50
SSIM5-6-1/2	6	1/2"	1-1/4"	340	50	45	50
SSIM5-8-1/2	8	1/2"	1-1/4"	440	50	45	50
SSIM5-10-1/2	10	1/2"	1-1/4"	540	50	45	50
SSIM5-12-1/2	12	1/2"	1-1/4"	640	50	45	50



* With O-Ring

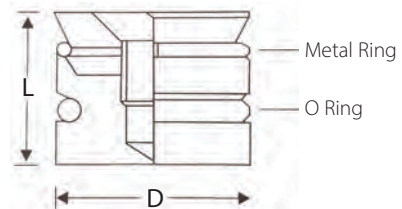
Part No.	A	D	L	L1	SW	VPE
DR3/4	G3/4"	32	21	16	12	1
DR1	G1"	40	22,5	16	17	1
DR1-1/2*	G1-1/2"	55	22,5	16	24	1

Brackets for Stainless Steel Manifolds

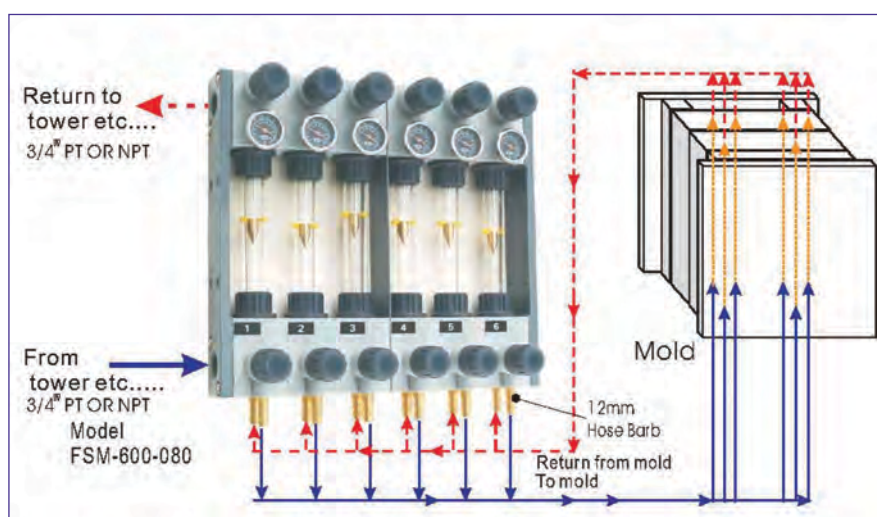
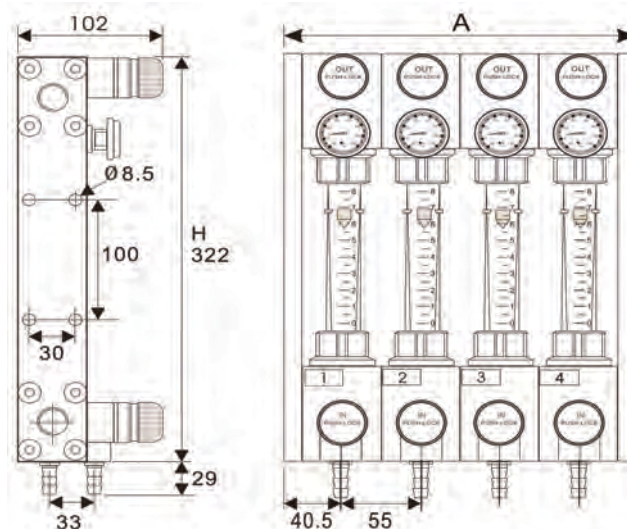


Part No.	Type
SS-Bracket	1"
SS-5-Bracket	1-1/4"
SS-6 Bracket	1-1/2"

Water Plug - Threadless



Product Code	Length (L)	Diameter (D)	Temperature Rating
TWPM-06	10	6mm	< 100°C
TWPM-08	10	8mm	< 100°C
TWPM-10	10	10mm	< 100°C
TWPM-12	12	12mm	< 100°C
TWPM-14	13	14mm	< 100°C
TWPM-16	14	16mm	< 100°C



Water Flow Regulator

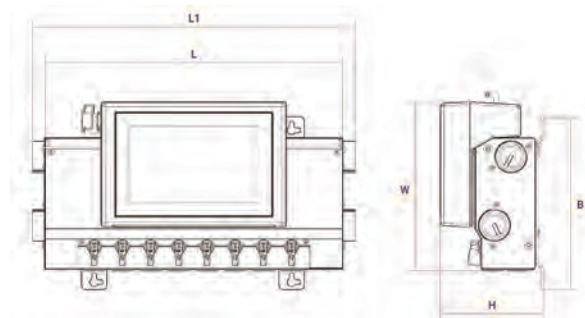
- Regulates water flow and water outlet temperature
- Individual zones sold separately
- Quality heavy duty construction
- Polyamide nylon flow tube
- Flow meter gauge for each tube
- Water temperature gauge for each tube
- Flow - 8 Lt per Minute per zone

Product Code	Zones	A (Width mm)	Depth (mm)	Height (mm)
FSM 100	1	75	105	351
FSM 200	2	130	105	351
FSM 300	3	185	105	351
FSM 400	4	245	105	351
FSM 600	6	358	105	351
FSM 800	8	468	105	351
FSM 1200	12	690	105	351



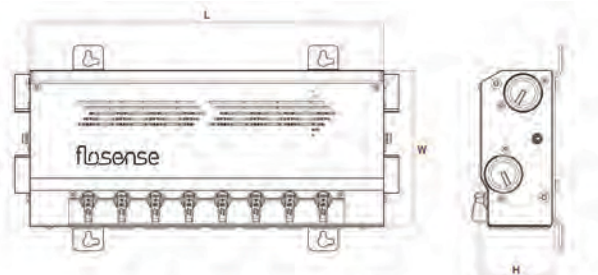
Flosense® Monitor Provides visibility of key cooling circuit metrics, improves efficiency, enhances productivity and profitability.

Product Code	Input	Size	Readability	Voltage	Alarm Output
FS-7100	4	7,1"	OPC-UA	12V	Yes



Flosense® Flow Regulator.

Product Code	Main Thread	Flow Capacity	BSPP In.	Port	L1	B	Temp
FFRM4-1-20	1"G	1-20 l/m	1/2"G	4	250 mm	205 mm	120°
FFRM4-2-40	1"G	2-40 l/m	1/2"G	4	250 mm	205 mm	120°
FFRM6-1-20	1"G	1-20 l/m	1/2"G	6	317 mm	205 mm	120°
FFRM6-2-40	1"G	2-40 l/m	1/2"G	6	317 mm	205 mm	120°
FFRM8-1-20	1"G	1-20 l/m	1/2"G	8	384 mm	205 mm	120°
FFRM8-2-40	1"G	2-40 l/m	1/2"G	8	384 mm	205 mm	120°
FFRM10-1-20	1"G	1-20 l/m	1/2"G	10	451 mm	205 mm	120°
FFRM10-2-40	1"G	2-40 l/m	1/2"G	10	451 mm	205 mm	120°
FFRM12-1-20	1"G	1-20 l/m	1/2"G	12	518 mm	205 mm	120°
FFRM12-2-40	1"G	2-40 l/m	1/2"G	12	518 mm	205 mm	120°



Flosense® Manifold.

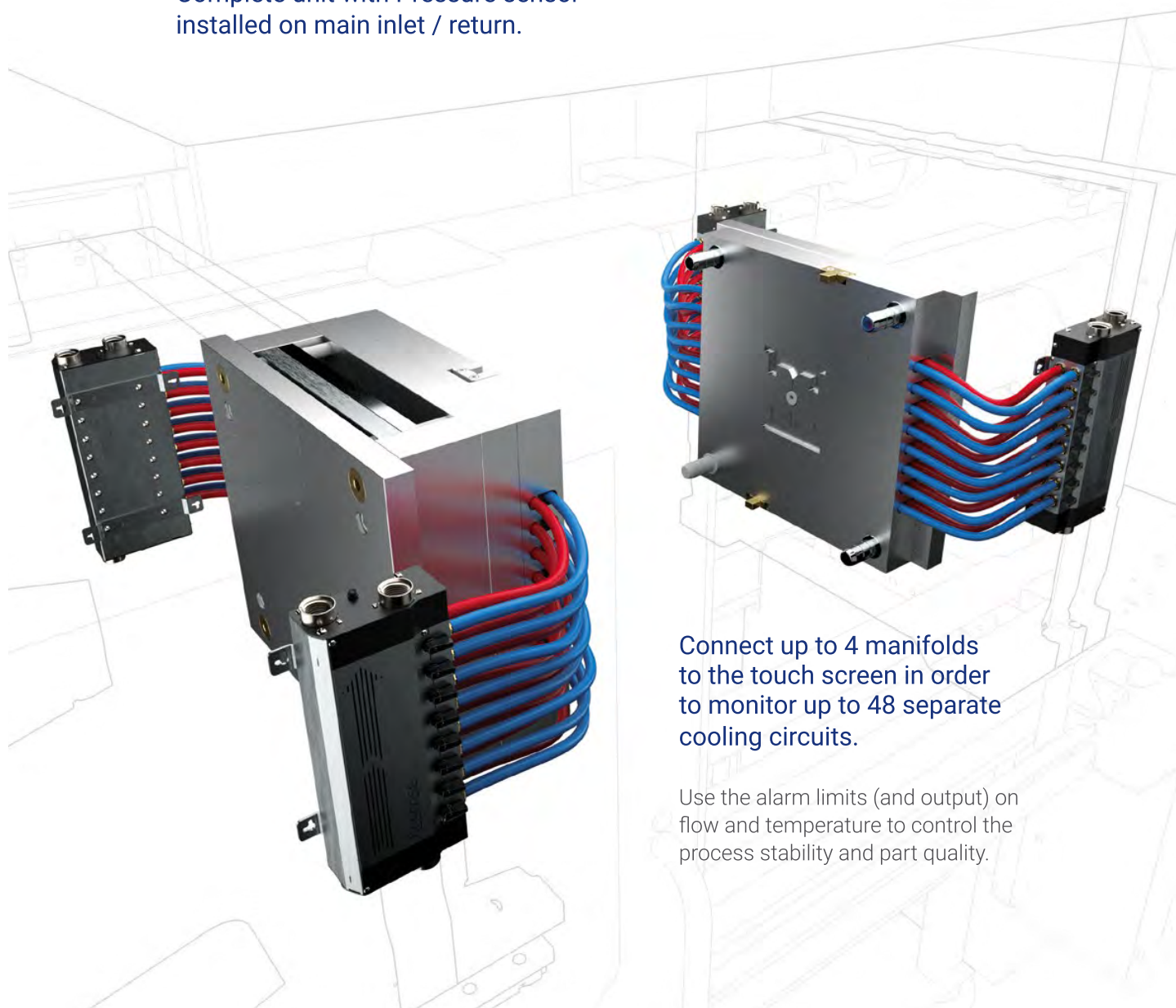
Product Code	Port	Flow	Height	Length	Width	Max Temp
F4M4-1-20	4	1-20 l/m	72	220	155	120°
F4M4HT-1-20	4	1-20 l/m	72	220	155	160°
F4M4-2-40	4	2-40 l/m	72	220	155	120°
F4M4HT-2-40	4	2-40 l/m	72	220	155	160°
F4M6-1-20	6	1-20 l/m	72	287	155	120°
F4M6HT-1-20	6	1-20 l/m	72	287	155	160°
F4M6-2-40	6	2-40 l/m	72	287	155	120°
F4M6HT-2-40	6	2-40 l/m	72	287	155	160°
F4M8-1-20	8	1-20 l/m	72	354	155	120°
F4M8HT-1-20	8	1-20 l/m	72	354	155	160°
F4M8-2-40	8	2-40 l/m	72	354	155	120°
F4M8HT-2-40	8	2-40 l/m	72	354	155	160°
F4M10-1-20	10	1-20 l/m	72	421	155	120°
F4M10HT-1-20	10	1-20 l/m	72	421	155	160°
F4M10-2-40	10	2-40 l/m	72	421	155	120°
F4M10HT-2-40	10	2-40 l/m	72	421	155	160°
F4M12-1-20	12	1-20 l/m	72	488	155	120°
F4M12HT-1-20	12	1-20 l/m	72	488	155	160°
F4M12-2-40	12	2-40 l/m	72	488	155	120°
F4M12HT-2-40	12	2-40 l/m	72	488	155	160°

flosense 4.0



MANIFOLD

Complete unit with Pressure sensor installed on main inlet / return.



Connect up to 4 manifolds to the touch screen in order to monitor up to 48 separate cooling circuits.

Use the alarm limits (and output) on flow and temperature to control the process stability and part quality.

Hales has a large range of Smartflow® Flow Regulators and can facilitate custom made configurations to order.

MECHANICAL FLOW REGULATORS

Compact solid brass or aluminium construction with Polysulfone windows.

- Temperature rating 115°C
- Anodized corrosion resistance
- Pressure rated to 100 psi (6.89 bar)
- Optional thermometer and pressure gauge
- Liquid-filled pressure gauge also available

FLOW REGULATORS

Inline or manifold mounted

- Leak free design
- Solid Brass Body
- Needle valve control
- Optional Temperature gauge
- Temperature rating to 115°C
- Pressure rated to 150psi (10.34 bar)



HOT WATER/OIL FLOWMETERS

Stainless steel construction to 288°C

- Throughput 6 gpm (us)
- Temperature rating to 288°C
- All stainless steel construction
- Pressure rate to 150 psi (10.34 bar)

TRACER® ELECTRONIC FLOWMETERS

Digital process control, local and remote signal outputs

- All model 3/8" to 2" BSP(P) supply
- 2-418 litres per minute
- Display of Temperature, Flow and BTU's
- Temperature and flow alarms
- Local display, remote alarm*, and variable output*
- Temperature rating to 110°C
- 100 psi (6.89 bar) or 150 psi (10.34 bar) 3/8" only



DELTA-Q® MODULAR FLOW REGULATOR

Delta-Q® Modular Flow Regulator is used in conjunction with other Smartflow® components such as threaded end caps, flowmeters, temperature and pressure gauges, Tracer Electronic Flowmeters or Dr. Eddy® Turbulent Flow Indicators. The Delta-Q® Regulator allows full adjustability of flow volume from unrestricted flow to complete shut off using the manual flow control knob.

- Compact size works well in restricted-space locations
- Rugged construction gives years of dependable service
- 210°F (99°C) Temperature Rating allows installation into a wide range of applications
- Common Flowmeter Configurations Stocked to provide same-day delivery in many cases
- No Mounting Restrictions ease installation in any position without extra brackets or hardware
- Leak-Free installation is based on proven flowmeter design





* Dimension : 193 x 71 x 225mm

No. of Zones	Description	Mastip Code	Power Input	Output Connector	
				Power Connector	TC Connector
1	CIS - 1	79-060-010	230V 1P	1 x 5 Pin Female Single Latch, Power & TC Combination	

Temperature Controller - Meticom 2 Zone



* Dimension : 193 x 71 x 225mm

No. of Zones	Description	Mastip Code	Power Input	Output Connector	
				Power Connector	TC Connector
2	CIS - 2	79-060-020	230V 1P	2 x 5 Pin Female Single Latch, Power & TC Combination	

Temperature Zone Controller



HRTC-B1 zone controller is a user friendly unit with an LED display that is compatible with most leading hot runner brands.

- Heavy duty connectors (rated 10A or 16A)
- Built-in cooling fan, circuit breaker and power input cable.
- Neon indicators illuminate after power on.
- Warning system to include fuse blowout, over load, thermocouple open/reverse, temperature, heater fault, high load etc.

Product Code	Description
HRTC-B1	Zone Controller



- Unique Construction
- LED display
- Fuzzy pid control
- Two temperature scales selectable (C° / F°)
- Two thermocouple types (J or K)
- Output type: zero cross or phase angle
- can be installed on floor stand
- Cabinet zones: 5, 8 or 12
- Universal size for North American standard
- Easy operation & convenient replacement.
- Auto or manual function
- Dehumidify soft start function
- High / low temperature alarm
- Thermocouple open, reverse, short alarm
- Heater open, short, overload alarm
- Over voltage protection function
- Remote standby function (optional)
- Alarm output function (optional)

Product Code	Description
MAS-MFX5	5 Zone Mainframe
MAS-MFX8	8 Zone Mainframe
MAS-MFX12	12 Zone Mainframe



Product Code	Description
PIM1BX10	10 Amp Unit

Temperature Control - Multi Zone Systems



16 to 48 Zone Mainframes are also available to order • 30 Amp option also available • Modules sold separately.

Product Code	Description
MFFMP2	2 Zone Mainframe
MFFMP3	3 Zone Mainframe
MFX5	5 Zone Mainframe
MFX8	8 Zone Mainframe
MFX12	12 Zone Mainframe

Hot Runner Controllers - RMA Modular



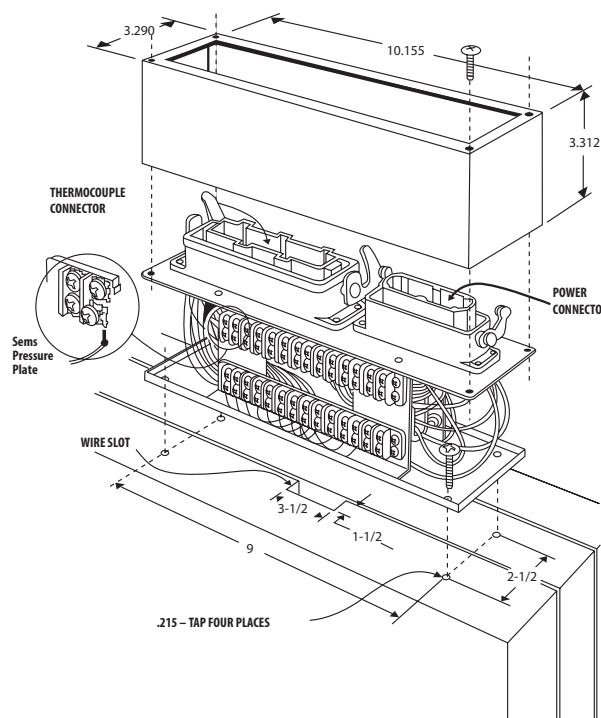
RMA Module

- Simultaneous digital setpoint and digital temperature indication.
- Accepts Type J or Type K thermocouple input (jumper selectable).
- Auto-tuning, with adjustable proportional band and rate.
- Bumpless auto/manual transfer.
- CompuStep bakeout feature prevents moisture at start-up.
- Built-in loop break, short, open, and reverse thermocouple protection.
- Jumper-selectable self-start mode.
- Current monitor feature displays average current to load.
- CE-compliant.

Product Code
RMAX15



1. The terminal blocks are completely prewired to both the Power and Thermocouple Connectors.
2. Terminal blocks are numbered by MOLD ZONE for ease of installation and troubleshooting.
3. Feed the wires from the mould wire slot through the opening(s) in the bottom of the Mould Wiring System. Slide the mould wires under the SEMS pressure plate on the appropriate zone-numbered terminal.
4. The RED and WHITE wires are the THERMOCOUPLE SIDE. Install thermocouple wire from the mould.+(White/upper) -(Red/lower) to the corresponding zone number on the upper and lower terminal blocks.
5. Install the POWER wires on the opposite two terminal blocks marked Power side to corresponding number on the terminal blocks, one to upper and one to lower.
6. Place the cover over the Mould Wiring System and tighten with the four screws supplied.



Product Code	Zones	Length Y	Width X	Height H	Mounting Hole M1	Mounting Hole M2
PTBC005-A	005	8.66"	2.75"	4.50"	1.500	8.031
PTBC008-A	008	9.47"	2.75"	4.50"	1.500	8.843
PTBC012-A	012	10.53"	2.75"	4.50"	1.500	9.906

Module Fuses



Product Code	Amps
ABC10	10
ABC15	15



Product Code	Amps
HWCC-1	15
HWCC-2	30

Blank Panel



Must be used to cover unused zones in main frames. Supplied with push-pull panel fasteners.

Product Code
MFBP

Universal Floor Stand



Product Code	Zones
MFS5812	Adjustable for 5, 8 & 12 zone



5 pin combination Thermocouple/Power Cable.

Product Code	Length
MPTC10	10'
MPTC20	20'

Power Cables

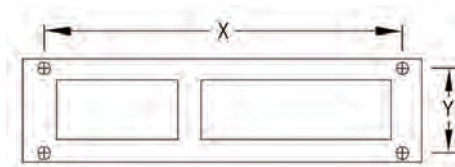


Product Code	Zones	Length
MPC5C10	5 Zones	10'
MPC5C20	5 Zones	20'
MPC8C10	8 Zones	10'
MPC8C20	8 Zones	20'
MPC12C10	12 Zones	10'
MPC12C20	12 Zones	20'

Thermocouple Cables



Product Code	Zones	Length
TC5C10	5 Zones	10'
TC5C20	5 Zones	20'
TC8C10	8 Zones	10'
TC8C20	8 Zones	20'
TC12C10	12 Zones	10'
TC12C20	12 Zones	20'



Product Code	International Code	Pin	Box Dimension L x W x H	Screw Distance X Y	
79-010-701	PTC5TB	1 x 25, 1 x 10 pin	220 x 70 x 108mm	204mm	38mm
79-010-702	PTC8TC	1 x 25, 1 x 16 pin	240.5 x 70 x 108mm	224.6mm	38mm
79-010-703	PTC12TB	1 x 25, 1 x 24 Pin	267.5 x 70 x 108mm	251.6mm	38mm

Thermocouple Connectors



Product Code	Description	Zones
MTC5	Mould Thermocouple Connector	5 Zones
MTC8	Mould Thermocouple Connector	8 Zones
MTC12	Mould Thermocouple Connector	12 Zones

Mould Power Input Connectors



Product Code	Description	Zones
PIC5	Mould Power Connector	5 Zones
PIC8	Mould Power Connector	8 Zones
PIC12	Mould Power Connector	12 Zones

**CKPTM1**

Cable, Frame End
5-Pin Combo Mould Power/ Thermocouple Connectors

Product Code

CKPTM-1

**CKPTOC1**

Frame
5-Pin Combo Mould Power/ Thermocouple Connectors

Product Code

CKPTOC-1

**CKPTF1**

Cable, Mould-End
5-Pin Combo Mould Power/ Thermocouple Connectors

Product Code

CKPTF-1

**CKPTIC1**

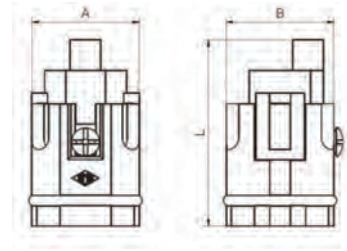
Mould
5-Pin Combo Mould Power/ Thermocouple Connectors

Product Code

CKPTIC-1



**Inserts Male
CKM**



Product Code	#Poles	A	B	L	Size
CKM03	3+E	21	21	30,5	21.21
CKM04	4+E	21	21	36,5	21.21



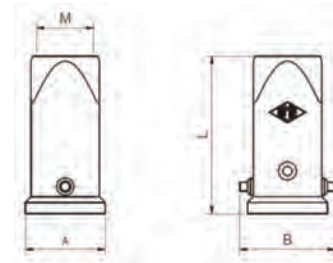
**Inserts Female
CKF**



Product Code	#Poles	A	B	L	Size
CKF03	3+E	21	21	30,5	21.21
CKF04	4+E	21	21	36,5	21.21



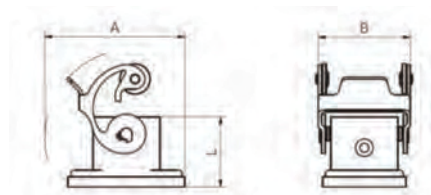
**Straight Hood
MKAV**



Product Code	#Poles	Levers	A	B	L	M	Size
MKAV20	3/4+E	Single	28	33,5	60,5	M20	21.21



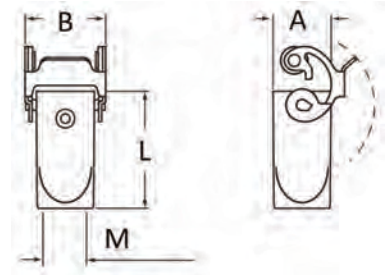
**Panel Mount Base
CKAX**



Product Code	#Poles	Levers	A	B	L	Size
CKAV031	3/4+E	Single	57,5	32	24	21.21



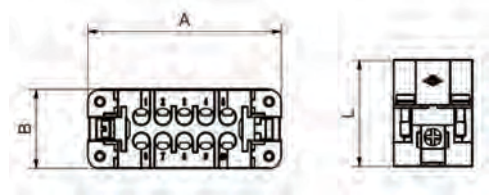
Straight Hood, Single Lever
MKAXVG



Product Code	#Poles	Levers	A	B	L	Size
MKAXVG20	3/4+E	Single	24	33	51,5	21.21



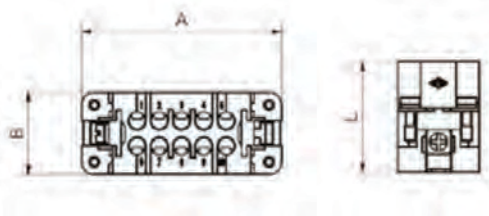
Inserts Male, Screw Terminals
CDAM



Product Code	#Poles	A	B	L	Size
CDAM10	10	56,5	23	31	49.16
CDAM16	16	73	23	31	66.16



Inserts Female, Screw Terminals
CDAF



Product Code	#Poles	A	B	L	Size
CDAF10	10	56,5	23	31	49.16
CDAF16	16	73	23	31	66.16



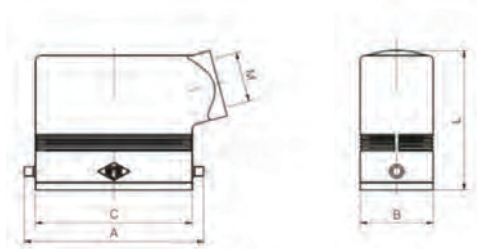
Top Entry Hood, Single Lever
MZAV



Product Code	#Poles	Levers	A	B	C	L	L1	M	Size
MZAV15L20	10	Single	72	36	63	64,5	14,5	M20	49.16
MZAV25L20	16/25	Single	88,5	36	79,5	70,5	14,5	M20	66.16
MZAV25L25	16/25	Single	88,5	36	79,5	70,5	14,5	M25	66.16



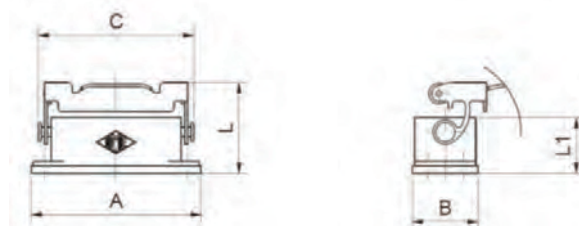
Side Entry Hood, Single Lever
MZO



Product Code	#Poles	Levers	A	B	C	L	M	Size
MZO15L20	10	Single	72	29,4	63	55,9	M20	49.16
MZO25L25	16	Single	88,5	29,4	79,5	55,9	M25	66.16



Panel Mount Housing, Single Lever
CZI



Product Code	#Poles	Levers	A	B	C	L	Size
CZI15L	10	Single	83	32	76	44	49.16
CZI25L	16/25	Single	98	32	93	44	66.16



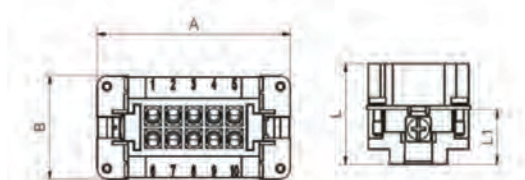
Surface Mount Housing, Single Lever
MZP, MZAP



Product Code	#Poles	Levers	A	B	C	L	M	Size
MZP15L25	10	Single	85	50	76	52	M25	49.16
MZAP25L25	16/25	Single	101	50	93	57	M25	66.16



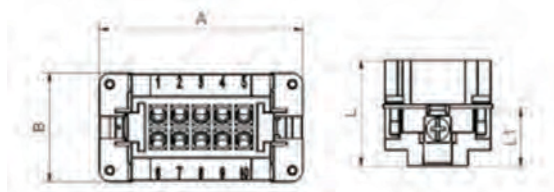
Inserts Male
CNEM



Product Code	#Poles	A	B	L	L1	Size
CNEM06T	6	50	34	33	18	44.27
CNEM10T	10	63,4	34	33	18	57.27
CNEM16T	16	83,5	34	33	18	77.27
CNEM24T	24	110,3	34	33	18	104.27



**Inserts Female
CNEF**



Product Code	#Poles	A	B	L	L1	Size
CNEF06T	6	50	34	33	18	44.27
CNEF10T	10	63,4	34	33	18	57.27
CNEF16T	16	83,5	34	33	18	77.27
CNEF24T	24	110,3	34	33	18	104.27



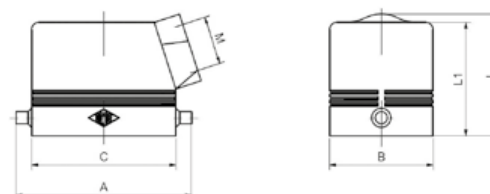
**Top Entry Hood, Single Lever
MHV**



Product Code	#Poles	Levers	A	B	C	L	L1	M	Size
MHV06L25	6	Single	72	43	60	53	40	M20	44.27
MHV10L20	10	Single	87	43	73	58	45	M20	57.27
MHV16L25	16	Single	108	43	93,5	58	45	M25	77.27
MHV24L32	24	Single	135	43	120	68	55	M32	104.27
MHV48L32	48	Single	150,5	90	121	121	98	M40	104.62



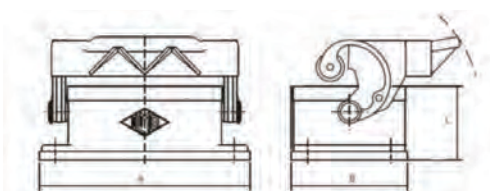
**Side Entry Hood, Single Lever
MHO**



Product Code	#Poles	Levers	A	B	C	L	L1	M	Size
MHO06L20	6	Single	73	43	60	50,4	47	M20	44.27
MHO10L20	10	Single	87	43	73	52	49	M20	57.27
MHO16L25	16	Single	108	43	93,5	63	60	M25	77.27
MHO24L32	24	Single	135	43	120	63	60	M32	104.27
MHO48L32	48	Single	150,5	90	121	98	118	M40	104.62



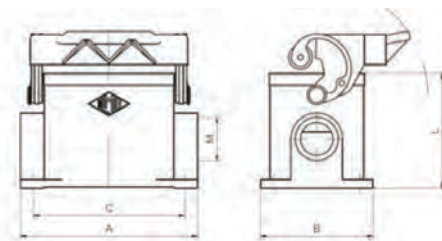
**Panel Mount Base, Single Lever
CHI**



Product Code	#Poles	Levers	A	B	L	Size
CHI06L	6	Single	82,5	45,5	29	44.27
CHI10L	10	Single	95,5	45,5	29	57.27
CHI16L	16	Single	115,5	45,5	29	77.27
CHI24L	24	Single	142,5	45,5	29	104.27
CHI48L	48	Single	167,5	93	42	104.62



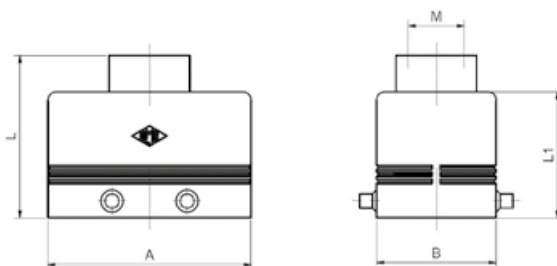
**Surface Mount Base, Single Lever
MHP**



Product Code	#Poles	Levers	A	B	C	L	M	Size
MHP06L20	6	Single	82	52	70	53	M20	44.27
MHP10L20	10	Single	93,5	52	82	57	M20	57.27
MHP16L25	16	Single	117	57	105	63	M25	77.27
MHP24L25	24	Single	144	57	132	63	M25	104.27



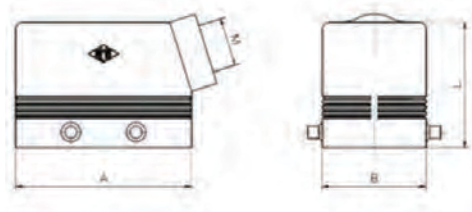
**Top Entry Hood, Double Lever
MHV**



Product Code	#Poles	Levers	A	B	L	L1	M	Size
MHV10.20	10	Double	73	43	58	45	M20	57.27
MHV16.25	16	Double	93,5	43	58	45	M25	77.27
MHV24.32	24	Double	120	43	68	55	M32	104.27
MHV32.32	32	Double	93,5	82,5	117	94	M32	77.62



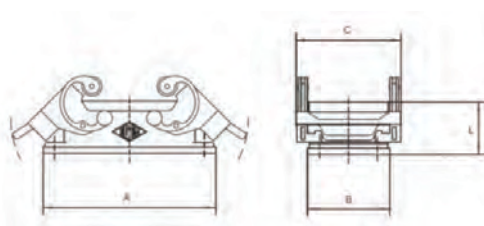
**Side Entry Hood, Double Lever
MHO**



Product Code	#Poles	Levers	A	B	L	M	Size
MHO10.20	10	Double	73	43	52	M20	57.27
MHO16.25	16	Double	93,5	43	63	M25	77.27
MHO24.32	24	Double	120	43	63	M32	104.27
MHO32.32	32	Double	93,5	82,5	94	M32	77.62



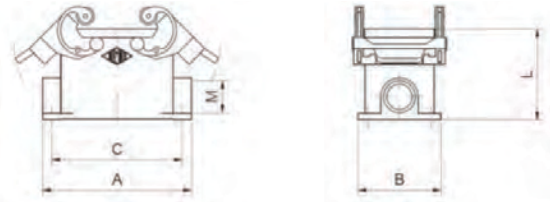
**Panel Mount Base, Double Lever
CHI**



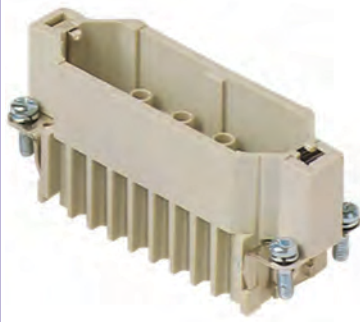
Product Code	#Poles	Levers	A	B	C	L	Size
CHI10	10	Double	95,5	45,5	58	29	57.27
CHI16	16	Double	115,5	45,5	58	29	77.27
CHI24	24	Double	142,5	45,5	58	29	104.27
CHI32	32	Double	126	45,5	98,5	35	77.62



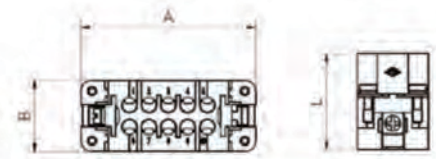
**Surface Mount Base, Double Lever
MHP**



Product Code	#Poles	Levers	A	B	C	L	M	Size
MHP10.20	10	Double	93,5	52	82	57	M20	57.27
MHP16.25	16	Double	117	57	105	63	M25	77.27
MHP24.25	24	Double	144	57	132	63	M25	104.27
MHP32.40	32	Double	125	84	112	90	M40	77.62



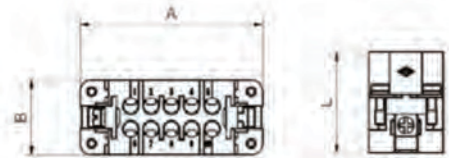
**Inserts Male, 3 Row, High Density Crimp Terminal
CDM**



Product Code	#Poles	A	B	L	Size
CDM25	25	73	23	31	66.16



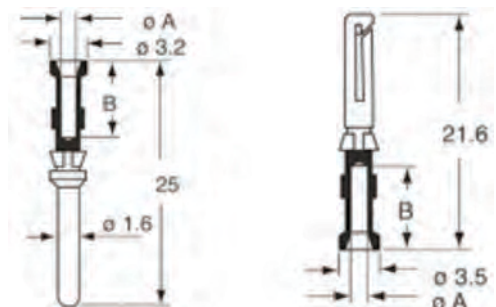
**Inserts Female, 3 Row, High Density Crimp Terminal
CDM**



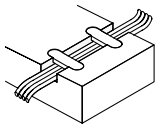
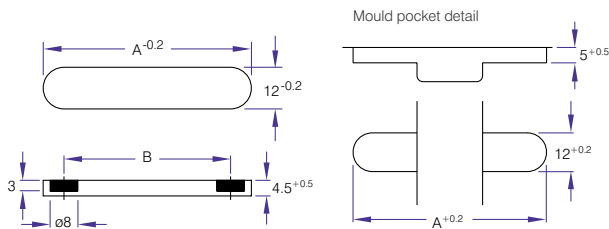
Product Code	#Poles	A	B	L	Size
CDM25	25	73	23	31	66.16



**Crimp
CDMA/CDFA**



Product Code	Type	Wire Size	Ø-A	Ø-B
CDMA0.5	Male	0,5mm ²	1,1	8
CDFA0.5	Female	0,5mm ²	1,1	8
CDMA1.5	Male	1,5mm ²	1,8	8
CDFA1.5	Female	1,5mm ²	1,8	8

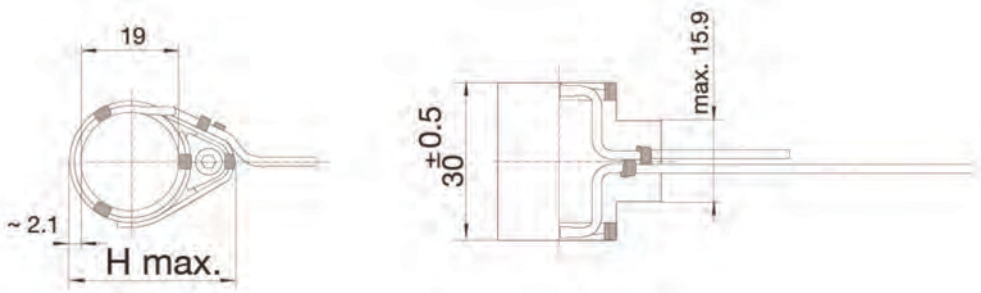


Product Code	A	B	Material	Max Temp
SC.401245	40	28	100	80°C
SC.601245	60	48	100	80°C

Micro Coil Heaters

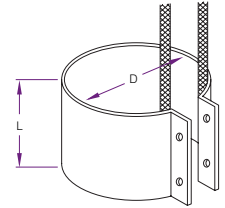


Microcoil heaters with axial screwed clamp band.



Product Code	ID	L	Watts
WRP149	19	30	149w
WRP268	19	30	268w

- Low profile flexible leads
- Premium MICA insulation
- Stainless bands
- Welded style made to order
- Other sizes made to order



Product Code	D	L	Watts
BH2525	25	25	125w
BH2538	25	38	150w
BH3030	30	30	150w
BH3040	30	40	125w
BH3075	30	75	300w
BH3225	32	25	115w
BH3232	32	32	150w
BH3238	32	38	180w
BH3250	32	50	250w
BH3275	32	75	300w
BH3538	35	38	200w
BH3838	38	38	200w
BH3850	38	50	300w
BH3875	38	75	400w
BH4030	40	30	200w
BH4038	40	38	220w
BH4060	40	60	300w
BH4090	40	90	350w
BH5038	50	38	250w
BH5050	50	50	300w
BH5075	50	75	400w
BH6060	60	60	275w

Custom Band and Barrel Heaters



Made to Order

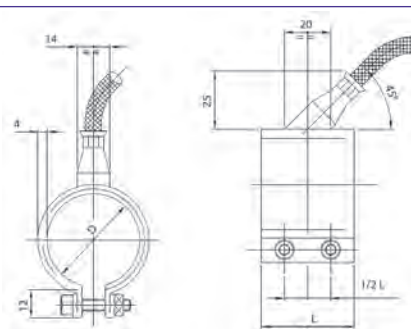
Band and Barrel Heaters made to your requirements. Ask for our custom heater form to fill in.

Scan this QR Code to Download a Custom Form

Coil Heaters - Special



Made to order from stock with and without thermocouple
Manufactured in-house, specify ID and length.



- Sealed band heater
- Tear resistant power cable
- Standard cable outlet: axial 45°
- Special sizes made to order

* These sizes available on request

Product Code	D	L	Watts	Availability
PRMX-2525	25	25	85	Stock Line
PRMX-2535	25	35	125	Stock Line
PRMX-3020	30	20	100	*
PRMX-3025	30	25	130	*
PRMX-3030	30	30	160	Stock Line
PRMX-3035	30	35	200	*
PRMX-3040	30	40	165	Stock Line
PRMX-3050	30	50	275	Stock Line
PRMX-3238	32	38	195	Stock Line
PRMX-3525	35	25	160	*
PRMX-3530	35	30	200	*
PRMX-3535	35	35	195	Stock Line
PRMX-3540	35	40	195	Stock Line
PRMX-3545	35	45	310	*
PRMX-3825	38	25	140	Stock Line
PRMX-3838	38	38	215	Stock Line
PRMX-3850	38	50	300	Stock Line
PRMX-4020	40	20	160	*
PRMX-4025	40	25	190	*
PRMX-4030	40	30	160	Stock Line
PRMX-4035	40	35	270	*
PRMX-4040	40	40	225	Stock Line
PRMX-4060	40	60	305	Stock Line
PRMX-4045	40	45	350	*
PRMX-4525	45	25	210	*
PRMX-4530	45	30	260	*
PRMX-4535	45	35	310	*
PRMX-4540	45	40	350	*
PRMX-4545	45	45	400	*
PRMX-4550	45	50	450	*
PRMX-4555	45	55	490	*
PRMX-5020	50	20	190	*
PRMX-5025	50	25	240	*
PRMX-5030	50	30	290	*
PRMX-5035	50	35	340	*
PRMX-5040	50	40	280	Stock Line
PRMX-5050	50	50	350	Stock Line
PRMX-5060	50	60	420	Stock Line
PRMX-5520	55	20	210	*
PRMX-5525	55	25	270	*
PRMX-5530	55	30	320	*
PRMX-5535	55	35	380	*
PRMX-5540	55	40	430	*
PRMX-5550	55	50	540	*
PRMX-6020	60	20	230	*
PRMX-6025	60	25	290	*
PRMX-6030	60	30	350	*
PRMX-6035	60	35	410	*
PRMX-6040	60	40	335	Stock Line
PRMX-6050	60	50	600	*
PRMX-6060	60	60	505	Stock Line
PRMX-6520	65	20	250	*
PRMX-6525	65	25	320	*

Product Code	D	L	Watts	Availability
PRMX-6530	65	30	380	*
PRMX-6535	65	35	450	*
PRMX-6540	65	40	520	*
PRMX-6550	65	50	650	*
PRMX-7020	70	20	270	*
PRMX-7025	70	25	340	*
PRMX-7030	70	30	410	*
PRMX-7035	70	35	505	Stock Line
PRMX-7040	70	40	560	*
PRMX-7050	70	50	700	*
PRMX-7060	70	60	840	*
PRMX-7520	75	20	290	*
PRMX-7525	75	25	370	*
PRMX-7530	75	30	440	*
PRMX-7535	75	35	520	*
PRMX-7540	75	40	560	*
PRMX-7550	75	50	750	*
PRMX-7560	75	60	900	*
PRMX-8020	80	20	310	*
PRMX-8025	80	25	390	*
PRMX-8030	80	30	470	*
PRMX-8035	80	35	560	*
PRMX-8040	80	40	640	*
PRMX-8050	80	50	800	*
PRMX-8060	80	60	960	*
PRMX-8520	85	20	330	*
PRMX-8525	85	25	420	*
PRMX-8530	85	30	500	*
PRMX-8535	85	35	590	*
PRMX-8540	85	40	680	*
PRMX-8550	85	50	850	*
PRMX-8560	85	60	1020	*
PRMX-9020	90	20	350	*
PRMX-9025	90	25	440	*
PRMX-9030	90	30	540	*
PRMX-9035	90	35	630	*
PRMX-9040	90	40	720	*
PRMX-9050	90	50	900	*
PRMX-9060	90	60	1080	*
PRMX-9520	95	20	370	*
PRMX-9525	95	25	470	*
PRMX-9530	95	30	570	*
PRMX-9535	95	35	660	*
PRMX-9540	95	40	760	*
PRMX-9550	95	50	950	*
PRMX-9560	95	60	1150	*
PRMX-10020	100	20	380	*
PRMX-10025	100	25	500	*
PRMX-10030	100	30	600	*
PRMX-10035	100	35	700	*
PRMX-10040	100	40	800	*
PRMX-10050	100	50	1000	*
PRMX-10060	100	60	1200	*



Reduce Your Power Consumption



UniVest®: For Plastic Processors

UniVest® insulation jackets provide a low-cost solution for reducing energy costs, and shortening start-up time between jobs by retaining heat inside barrels, extruders, dies and hoses. This will lower the ambient temperature in your facility, and lower the overhead cost for equipment operations and air conditioning.

Features

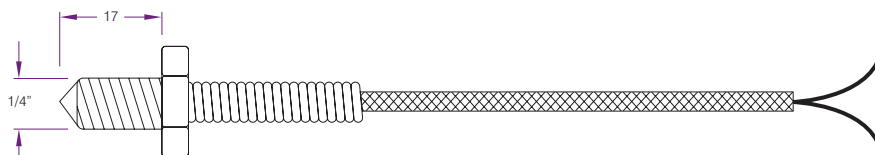
- High temperature strap and buckle fastening system
- PTFE coated exterior
- Withstand temperatures up to 1200°F
- High density ceramic fibre insulation

Benefits

- Improves equipment process
- Protects employees and equipment
- No equipment downtime
- Simple and quick installation
- Reduces energy consumption
- 100% Asbestos free

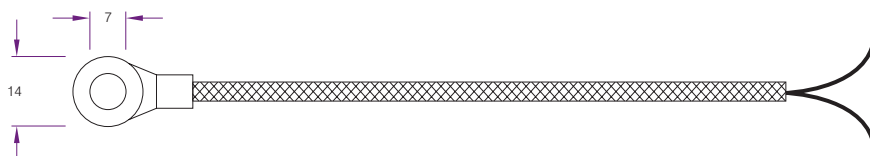


Thermocouple - Threaded Type



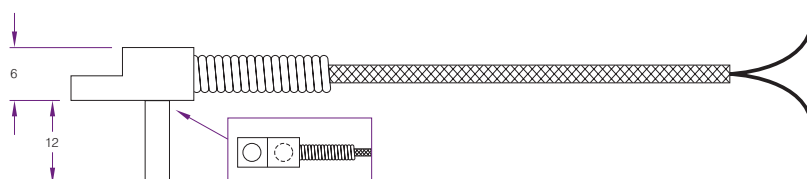
Product Code	Description
ETC0251	Threaded J Type

Thermocouple - Flat Washer Type



Product Code	Description
ETC0168	Flat Washer J Type

Thermocouple - Surface Pin Type



Product Code	Description
MASTE7003	Surface Pin J Type

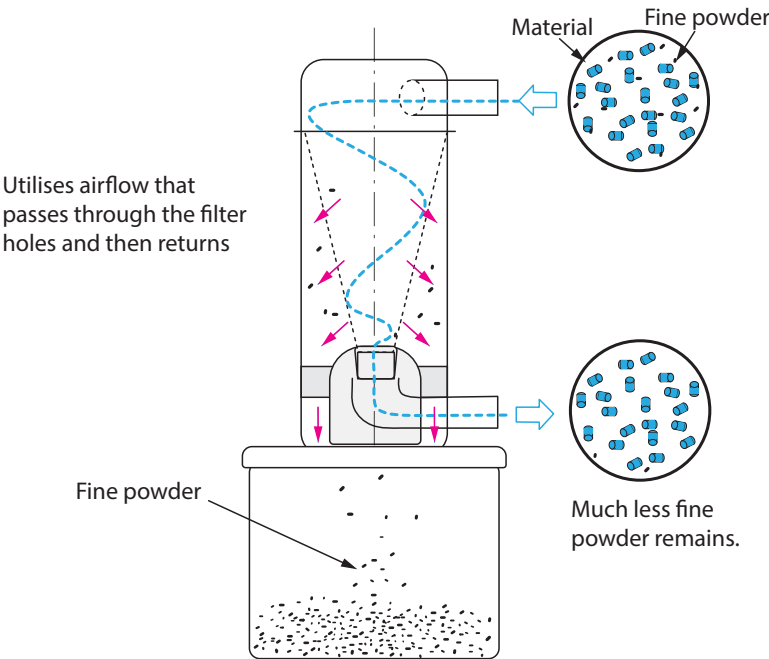


Designed to eliminate powder and fines contamination from plastic pellets, the ARV 38 De-Duster can be installed into any material line, to ensure more stable plasticising and eliminate product defects caused by incomplete melting.

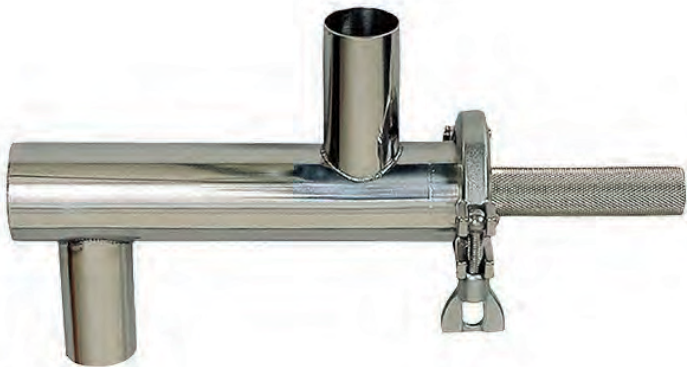
This new innovative ARV 38 De-Duster's unique filtering design allows contamination removal from the material itself. The material flow blends both material and vacuum pathways to achieve highly increased contamination and dust removal.

Can be retro-fitted into any type of loading system using a vacuum-transport principle. In addition, when the ARV 38 De-Duster is combined with a traditional vacuum-line dedusting system, material dust and contamination is virtually eliminated during the transport process.

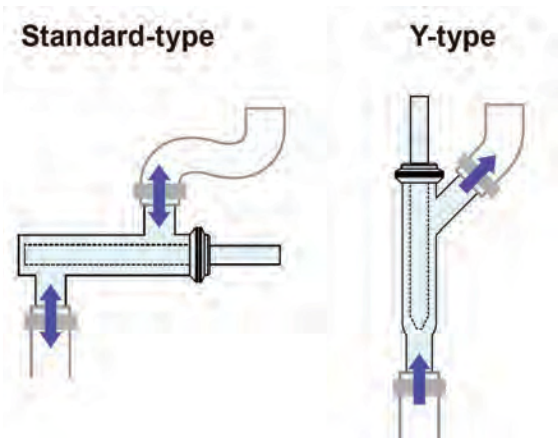
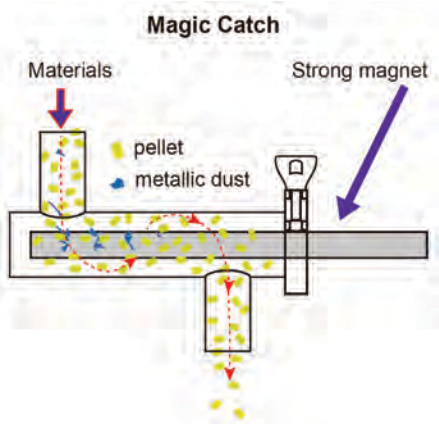
The ARV 38 De-Duster increases the removal of fine powders and dust using a cyclonic effect plus suction air flow through the filter holes.



Product Code	Details	Specifications
MATS-ARV-38	Port size (1-in, 1-out)	1.5" Dia. x 2
	Items included	1 x Mounting bracket, 2 x Hose clamps
	Dimensions L x W x H	229 x 280 x 635mm (9" x 11" x 25")



The Magic Catch in-line device uses a powerful magnet, installed in the resin line designed to catch any ferrous metal particles. It comes in several configuration shapes and tube diameter sizes to adapt to common material line sizes. This magnet can be integrated to eliminate foreign metallic material from entering the moulding cell. It connects simply into the material line and as the material passes, metal adheres to the Magic Catch™ internal rod, preventing it from contaminating the material being processed. Simply open the Magic Catch™ and wipe the debris off.



	Product Code	Type	Port Size
Magic Catch™ Polished Stainless Steel Construction	MATS-MC7000-38 STD	Standard	1.5"
	MATS-MC7000-50 STD	Standard	2"
	MATS-MC-227-25-38 STD	Standard	1.5"
	MATS-MC-227-25-50 STD	Standard	2"
	MATS-MC-227-25-38 Y	Y Type	1.5"
	MATS-MC-227-25-50 Y	Y Type	2"



Reliable And Accurate Heating And Cooling Circuits

- Stainless Steel heaters / tanks
- Insulated water tanks
- Safety thermostat
- 24 month warranty
- Speck pumps
- SMS brass solenoid valves (cooling & filling)

There are two families of TCU's available:

Water TCU's from 25°C to 180°C with heating powers from 3 to 72kw.

Oil TCU's up to 300°C with heating powers from 6 to 72 kW.

Working with water offers advantages especially at high temperatures, its performance in heat transfer much better than oil.

Water as a means of temperature control also offers many advantages from an ecological point of view.

Working with oil up to 300°C is necessary when the working temperature must be above 180°C that we offer with water equipment.

Unlike water, oil has much more thermal stability.

*** Other TCU Model Water and Oil Units available. For more information, please contact info@hales.com.au**

Maximum Temp.		PID control	Process Connections Input/Output			Cooling Connections Input/Output			Voltage (V/Ph/Hz)	
90°		Yes	3/4"			1/2"			400/3/50/PE	
Product Code	Heating Power (Kw)	Cooling Power (Kw)	Tank Capacity (Lt)	Pump Max. Flow Lt/min	Pump Max Pressure (Bar)	Pump Power (Kw)	Dimensions	Weight (Kg)	Solid State Relay Options	Reverse / Vacuum Function
MAR-Smart Basic	3 / 6	40	8	60	3.8	0.5	240 x 450 x 380 h	35	with or without SSR	No
MAR-Smart W	6 / 9	40 / 60 / 80	12	60	3.8 / 5.8	0.5 / 1	285 x 570 x 500 h	35	with or without SSR	Yes
MAR-Smart 2 W	9 / 12 / 18	40 / 60 / 80	20	60 / 70	3.8 / 5.8	0.5 / 1	325 x 610 x 700h	40	SSR included as standard	Yes



Used for clearing blocked or badly corroded heating and cooling circuits on Injection Moulding Machines and Moulds. Even when not blocked a relatively thin layer of scale or corrosion can act as an insulator and have a huge impact on the efficiency of your circuit.

Simply fill up the pump with the de-scaling fluid, connect the pump to the inlet and outlet of the circuit and turn on the pump. Regular reversal of flow direction, either manual or automatic, speeds up operation and assists in dislodging any solid matter present in pipework and cooling circuits.

By using the pump together with the recommended range of de-scaling fluids it is possible to remove both rust and lime scale deposits.

DE-SCALING KIT

Product Code	Capacity (kg)	Motor	Reverser	Tank
DP15ASK	40 l/min.	0,17 hp	Automatic	15 l.
DP30ASK	90 l/min.	0,45 hp	Automatic	24 l.

DE-SCALING UNIT PUMP UNIT ONLY

Product Code	Capacity (kg)	Fittings	Motor	Reverser	Tank
DP15A	40 l/min.	1/2"	0,17 hp	Automatic	15 l.
DP15M	48 l/min.	1/2"	0,20 hp	Manual	15 l.
DP30A	90 l/min.	1/2"	0,45 hp	Automatic	24 l.
DP30M	90 l/min.	1/2"	0,45 hp	Manual	24 l.



Remover Liquid - Concentrated de-scaling liquid with powerful reaction for systems and heat exchangers.

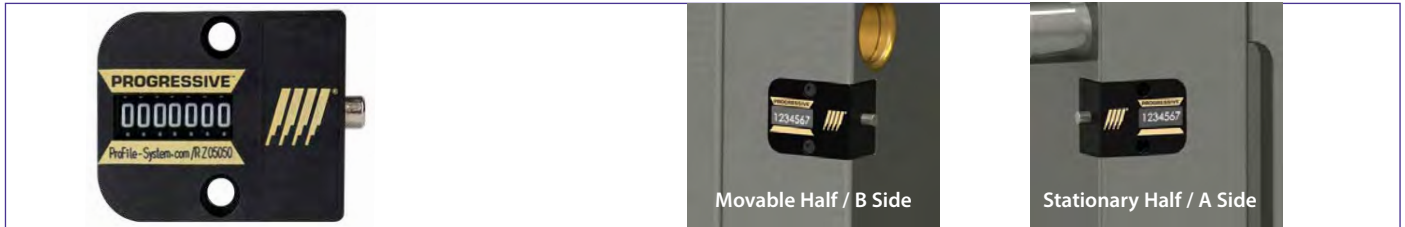
Remover Plus Liquid - Concentrated de-scaling liquid (non-fuming), degreasing action, for systems & heat exchangers.

Remover Plus Powder - Concentrated de-scaling powder (non-corrosive, non-fuming) for systems and heat exchangers.

Neutraliser - Neutralising powder to remove residual acidity after de-scaling systems and heat exchangers. Also suitable for neutralising de-scaling chemicals after use, prior to draining them.

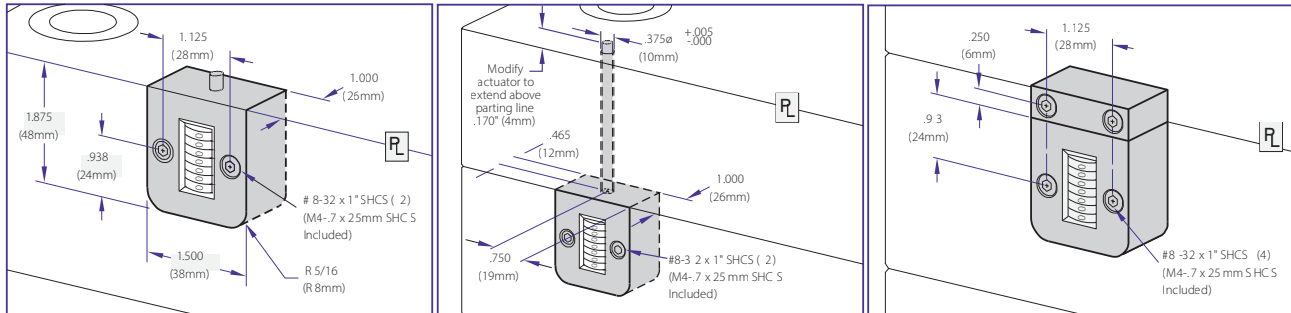
DE-SCALING FLUIDS

Product Code	Description	Weight	Copper	Steel	S/Steel	Alum.	Brass	Tin	Light Alloys	Gal. Iron
RL10	Remover Liquid	10kg	*	*			(*)			
RL10P	Remover Plus Liquid	10kg	*	*			(*)			
RP10	Remover Plus Powder	10kg			*	*	*	*	*	
NP10	Neutraliser	10kg	*	*	*	*	*	*	*	*



Movable Half / B Side

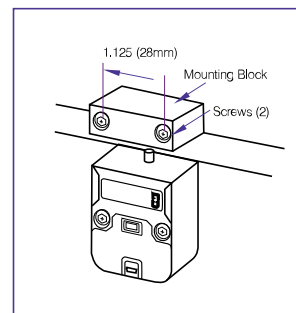
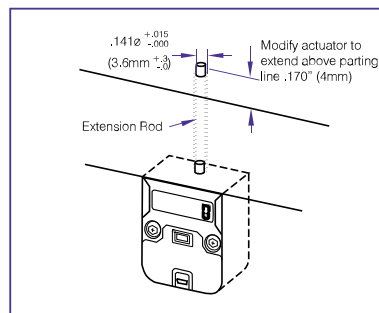
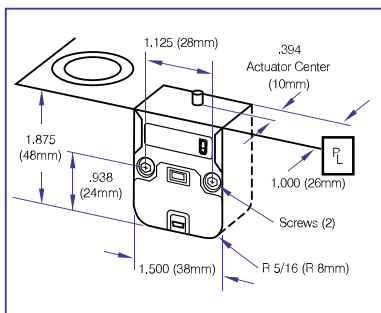
Stationary Half / A Side



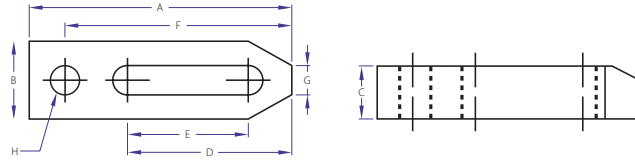
The CounterView positively monitors mould activity, validates process monitoring data, and assists mould maintenance procedures

- Maximum operating temperatures:– 250 °F (120 °C) Standard CounterView
- Counter: Non-resettable mechanical, 7-digit
- Available for installation on the movable or stationary halves and with extensions
- Heat protection insulators available on request
- Cover Plates for protection are sold separately.

Product Code	Description
CVPL-B	Standard: Parting Line
CVIN-B	Standard: Internal Extension
CVPL-A	Standard: Parting Line
CVIN-A	Standard: Internal Extension
CVE-EXT	External Mounting Block including #8-32 x 1" (2) and M4 x 25mm screws (2)



Product Code	Description
CVE	CvE Monitor v2 mould Maker/moulder version including #8-32 x 1" SHCS (2) and M4 x 25mm SHCS (2)
CVE-INT	Internal Extension Rod (8"/200mm) including a hex key for CvE Monitor set screw removal.
CVE-EXT	External Mounting Block including #8-32 x 1" SHCS (2) and M4 x 25mm SHCS (2)



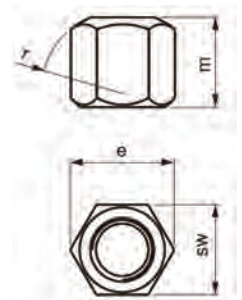
Product Code	Model	A	B	C	D	E	F	G	H
MC12	M12 x 100mm	100	32	19	71	43	88	13	M12
MC16	M16 x 150mm	150	37	25	100	60	130	17	M16
MC20	M20 x 200mm	200	50	32	114	82	185	21	M20
MC25	M25 x 250mm	250	70	45	157	100	224	27	M24

Hexagon Nut



- Hardened
- Black Coating

Product Code	SW	e	m	r	Weight
MC-HN-M12	19 mm	21.9 mm	18 mm	17 mm	25 g
MC-HN-M16	24 mm	27.7 mm	24 mm	22 mm	55 g
MC-HN-M20	30 mm	34.6 mm	30 mm	27 mm	110 g
MC-HN-M24	36 mm	41.5 mm	36 mm	32 mm	190 g

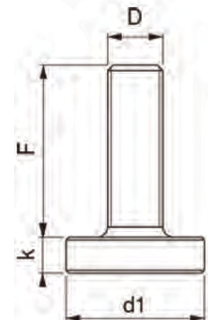
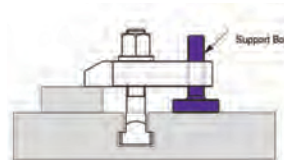


Clamp Support Bolt



- Black Coating

Product Code	d1	k	Weight
MC-SB-M12x50	36 mm	10 mm	110 g
MC-SB-M16x62	45 mm	13 mm	240 g
MC-SB-M20x62	50 mm	13 mm	320 g
MC-SB-M24x116	50 mm	14 mm	555 g

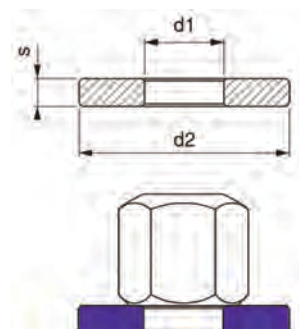


Thick Washer



- Hardened
- Black Coating

Product Code	d1	d2	s	Weight
MC-TW-M12	13 mm	35 mm	5 mm	30 g
MC-TW-M16	17 mm	45 mm	6 mm	60 g
MC-TW-M20	21 mm	50 mm	6 mm	70 g
MC-TW-M24	25 mm	60 mm	8 mm	140 g





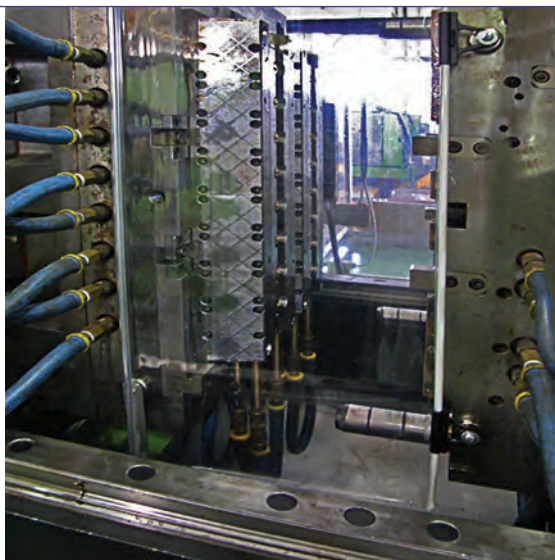
Product Code	Attachment Bolt Size	Overall Length
BC12	12mm	100mm
BC16	16mm	125mm
BC20	20mm	160mm
BC24	24mm	200mm

Hopper Magnets



Product Code	Length	Width	Height	Type
HM-5R	120	112	90	Round Type - 5 Bars
HM-5S	120	112	90	Square Type - 5 Bars
HM-7R	180	175	75	Round Type - 7 Bars
HM-7S	180	175	75	Square Type - 7 Bars
HM-9R	230	218	75	Round Type - 9 Bars
HM-9S	230	218	75	Square Type - 9 Bars

Mould Curtain - Scatterguard®



Scatterguard® allows easy access to the mould with the ultra low profile design meaning that the mould screens can be installed even when there are lots of water connectors on the side of the mould.

- Ultra Low Profile Design.
- Crystal Clear Mould Screen.

Product Code	Mould Height	Max. Width	Package
SG-1	20 cm	55 cm	(set of 2 pieces)
SG-2	30 cm	55 cm	(set of 2 pieces)
SG-3	40 cm	55 cm	(set of 2 pieces)
SG-4	50 cm	55 cm	(set of 2 pieces)
SG-5	60 cm	55 cm	(set of 2 pieces)



- Pressure test unit - easy leakage test of mould circuits
- Supplied with connecting hose and water tank

Product Code	Pressure
MP60	0-60 bar

Bernzomatic -Torch Kit & Accessories



Bernzomatic High Heat Torch Kit

- Trigger start ignition
- 30% hotter than propane
- Powerful swirl flame
- Continuous flame lock

MAP-PRO 400g Disposable Gas Cylinder

- Faster heat transfer than propane gas
- Flame temperature in air 1982.2 °C

Butane Bottle

- 5.5 oz. cylinder
- Flame temperature in air of 1760°C

Product Code	Description
BERN TS4000TK	High Heat Torch Kit
BERN 1811120	Map Pro Gas Cylinder
BERN BF55	Fuel Cylinder

Cleaner Degreaser Spray - Clean Spray - Food Grade



Foodmax Clean Spray is a food grade cleaner degreaser. This non-toxic formulation has been formulated to effectively clean grease and oil residue, formulated from a citrus oil derivative which is non-toxic, non-caustic, biodegradable and can be used safely with minimal protective equipment.

Product Code	Description	Pack Size
FM-CLEANSpray -040	Foodmax Clean Spray	400g Aerosol

Release S Spray - Food Grade



Foodmax Release S Spray is a silicone based fluid, anti-adherent and lubricating incorporating high temperature resistance. NSF approved for the use in food processing equipment where incidental contact with food may occur. Excellent as lubricating product for packaging transport lines and for low load applications. Also suitable as anti-adherent for any type of equipment, de-moulding of all type of plastics and rubbers and surface polisher.

Product Code	Description	Pack Size
FM-RELEASE S SPRAY -040	Foodmax Release S Spray	400g Aerosol



A proven release agent to prevent sticking in mould cavities
Australian Made

NEW Packaging; same great product!



Product Code	Size
SILICONE MOULD RELEASE	300g Aerosol

Paintable Mould Release



A premium quality release agent which enables plastic parts to be printed, painted, hot stamped, vacuum plated and metalised
Australian Made

NEW Packaging; same great product!



Product Code	Size
PAINTABLE MOULD RELEASE	300g Aerosol

Tool & Die Parts Cleaner



A heavy duty formulation designed to clean injection mould, tools and dies after production runs and prior to commencement of new jobs.
Australian Made

NEW Packaging; same great product!



Product Code	Size
DIE CLEANER	400g Aerosol

Tool & Die Protector



A heavy duty formulation designed to protect tools, injection moulds and dies from oxidization and rusting during storage in between production runs. Penetrates tools and mould removes moisture from cavities and mould. Leaves a protective film of lubrication oils and a rust preventative coating.
Australian Made

NEW Packaging; same great product!



Product Code	Size
DIE PROTECTOR	400g Aerosol



Anti-corrosion agents provide dismantled dies, moulds and parts with long-term protection against corrosion. This ensures that your mould is always ready for use, maintaining value and efficiency.
Sprays on green in colour and moulds off easily.
Conforms to NSF guidelines.

Product Code	Size
MPW501FG	500 ml Aerosol

Green Mould Protect



Anti-corrosion agents provide dismantled dies, moulds and parts with long-term protection against corrosion. This ensures that your mould is always ready for use, maintaining value and efficiency

Product Code	Size
MPG 501	500 ml Aerosol

Heavy Duty Polymer Remover



Eliminates tough plastic residues from moulds and dies, including those stubborn bits left by cracking. Designed with efficiency in mind, this cleaner not only saves you time in production but also maintains the dimensional accuracy and pristine surface of your plastic parts and mouldings.
Conforms to NSF guidelines.

Product Code	Size
MPR 502FG	500 ml Aerosol

Mould Protect - Acid Neutraliser



Mould Protect - Long Term with Acid Neutraliser is specifically designed for PVC moulding applications. This advanced protective solution provides long-term protection for your moulds by neutralising acids and preventing corrosion, ensuring your equipment remains in optimal condition.

Product Code	Size
MPP501	500 ml Aerosol



Non-soiling lubricants that keep moving parts running smoothly and prevent damage due to breakage and seizing.

Product Code	Size
MLF500FG	500g tub
MLF080FG	80g tube
MLF501FG	500 ml spray

Mould Polish



Mould Polish

This superior quality mould polish is perfect for cleaning and polishing steel moulds. It safely and easily removes oxidation, corrosion, stains and rust. It produces a brilliant reflective lustre and leaves an invisible protective coating to ensure a long lasting shine.

Product Code	Size
MCP080	80g Tube

Copper Anti-Seize



Mouldpro Copper Anti-Seize ensures rapid and easy assembly of threaded parts. It allows correct torque to be applied by eliminating thread interference.

Product Code	Size
MCS 500	500g tub
MCS 80	80g tube

Spray Can Holder



Stainless Steel aerosol holder, available to suit 2, 3 or 4 cans. Specifically designed and manufactured for mounting onto machines. Allows convenient positioning of fundamental aerosols.

Product Code	Size
MCH-02	Holds 2 Cans
MCH-03	Holds 3 Cans
MCH-04	Holds 4 Cans



Food Grade Strong Wipes With Powerful Cleaner
NSF A1 Approved.

Foodmax Clean Wipes are strong two-sided cleaning wipes containing a powerful cleaner in a resealable container.

They are suitable to clean equipment, machine parts, work areas, tools, hands, and many other surfaces. Effectively removes heavy pollutants like oil, greases, tar, PU foam, resin, soot, grass stains, paint, ink, marker, toner and graffiti.

Product Code	Size
FM-CLEANWIPES	Tub of 100 wipes

Purge - Food Grade



Food Safe Purging Cream

Hales Purge is specific for the cleaning of screws, cylinders, nozzles, hot runners, extrusion dies, moulds and any metal surface. Removes charred residue, black spots, coloured pigments and all left over material deposits, for all thermoplastic and thermosetting.

Working temperature between 70°C and 420°C,

Product Code	Size
PURGE	Sachet

Purging Emulsion - Coratex



Purging Emulsion for Plastic Processing Machines

- Purges: Barrels and screws, nozzles and hot runner tooling of extrusion and injection moulding machines
- Enables fast change of raw material and higher production efficiency
- Eliminates extra stubborn contamination, oxidation traces and coking residues
- CORATEX HT is VOC and ammonia-free, has a pleasant orange scent and is physiologically harmless when used according to directions. Perfectly suited for hand polishing individual machine parts

Product Code	Size
CORATEX-STD	800ml
CORATEX-HT	800ml

Oil Absorbant Clay & Sheets



Clay

All purpose spill absorber, made from 100% absorbant granules which are effective at absorbing spills and liquids. Environmentally safe and easy to use 20kg bags.

Sheets

Extremely good absorption ability and capacity for all types of organic fluids, i.e.: motor oils, hydraulic oils, gear oils, organic solvents, diesel oil, petrol, etc.

Product Code	Pack Size
ABSORBCLAY	20 Kg Bag
ABSORBSHEET 100	100 Sheets (40 x 50cm)



Safekote 60

A high-temperature, anti-seizing compound with high thermal conductivity for cartridge and band heaters and nozzle threads.

Product Code	Size
SAFEKOTE 60	340g tub

Nano Plas Mould Coating



Nano Plas Mould Coating

Releases plastic parts for up to 300,000 cycles, part design dependant. Reduces cycle times, semi permanent

Product Code
NANO-FG-10ML-KIT

Zap-Ox Cleaner



Zap-Ox Stain Remover

Removes all rust, oxidation, build-up, stains, weld discolouration and more.

Product Code	Size
NANO-ZO-16	475ml Bottle

Sprue Reamers



2 Sizes Available

Sprue Reamers are suitable for both machine and hand use and are made from High Speed Steel. 6 flute left hand slow spiral design with a 1/2" diameter parallel shank.

Product Code	Code Number	Taper Degrees	Flute			Overall Length
			Small Dia.	Large Dia.	Length	
CRS1202	1/2	2	.120"	.300"	5"	7"
CRS1203	1/3	3	.120"	.390"	5"	7"



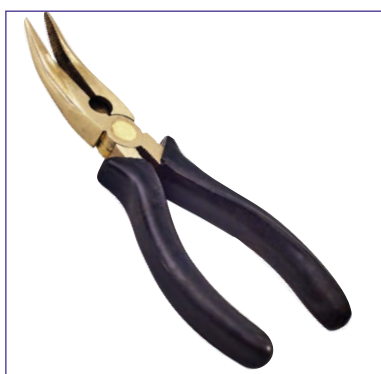
Product Code	Size	Diameter	Weight	Length	Faces
TH208	A	25 MM	355 G	230MM	COPPER RAWHIDE
TH210	1	32 MM	710 G	270MM	COPPER RAWHIDE
TH212	2	38 MM	1070 G	305MM	COPPER RAWHIDE
TH214	3	44 MM	1600 G	305MM	COPPER RAWHIDE
TH216	4	50 MM	2380 G	355MM	COPPER RAWHIDE
TH312	2	38 MM	1070 G	305MM	COPPER COPPER
TH314	3	44 MM	1600 G	305MM	COPPER COPPER
TH316	4	50 MM	2380 G	355MM	COPPER COPPER

Bevelled Edge Scraper



Product Code	Blade Width	Blade Length	Total Length
BSC125L	1"/25mm	7"/177mm	10 3/4"/273mm
BSC125	1 1/4"/32mm	4"/100mm	8"/200mm
BSC200	2"/50mm	4"/100mm	8"/200mm

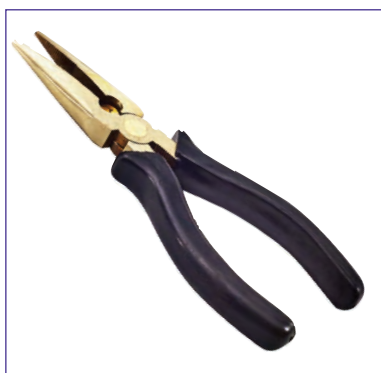
Bronze Angled Pliers



High quality bronze pliers, reduce risk of damaging the mould.
Angled for hard to reach places.

Product Code	Size
BC60	6"/150mm
BC90	9"/230mm

Bronze Long Nose Pliers



High quality bronze pliers, reduce risk of damaging the mould.

Product Code	Size
BL60	6"/150mm
BL90	9"/230mm

125mm Sprue Snips



Total Length: 130mm
Blade Length: 19mm
Usable Blade Opening at Tip: 13.5mm
Usable Blade Opening at Base: 5.5mm

Product Code	Description
MCTS125	Model: 125mm

150mm Sprue Snips



Total Length: 155mm
Blade Length: 21mm
Usable Blade Opening at Tip: 16mm
Usable Blade Opening at Base: 6mm

Product Code	Description
MCTS150	Model: 150mm

180mm Sprue Snips



Total Length: 185mm
Blade Length: 25mm
Spring Type Coil

Product Code	Description
MCTS180	Model: 180mm

Flat/Angled Back Sprue Snips



Product Code	Description
MC160S	Flat Back Japanese Quality Snips
MC170S	Angled Back Japanese Quality Snips



A simple but effective tool for removing over packed plastic material from sprues or hot runner systems. The knock-out bar combines a tough steel rod with threaded brass replaceable tips that prevent damage to the mould surface. The steel rod never wears out and the end will not 'mushroom' like a solid brass rod, the threaded brass tips are quickly replaced ensuring that the rod never gets too short and minimises the risk of burning.

Product Code	Description
704-31	Knock Out Bar set (tip + handle)

Pry Bar- Radius Head



Premium bronze alloy pry bars ideal for splitting mould plates without the risk of damage or scratches to the surface of the mould.

- Aluminium Bronze Alloy
- Non-Sparking

Product Code	Hex	Length (mm)	Weight
MPB-500	5/8"	18" (460)	800 g

Leather Gloves



Leather Gauntlet Gloves

Ideal for handling hot machine parts

Product Code	Size
WG06/R8	One Size

Work Finisher Ceramic & Throwaway Knives



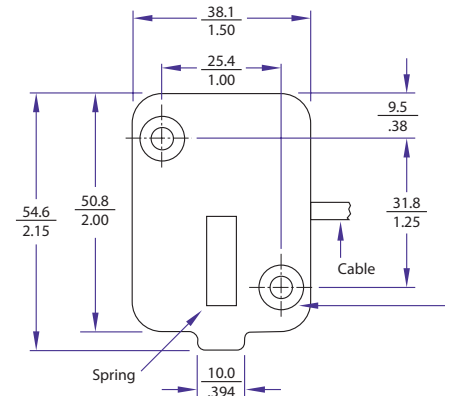
Small and large Work Finishers offer deburring of hard plastics, without the possibility of cutting your hand.

Product Code	Description
WF620	Small Work Finisher Knife
WF1540	Large Work Finisher Knife
TSK	145mm Long Disposable Fixed Knife Blade

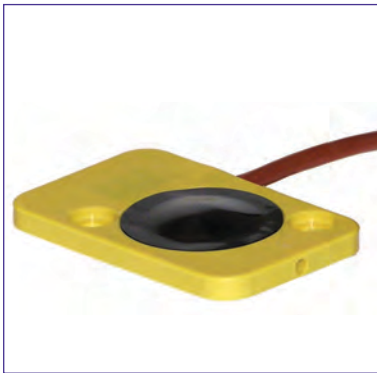
**Smartflow Thinswitch® Limit Switch**

Designed to verify ejector plate return. The Thinswitch helps prevent accidental mould close in injection moulding applications by providing a position switch that is tied to the injection moulding machine control. Two switches can be used in series for larger moulds to ensure the ejector plate return, preventing costly mould damage.

Product Code	Description	Max Temp.
T-222	Thinswitch® Limit Switch	175°F / 79.4°C

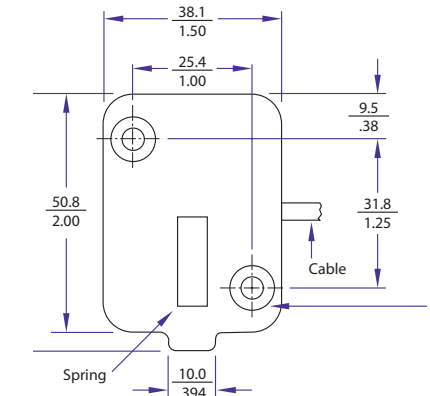


Limit Switch - Thinswitch® Liquid Resistant

**Thinswitch® Liquid Resistant Limit Switch**

- Designed to verify ejector plate return in areas where occasional water or oil spray is present
- Helps prevent accidental mould close by providing a position switch that is tied to the machine control
- Uses the same mounting hole locations as the original Thinswitch

Product Code	Description	Max Temp.
HT-291-LR	Thinswitch® Liquid Resistant	250°F / 121°C

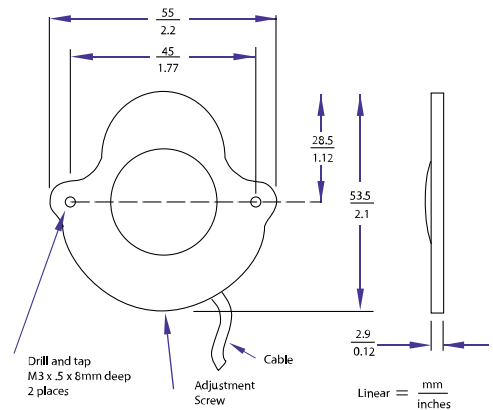


Limit Switch - Thinswitch® Global

**The Global Thinswitch® Limit Switch**

- Liquid resistant · Over 14 million cycle life
- Only 3 or 4mm Thick · Temperature max. 79.4°C @ 70 m A load
- 2 minute fitting (No milling necessary)

Product Code	Description	Max Temp.
TW-222-LR	Global Thinswitch	175°F / 79.4°C

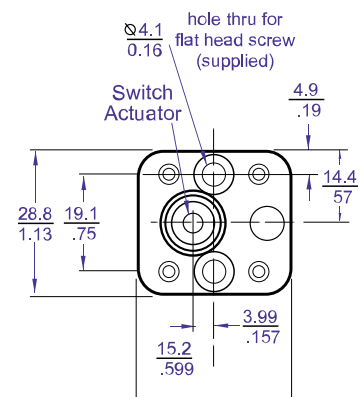


Limit Switch - Smartlock® Core Slide Retainer

**Smartlock® Core Slide Retainer & Limit Switch**

- Over 10 million cycle life
- Temperature max. 79.4°C @ 2 A load
- 17-27 pounds holding force
- Superior flush mounted switch
- Optional High Temperature model max. 121.1°C @ 3.5 A load

Product Code	Description	Max Temp.
SL-222	Smart Lock	175°F / 79.4°C





Noga Burr Rapid 3 & Rapid 5

Will do almost all of your deburring jobs, including coarse to extra fine deburring operations..

3 includes: NG-1 handle, S10, S20 and S35 blades.

5 includes: NG-1 handle, S10, S20, S35, S101 and S202 blades.

Product Code	Description
NNG1003	Handle, S10, S20 and S35 blades
NNG1005	Handle, S20, S35, S101 and S202 blades

Deburring Tools - Liza Burr



Double end blade holder to utilize both N and S blades.

Telescopes from 20-110 mm with N Blades.

20-94 mm with S Blades.

Includes: Uni-handle, SN-holder, N1 & N2 blades.

Product Code	Description
NLB1000	UN1000 Handle, SN Holder, N1& N2 blades with extension arm.

Deburring Tools - Rapid Burr



12mm hexagonal painted handle and S10 Blade.

Steel housing for long life of handle.

Blade is replaceable.

Product Code	Blade Compatibility
NRB1005	3.2mm blades

Deburring Tools - Teddy Burr



Designed for hard to reach locations.

Holds 2.6mm blades.

8mm painted hexagonal aluminium handle and N1 blade.

Blade is replaceable.

Product Code	Blade Compatibility
NTB1000	2.6mm blades

Deburring Tools - Edge-Off



Disposable tool.

A handy pocket clip is a standard feature of this tool.

Includes: S10 blade mounted in an 8mm painted hexagonal aluminium handle.

Product Code	Blade Compatibility
NEO1015	S10 blade

The standard tool for Counter-sinking, useful for chamfering deep holes.

Product Code	Description
NNG3100	Noga Counter-sink deburring tool



Deburring Tools - Scraper

Heavy Duty double end scraper for longer tool life, can be locked in required position.

Product Code	Blade Compatibility
NSC1000	Double ended T120 triangular scraper



Deburring Tools - Blades

Noga S10 Swivel Blade

Best for steel, aluminium and plastic.

Product Code	Angle	Pack Quantity
NBS1010	40°	10 pieces in pack



Noga S10 Heavy Duty Swivel Blade

Best for brass and cast iron.

Product Code	Angle	Pack Quantity
NBS2010	60°	10 pieces in pack



Noga S101 Blade

Best for fine edges on all materials. For right hand users.

Product Code	Angle	Pack Quantity
NBK1010	40°	10 pieces in pack



Noga S150 Blade

Best for holes as small as 1.5mm. For right hand users.

Product Code	Angle	Pack Quantity
NBK3010	45°	10 pieces in pack

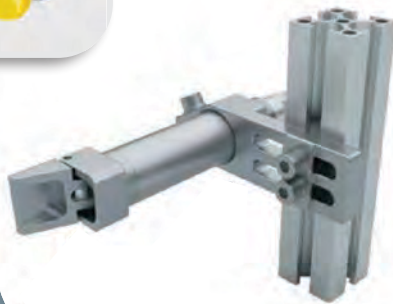
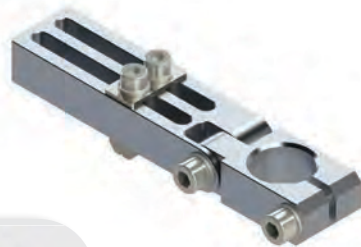


Noga N1 Swivel Blade

Best for steel, aluminium and plastic.

Product Code	Angle	Pack Quantity
NBN1010	40°	10 pieces in pack





QUICK CHANGE

■ Base Plate	196
■ Quick Changer Robot Side	196

PROFILES, CONNECTORS & NUTS

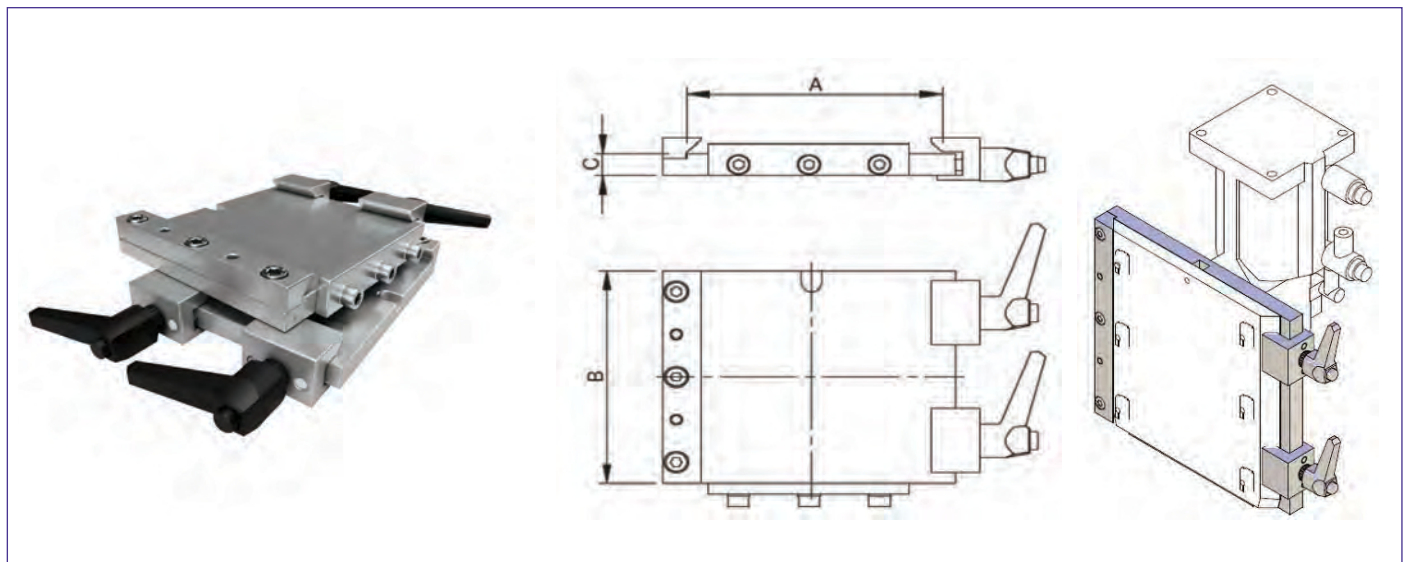
■ Aluminium Profile	197
■ Channel Nut For Profiles	198
■ Profile Cross Joint Connector	198
■ Angle Clamp Heavy Duty	199
■ Cross Connector Round	199
■ Short Angle Clamp	200
■ Medium Angle Clamp	200
■ Long Angle Clamps	201

GRIPPERS

■ Gripper Elbow Arms	203
■ Sprue Grippers Standard Series	204
■ C-Slot Sensor	204
■ Last Minute Sensor	204
■ Sprue Grippers	205
■ Jaw Insert Pad - Viton	205
■ Sensors	205
■ Finger Grippers	207
■ Parallel Gripper	208
■ T-Slot Sensor	208
■ Insert Pad Viton	208
■ Jaws For Parallel Grippers	209
■ Mounting Bracket for Grippers	209

VACUUM CUPS & MOUNTS

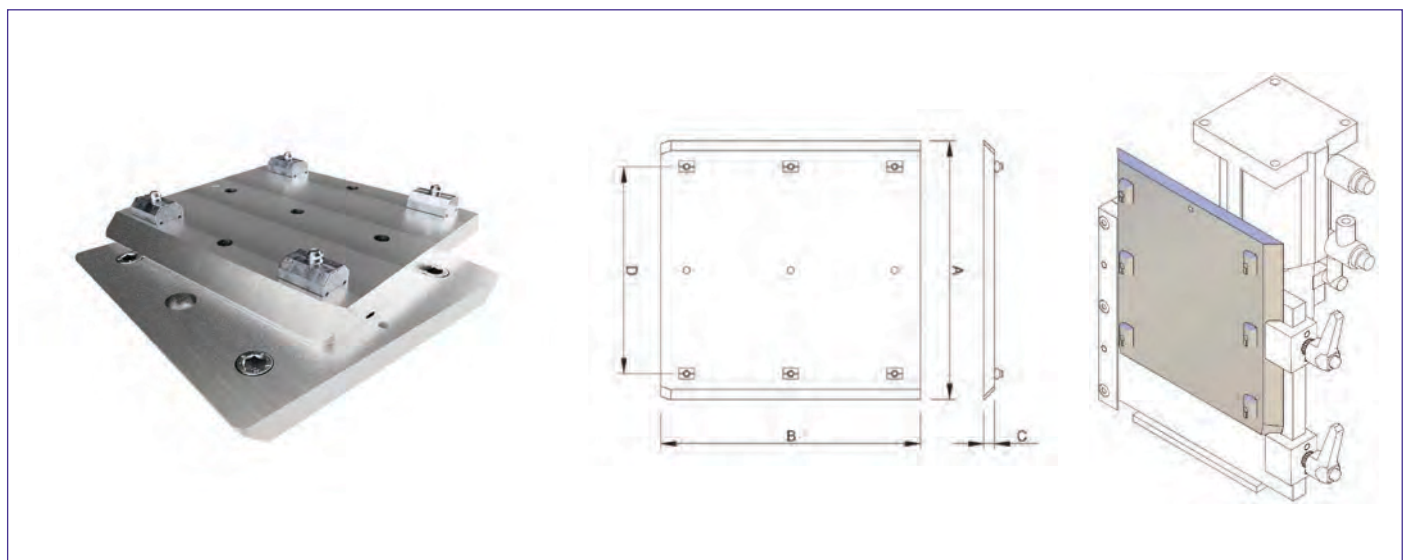
■ Vacuum Cups Flat With Cleats - F Series	210
■ Vacuum Cups 1.5 Bellow - B Series	211
■ Vacuum Cups 1.5 Bellow CL Series	212
■ Vacuum Cups 2.5 Bellow CL Series	213
■ Vacuum Cups 1.5 Bellow B Series Multiflex	214
■ Vacuum Cups 2.5 Bellow B Series Multiflex	215
■ Elbow Arm For Vacuum Cups	216
■ Vacuum Cup Mounting Bracket	216
■ Vacuum Cup Mounting Bracket - Long	217
■ Level Compensator (Non-rotative)	218
■ Spring Loaded Arm (Rotative)	218



Manual interface between robot and EOAT.
Works with all profile systems.

Product Code	A	B	C	Max Load	Reference	Weight
QC-RSW-60-00	60	60	10	5kg	QC-SSW-60	140g
QC-RSW-100-00	100	100	10	10kg	QC-SSW-100	495g
QC-RSW-160-00	160	160	10	20kg	QC-SSW-160	1136 g
QC-RSW-250-00	250	250	10	40kg	QC-SSW-250	3072g

Quick Change Base Plate

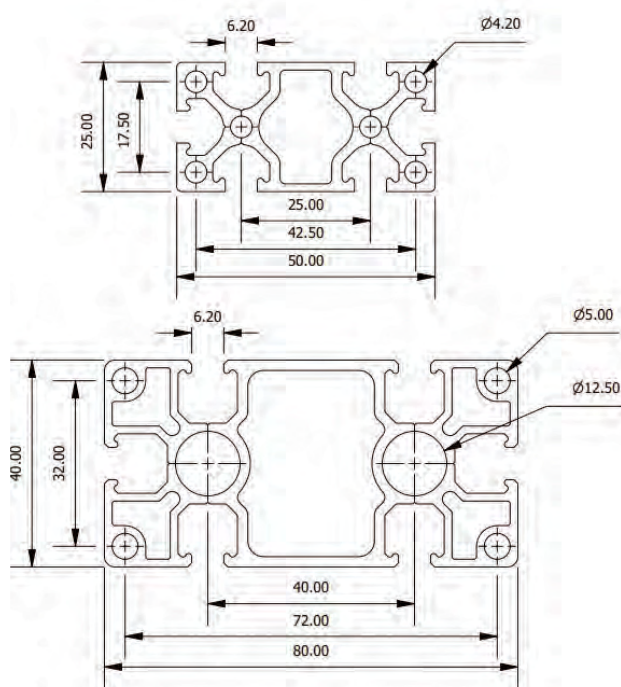
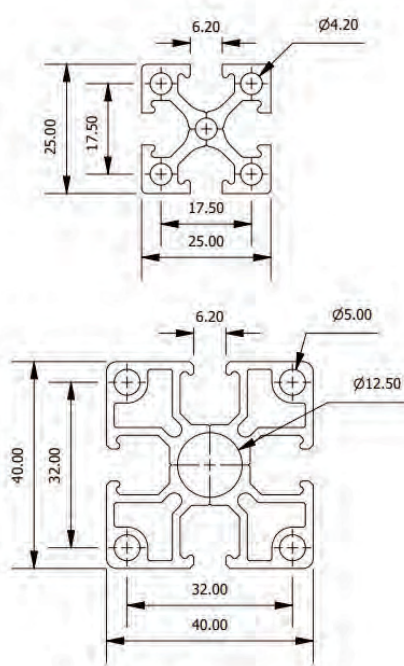
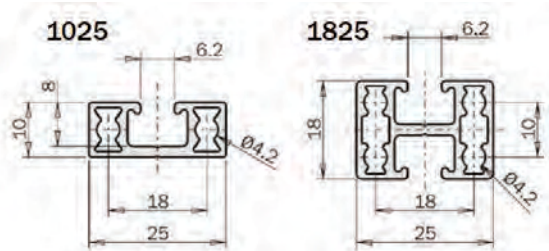
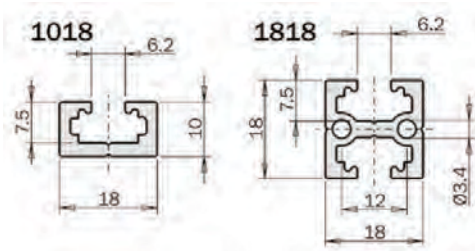


Material: Aluminium.
Surface: Silver anodized.

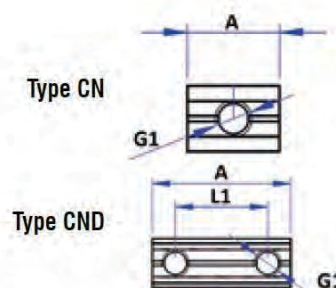
Product Code	A	B	C	D	Reference	Weight
QC-SSW-60	60	60	8	35	QC-RSW-60-00	93g
QC-SSW-100	100	100	8	70	QC-RSW-100-00	242g
QC-SSW-160	160	160	10	120	QC-RSW-160-00	695g
QC-SSW-250	250	250	10	200	QC-RSW-250-00	1641g



Material: Aluminium.
Surface: Silver anodized.



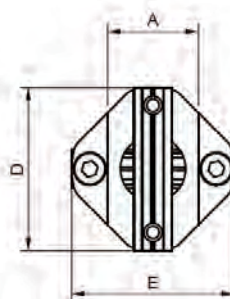
Product Code	Length	Reference	Weight
APL.1018.1000	1m	MPP-10-18	250g
APL.1818.1000	1m	MPP-18-18	400g
APX.1025.1000	1m	MPP-10-25	280g
APX.1825.1000	1m	MPP-18-25	400g
APX.2525.1000	1m	MPP-25-25	683g
APX.2525.2000	2m	MPP-25-25	1365g
APX.2550.1000	1m	MPP-25-50	1155g
APX.2550.2000	2m	MPP-25-50	2311g
APJ.4040.1000	1m	MPP-40-40	1407g
APJ.4040.2000	2m	MPP-40-40	2814g
APJ.4080.1000	1m	MPP-40-80	2302g
APJ.4080.2000	2m	MPP-40-80	4603g



Suitable for L, X and J line of profiles.

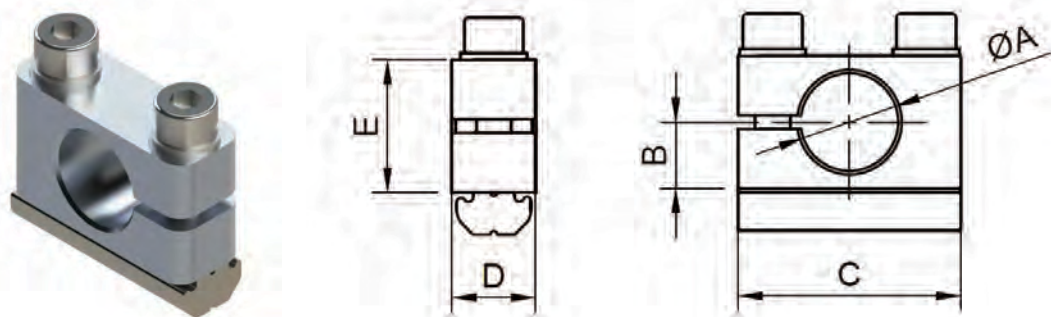
Product Code	G1	A	L1	Weight
CN-M3	M3	15		6g
CN-M4	M4	15		6g
CN-M4-16	M4	24	16	9g
CN-M5	M5	15		5g
CN-M5-20	M5	30	20	11g
CN-M6	M6	15		5g
CN-M6-20	M6	30	20	11g

Profile Cross Joint Connector



Exact 90° connection of two profiles.
Highly rigid, connection.
Allows adjustment of both profiles.

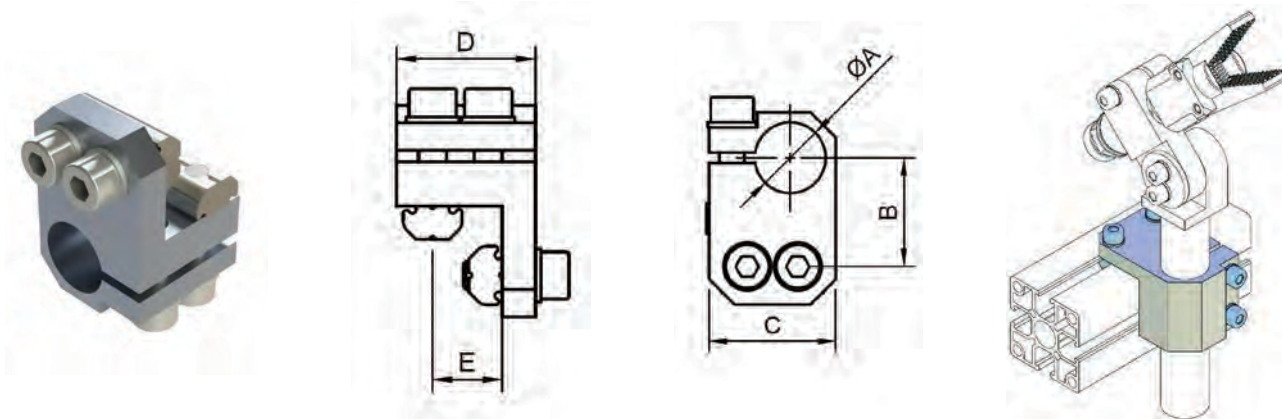
Product Code	A	B	C	D	E	Reference	Weight
CC18-18-L	18	18	38	38	3	L	40g
CC25-18-X	25	18	45	45	4	X	60g
CC25-25-X	25	25	45	45	4	X	67g
CC50-25-X	50	25	45	70	4	X	76g
CC50-50-X	50	50	70	70	4	X	192g
CC40-25-J	40	25	45	60	4	X/J	77g
CC40-40-J	40	40	65	65	4	J	81g
CC80-40-J	80	40	100	60	4	J	156g
CC80-80-J	80	80	100	100	4	J	268g



Connects tubular components to profiles at 90°.
Adjustment of components without loss of clamp position.

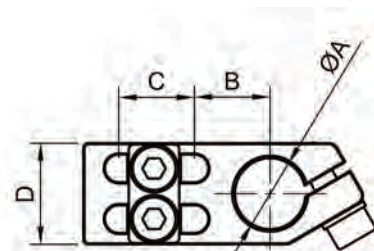
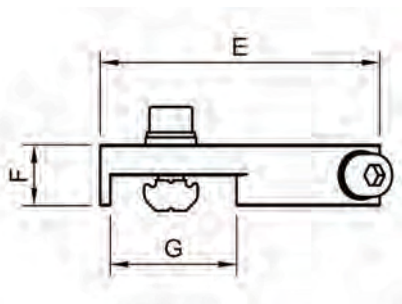
Product Code	A	B	C	D	E	Weight
CCR.10.X	10	7	25	10	14	22g
CCR.14.X	14	9,5	32	12	19	36g
CCR.20.X	20	14	40	15	28	58g
CCR.20.J	20	14	40	20	28	75g
CCR.30.J	30	18	50	20	36	97g

Angle Clamp Heavy Duty



Heavy duty clamp.
Minimises deflection due to wrap around connection.

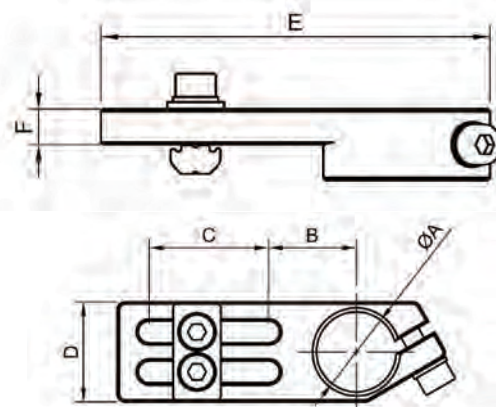
Product Code	A	B	C	D	E	Weight
ACH.10.L	10	16	20	20	18	25g
ACH.10.X	10	19,5	25	25	12,5	50g
ACH.14.X	14	21,5	25	25	12,5	51g
ACH.20.X	20	24,5	32	30	12,5	77g
ACH.20.J	20	33	35	40	20	105g
ACH.30.J	30	39	45	45	20	162g



Material: Aluminium.
ACS clamps allow for mounting flexibility.
Kit with screws.

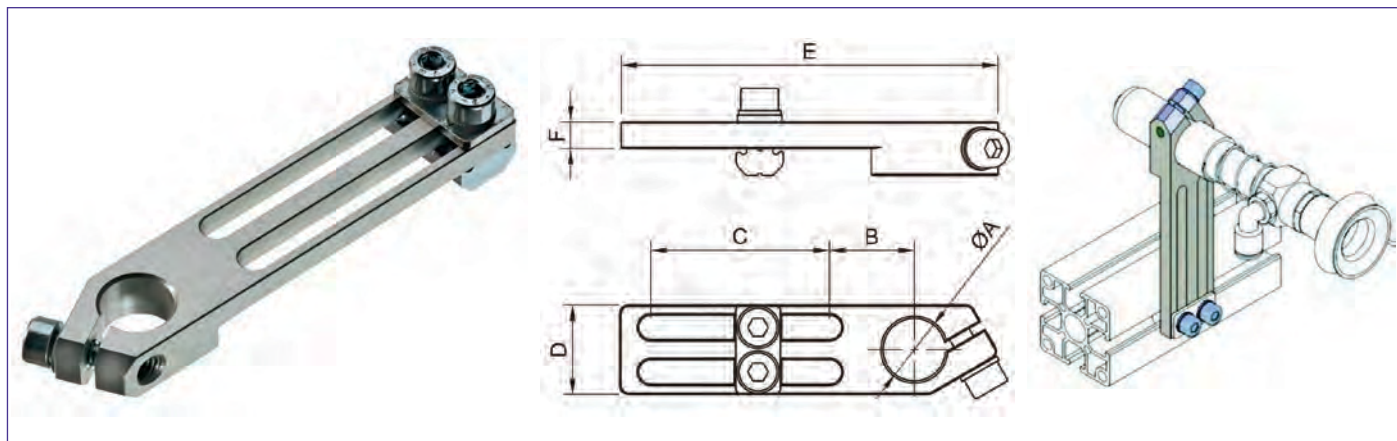
Product Code	A	B	C	D	E	F	G	Weight
ACS.10.L	10	12,2	9	16	42	8	18	21g
ACS.10.X	10	12,2	15	16	49	8	25	22g
ACS.14.X	14	15	15	20	55	12	25	37g
ACS.20.X	20	18	15	25	63	15	25	50g
ACS.20.J	20	18	30	25	78	15	40	54g
ACS.30.X	30	23,5	15	35	75,5	20	25	82g
ACS.30.J	30	23,5	29	35	90,5	20	40	92g

Medium Angle Clamp



Material: Aluminium.
ACM clamps allow for mounting flexibility.
Kit with screws.

Product Code	A	B	C	D	E	F	Weight
ACM.1020.L	10	16,5	20	16	56	4	23g
ACM.1425.X	14	19	25	20	70	6	36g
ACM.2035.X	20	22	35	25	82	7,5	55g
ACM.3035.X	30	28,5	35	35	96	10	94g



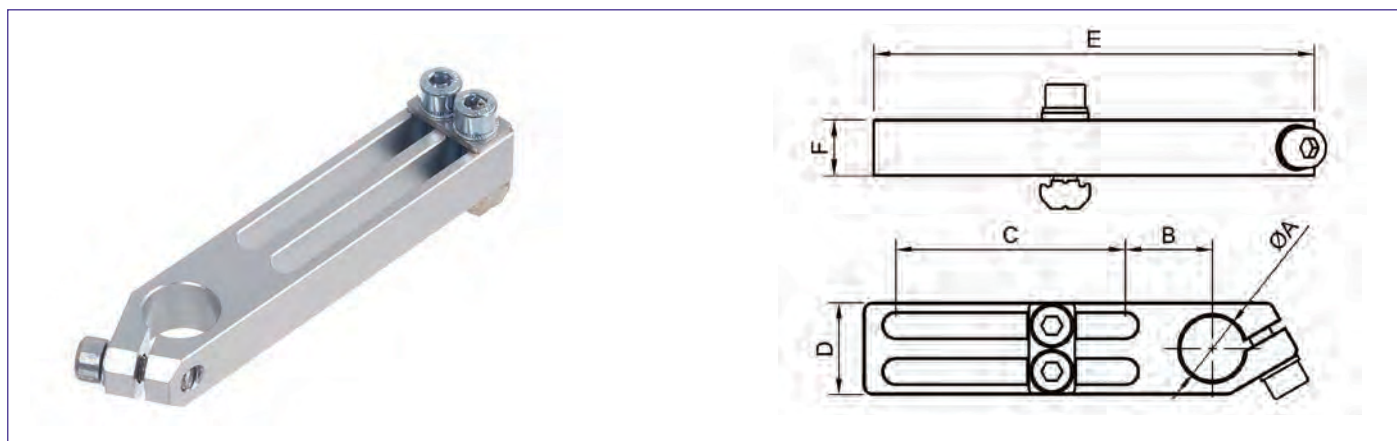
Material: Aluminium.

ACL clamps allow for mounting flexibility.

Kit with screws.

Product Code	A	B	C	D	E	F	Weight
ACL.1040.L	10	16,5	40	16	76	4	24g
ACL.1040.X	10	16,5	40	16	76	4	24g
ACL.1440.X	14	19	40	20	85	6	39g
ACL.1450.X	14	19	50	20	95	6	42g
ACL.2060.X	20	22	60	25	112	7,5	62g
ACL.2070.J	20	22	70	28	123	7,5	77g
ACL.3060.X	30	28,5	60	35	126	10	113g
ACL.3070.J	30	28,5	70	35	136	10	130g

Long Angle Clamp Heavy Duty

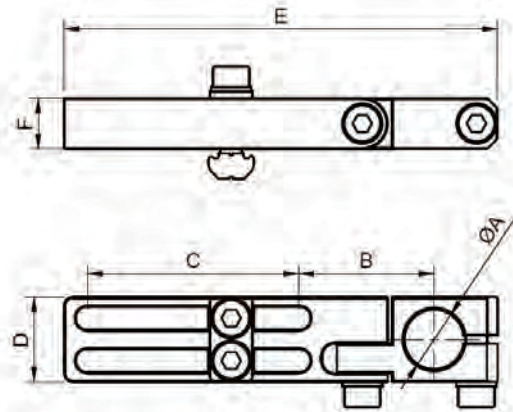


Material: Aluminium.

ACLH Heavy duty clamps allow for mounting flexibility with higher loads.

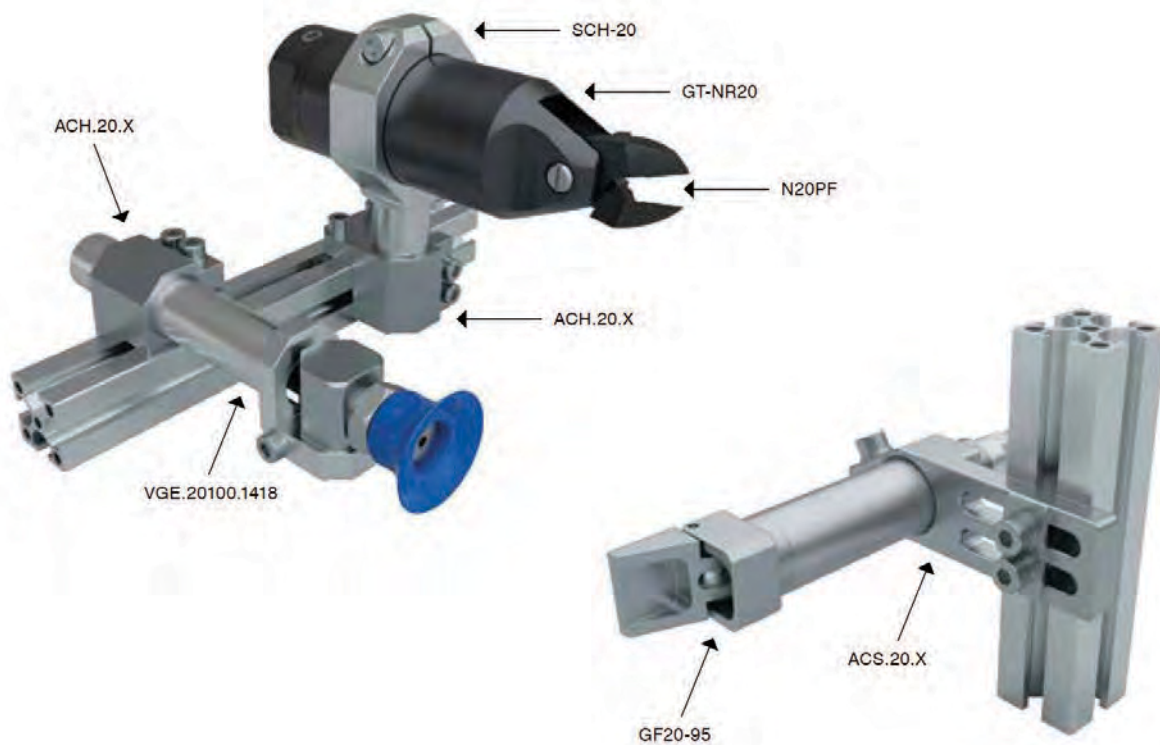
Kit with screws.

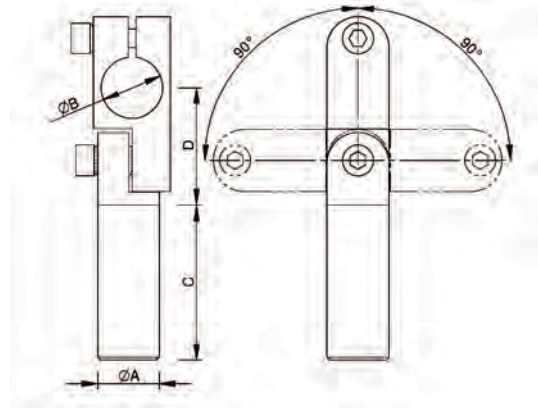
Product Code	A	B	C	D	E	F	Weight
ACLH.1040.X	10	16,5	40	16	76	8	30g
ACLH.1450.X	14	19	50	20	95	12	57g
ACLH.2060.X	20	22	60	25	112	15	90g
ACLH.2070.X	20	22	70	28	123	15	112g
ACLH.3070.J	30	28,5	70	35	136	20	185g



Material: Aluminium.
Increased flexibility in component positioning.
Heavy duty design ensures component stability.

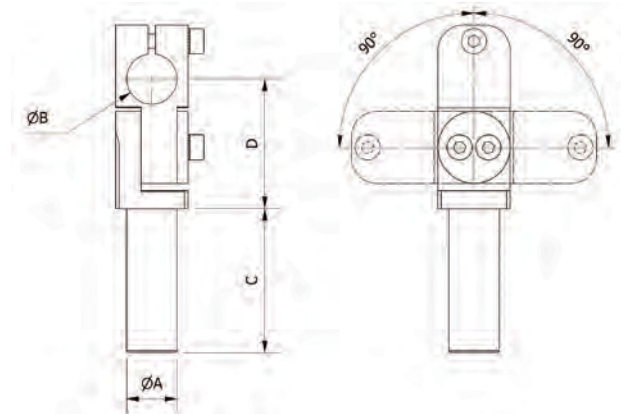
Product Code	A	B	C	D	E	F	Weight
ACLS.1040.X	10	27,5	40	20	86	10	55g
ACLS.1450.X	14	32	50	20	102,5	12	67g
ACLS.2060.X	20	37,5	60	25	124,5	15	115g
ACLS.3080.X	30	50	80	35	166,5	20	254g





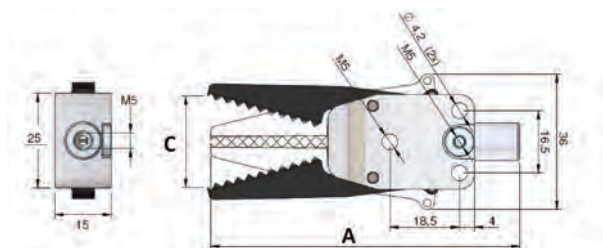
Product Code	A	B	C	D	Weight
MA.GLA.1010.30	10	10	30	22	17g
MA.GLA.1010.60	10	10	60	22	21g
MA.GLA.1010.90	10	10	90	22	28g
MA.GLA.1414.40	14	14	40	30	43g
MA.GLA.1414.80	14	14	80	30	51g
MA.GLA.1414.120	14	14	120	30	70g
MA.GLA.2020.50	20	20	50	38	99g
MA.GLA.2020.100	20	20	100	38	106g
MA.GLA.2020.150	20	20	150	38	165g
MA.GLA.2030.100	20	30	100	47	315g
MA.GLA.3030.100	30	30	100	52,5	315g

Gripper Elbow Arm Heavy Duty



Secure clamping for high loads.

Product Code	A	B	C	D	Weight
MA.GLH.1010.030	10	10	30	30	27g
MA.GLH.1010.060	10	10	60	30	31g
MA.GLH.1010.090	10	10	90	30	37g
MA.GLH.1414.040	14	14	40	36	56g
MA.GLH.1414.080	14	14	80	36	66g
MA.GLH.1414.120	14	14	120	36	83g
MA.GLH.2020.050	20	20	50	45,5	111g
MA.GLH.2020.100	20	20	100	45,5	127g
MA.GLH.2020.150	20	20	150	45,5	169g
MA.GLH.3030.080	30	30	80	60	302g
MA.GLH.3030.140	30	30	140	60	394g
MA.GLH.3030.200	30	30	200	60	509g



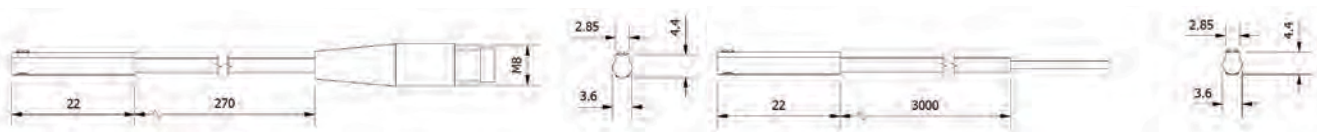
Compressed air in compliance with ISO 8573-1:2010 [7:4:4].
Maximum Operating Pressure 8 bar.

Product Code	C	A	Jaw Type	Sensor	Closing Force (6 bar)	Weight
GZ12-10-10-M	19,5	75	Serrated		30N	40g
GZ12-10-10-C	17,9	75	Curved		30N	36g
GZ12-10-10-CKP	19	76	Curved	PNP	30N	45g
GZ12-10-10-CKN	19	76	Curved	NPN	30N	45g
GZ12-10-10-MC	19	75	1 Serrated/1 Curved		30N	37g
GZ12-10-10-W	20	75,3	Wide		30N	39g
GZ12-10-10-B	13	59,3	Custom		30N	32g
GZ12-10-10-L	20	76,5	Diamond Pattern		30N	36g
GZ12-10-10-L90	19,3	76	Diamond Pattern		30N	43g
GZ12-10-10-LL	19,8	75,3	Smooth		30N	40g
GZ12-10-10-MF	19,6	76,5	Serrated Steel		30N	58g

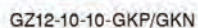
Last Minute Sensor for GZ-12-10

Product Code	Output	Sensor Type	Sensing Distance	Connector	Weight
GZ-SCP-12-10	PNP	Magnetic	0-50mm	M8 4pin	65g

C-Slot Sensor SN



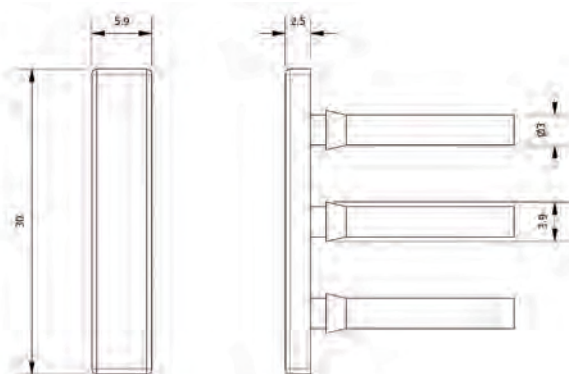
Product Code	Output	Sensor Type	Connector	Lead - m	Weight
SN.K5P.M8	PNP	Electronic	M8 3pin	0,3	4g
SN.K5N.M8	NPN	Electronic	M8 3pin	0,3	4g
SN.K5P.3MW	PNP	Electronic	-	3	4g
SN.K5N.3MW	NPN	Electronic	-	3	4g



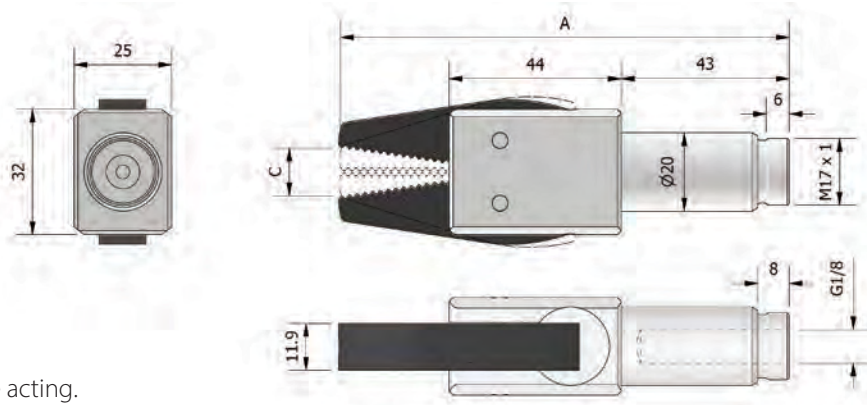
Compressed air in compliance with ISO 8573-1:2010 [7:4:4].
Maximum Operating Pressure 8 bar.

Product Code	C	A	Jaw Type	Sensor	Closing Force (6 bar)	Weight
GZ12-10-10	24	83	Diamond Pattern		30N	40g
GZ12-10-10-KP	23	83	Diamond Pattern	PNP	30N	51g
GZ12-10-10-KN	23	83	Diamond Pattern	NPN	30N	51g
GZ12-10-10-A	21,3	82	Saw Tooth		30N	38g
GZ12-10-10-AKP	23	83	Saw Tooth	PNP	30N	51g
GZ12-10-10-AKN	23	83	Saw Tooth	NPN	30N	51g
GZ12-10-10-G	22,3	82	Viton Rubber Pad		30N	37g
GZ12-10-10-GKP	22	83	Viton Rubber Pad	PNP	30N	48g
GZ12-10-10-GKN	22	83	Viton Rubber Pad	NPN	30N	48g

Jaw Insert Pad - Viton



Product Code	Material	Reference	Weight
GZ-VIT-6	FKM	GZ-12-10-G	4g



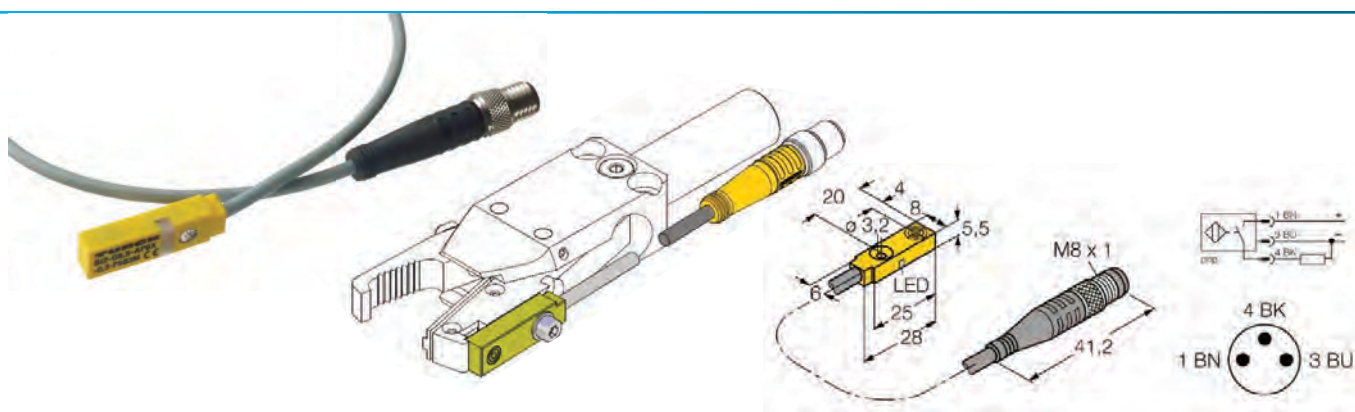
Work principle: Single acting.

Working pressure: 6 bar clean and dry air.

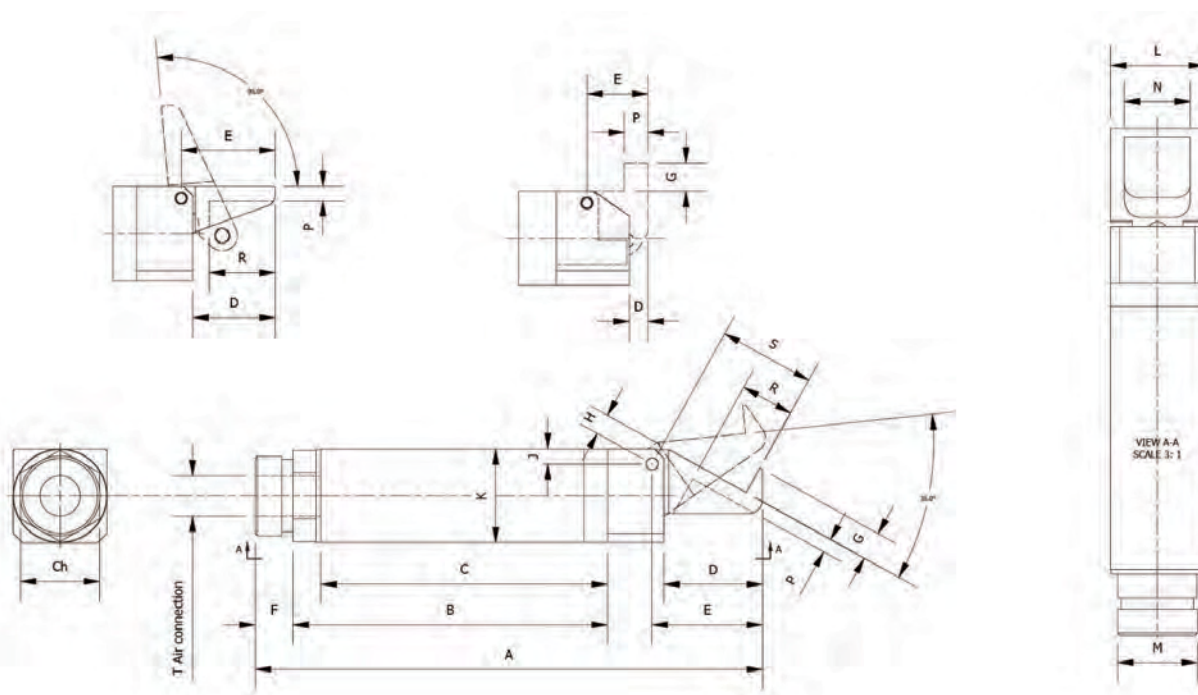
Material: Jaws made of hard-coated Aluminium. Body made of anodized Aluminium.

Product Code	Jaw Type	A	C	Sensor Type	Closing Force (6 bar)	Weight
GZ20-10-A	Custom	100	15		90N	114
GZ20-10-E	Curved	115	21		90N	117
GZ20-10-L	Curved-Smooth	115	23		90N	120
GZ20-10-10	Serrated	115	21		90N	121
GZ20-10-10-S	Serrated	115	21	PNP	90N	127
GZ20-10-10-SN	Serrated	115	21	NPN	90N	127
GZ20-10-W-S	Curved	115	21	PNP	90N	123
GZ20-10-W-SN	Curved	115	21	NPN	90N	123

Sensor for GZ-20

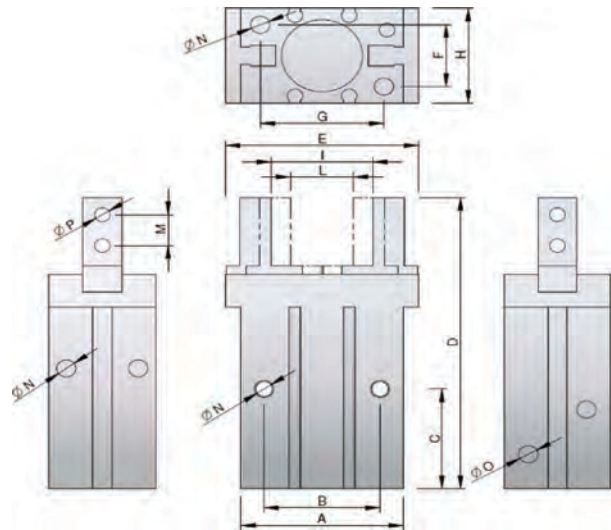


Product Code	Type	Cable Length	Connection
GZ20.SM8.PNP	PNP	300	M8
GZ20.SM8.NPN	NPN	300	M8



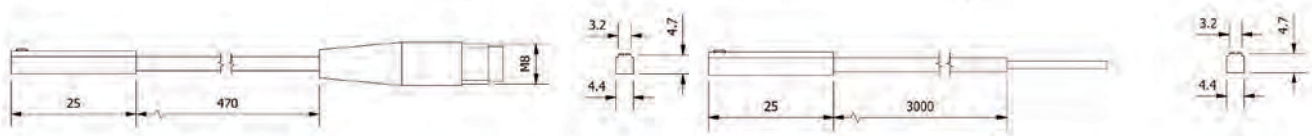
Working Principle: Single acting.
 Working pressure: 6 bar clean, dry air.
 Material: Silver anodised Aluminium.

Product Code	Stroke	Grip Force (6 bar)	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	CH
GF14-35	35°	26N	77	47,5	43,5	14	16	5,5	4,5	3,4	2	Ø14	14	M1xX1	10	2	6	13,5	M5	12
GF20-35	35°	100N	107	66	60	21	23,5	8	6	3,8	2,5	Ø20	20	M17x1	14	3	11,5	20,7	G1/8	17
GF30-35	35°	430N	156	100	92	30	34	11	8	6	4	Ø30	30	M27x1	22	5	17	30,8	G1/8	27
GF14-90	90°	19N	69	45,5	41,5	2	8	5,5			2	Ø14	14	M1xX1	10	4			M5	12
GF20-90	90°	70N	92,5	61	55	2	13	8			2,5	Ø20	20	M17x1	14	5			G1/8	17
GF30-90	90°	300N	135	91	83	2	20	11			4	Ø30	30	M27x1	22	6			G1/8	27
GF14-95	95°	19N	75,5	47,5	43,5	12	14	5,5			2	Ø14	14	M1xX1	10	2	9		M5	12
GF20-95	95°	70N	103,5	66	60	17,5	20	8			2,5	Ø20	20	M17x1	14	3	14		G1/8	17
GF30-95	95°	300N	148	100	90	25	29	11			4	Ø30	30	M27x1	22	5	21		G1/8	27
GF14-95V	95°	19N	75,5	47,5	43,5	12	14	5,5			2	Ø14	14	M1xX1	10	2	9		M5	12
GF20-95V	95°	70N	103,5	66	60	17,5	20	8			2,5	Ø20	20	M17x1	14	3	14		G1/8	17
GF30-95V	95°	300N	148	100	90	25	29	11			4	Ø30	30	M27x1	22	5	21		G1/8	27



Product Code	Bore Size	A	B	C	D	E	F	G	H	I Open	L Closed	Stroke	M	N	O	P	Force (N) Open/Close	Weight
PG-10	10	23	16	23	57	30	12	18	16,5	15,5	11,5	4	5,7	M3	M3	M2.5	22/34	56g
PG-10NO	10	23	16	23	57	30	12	18	16,5	15,5	11,5	4	5,7	M3	M3	M2.5	14/	57g
PG-10L	10	23	16	25	57	35	12	18	16,5	20,3	11	8	5,7	M3	M3	M2.5	22/34	64g
PG-16	16	30,5	24	24,5	67,3	39	15	22	23,5	21	15	6	7	M4	M5	M3	68/90	124g
PG-16NO	16	30,5	24	24,5	67,3	39	15	22	23,5	21	15	6	7	M4	M5	M3	54/	125g
PG-16L	16	30,5	24	31	70	47	15	22	23,5	28	14,7	12	7	M4	M5	M3	68/90	146g
PG-20	20	42	30	29	85	53	18	32	27,5	26,5	16,5	10	9	M5	M5	M4	90/132	236g
PG-20NO	20	42	30	29	85	53	18	32	27,5	26,5	16,5	10	9	M5	M5	M4	70/	238g
PG-20L	20	42	30	36	90	62	18	32	27,5	33,5	16,1	18	9	M5	M5	M4	84/132	273g
PG-25	25	52	36	30	103	71	22	40	33,5	33,5	19,5	14	12	M6	M5	M5	138/204	428g
PG-25NO	25	52	36	30	103	71	22	40	33,5	33,5	19,5	14	12	M6	M5	M5	110/	430g
PG-25L	25	52	36	40	106	75	22	40	33,5	42,6	19,3	22	12	M6	M5	M5	130/208	489g
PG-32	32	60	46	49	113	106	26	46	40	48	26	22	14	M6	M5	M6	320/390	729g

T-Slot Sensor SN.DMSG

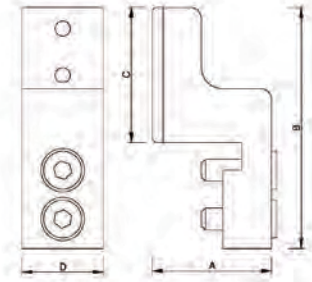


Product Code	Output	Sensor Type	Connector	Lead - m	Ref.	Weight
SN.DMSGP.M8	PNP	Magnetic	M8 3 pin	0.5	PG/AG/CCTQ/CCAQ	4g
SN.DMSGN.M8	NPN	Magnetic	M8 3 pin	0.5	PG/AG/CCTQ/CCAQ	4g
SN.DMSGP.3M	PNP	Magnetic		3	PG/AG/CCTQ/CCAQ	4g
SN.DMSGN.3M	NPN	Magnetic		3	PG/AG/CCTQ/CCAQ	4g

C-Slot Sensor SN.DMSH



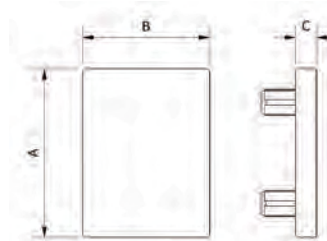
Product Code	Output	Sensor Type	Connector	Lead - m	Ref.	Weight
SN.DMSHP.M8	PNP	Electronic	M8 3 pin	0.5	PG	4g
SN.DMSHN.M8	NPN	Electronic	M8 3 pin	0.5	PG	4g
SN.DMSHP.3M	PNP	Electronic		3	PG	4g
SN.DMSHN.3M	NPN	Electronic		3	PG	4g



Extremely light weight (Material Aluminium).

Product Code	A	B	C	D	E	F	Weight
MA.KB.10	FKM-10	15,5	27	14	10	PG-10	14
MA.KB.16	FKM-16	18,5	35	20	15	PG-16	28
MA.KB.20	FKM-20	22	44,5	25	15	PG-20	41
MA.KB.25	FKM-25	29	55	25	20	PG-25	73
MA.KB.32	FKM-32	36	65,5	36,5	25	PG-32	166

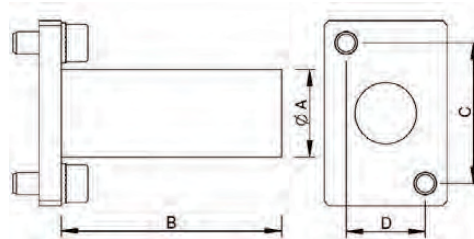
Insert Pad Viton



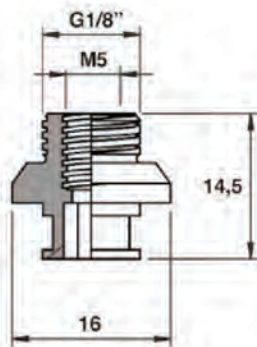
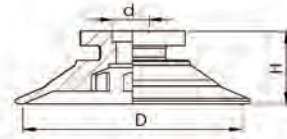
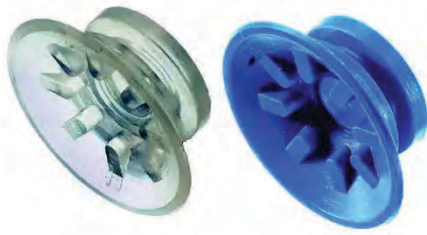
FKM = Viton (fluoroelastomer).

Product Code	A	B	C	Jaw Ref.	Weight
FKM-10	14	10	2.5	PG-10	1
FKM-16	20	15	2.5	PG-16	2
FKM-20	25	13	2	PG-20	1
FKM-25	25	13	2	PG-25	1
FKM-32	30	20	3	PG-32	3

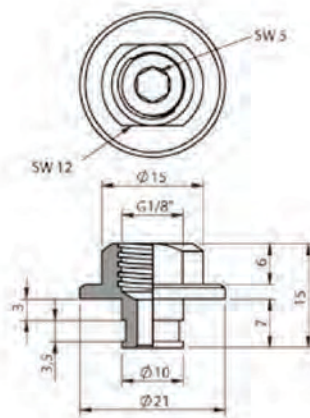
Mounting Bracket for Grippers



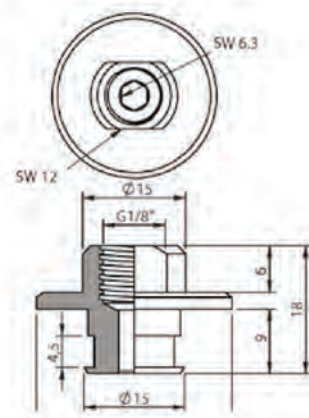
Product Code	A	B	C	D	Ref.	Weight
GA-10	10	30	18	12	PG-10	11
GA-16	14	40	22	15	PG-16	21
GA-20	20	50	32	18	PG-20	38
GA-25	20	50	40	22	PG-25	55
GA-32	20	50	46	26	PG-32	102



F250



F251



F252

Product Code Silicone	Product Code TempFlex HT	D	H	Fitting	Fitting	Fitting
F20S	F20HT	22	8	F250		
F25S	F25HT	28	9	F250		
F30S	F30HT	32	10	F250		
F40S	F40HT	42	13		F251	
F50S	F50HT	53	17,5			F252

Flat Cups

The flat suction cups provide accuracy in load gripping and speeds up the cycle process. Flat cups are used for flat and slightly curved surfaces.



1,5 Bellow Cups

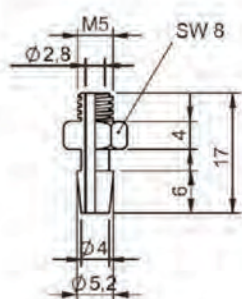
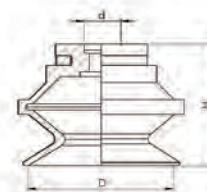
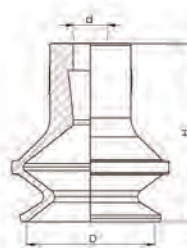
The 1,5 bellow cups combine the advantages of the flat suction cups (precision and positioning) with the freedom of bellows (angle and flexibility). They provide flexibility, precision and low internal volume suitable for high-speed applications.



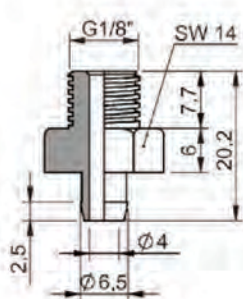
2,5 Bellow Cups

The suction cups with 2,5 bellow are recommended for gripping products with un-even surfaces (large deflection). The 2,5 bellow allow objects to be gripped from an angle (ball-joint effect).

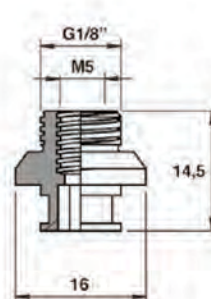




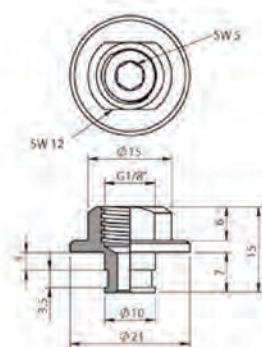
F134



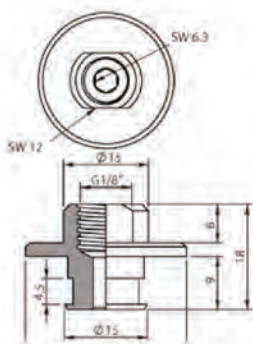
130.003



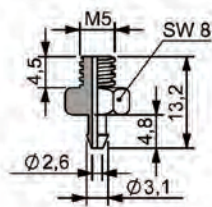
F250



F251

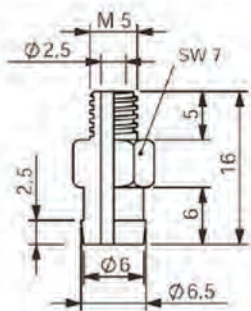
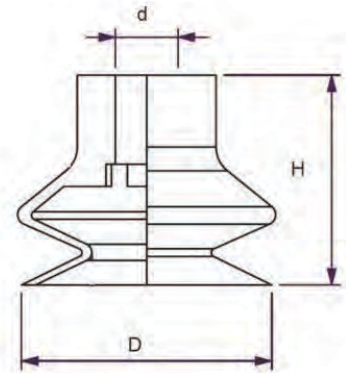
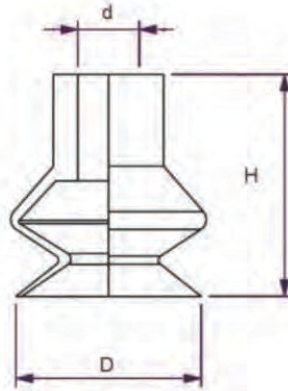


F252

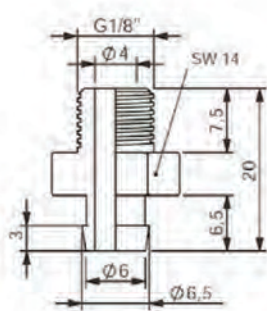


130.591

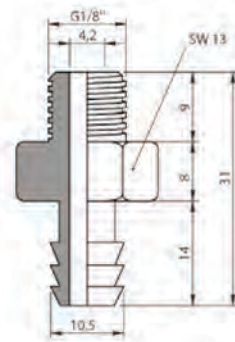
Product Code Silicone	Product Code TempFlex HT	D	D1	d	H	Fitting	Fitting
B05S	B05HT	5		2,6	9,5		130.591
B08S	B08HT	8,8		2	12		130.591
B11S	B11HT	11,0		4	17	F134	130.003
B16S	B16HT	16,0		4	19	F134	130.003
B20S	B20HT	21,5	24,0	4,8	20	F250	
B30S	B30HT	33,0	36,0	6	26	F250	
B40S	B40HT	42,0	46,0	7	28	F251	
B50S	B50HT	52,0	58,0	10,5	35	F252	



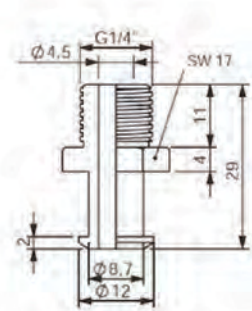
130.013



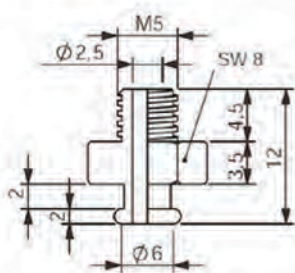
130.003



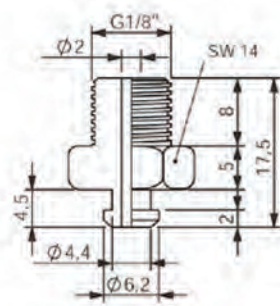
130.132



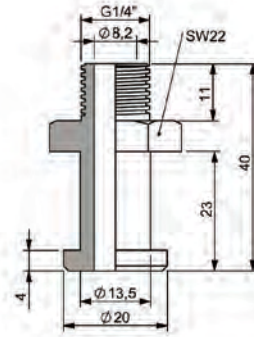
130.190



130.301

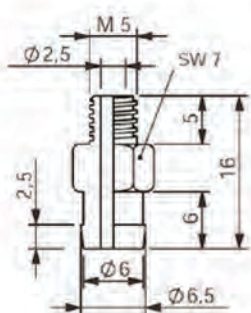
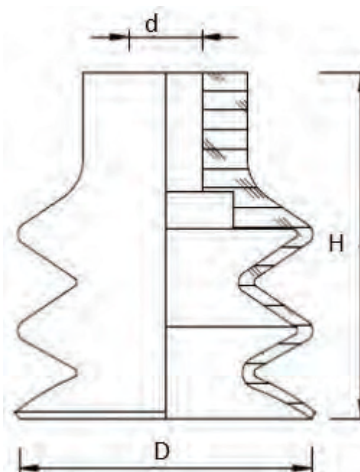


130.009

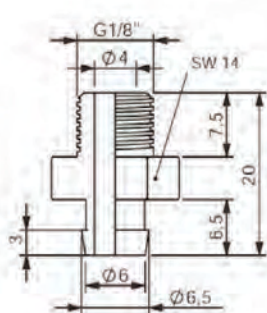


130.622

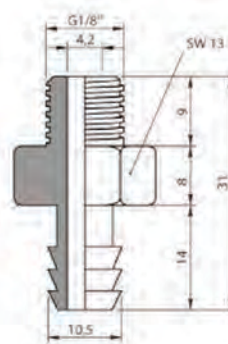
Product Code Silicone	Product Code TempFlex HT	D	d	H	Fitting	Fitting
CL-1.5-06-S	CL-1.5-06-HT	6	4	9	130.301	130.009
CL-1.5-11-S	CL-1.5-11-HT	11	5	16	130.013	130.003
CL-1.5-14-S	CL-1.5-14-HT	14	5	15	130.013	130.003
CL-1.5-16-S	CL-1.5-16-HT	16	5	19	130.013	130.003
CL-1.5-20-S	CL-1.5-20-HT	20	4	16	130.013	130.003
CL-1.5-25-S	CL-1.5-25-HT	25	4	23	130.013	130.003
CL-1.5-30-S	CL-1.5-30-HT	33	8	28	130.132	130.190
CL-1.5-43-S	CL-1.5-43-HT	43	8	28	130.132	130.190
CL-1.5-53-S	CL-1.5-53-HT	53	8	34	130.132	130.190
CL-1.5-63-S	CL-1.5-63-HT	63	8	34	130.132	130.190
CL-1.5-78-S	CL-1.5-78-HT	78	12	47	130.622	



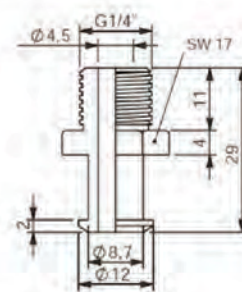
130.013



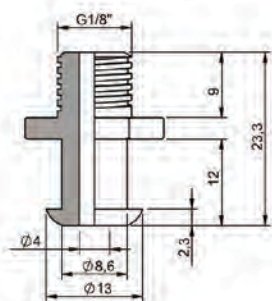
130.003



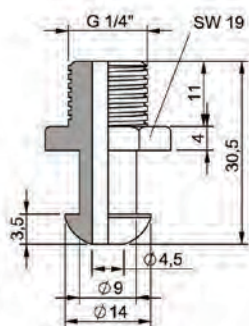
130.132



130.190

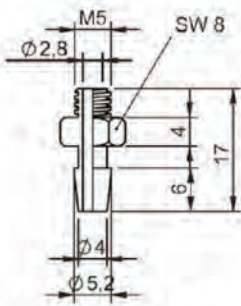
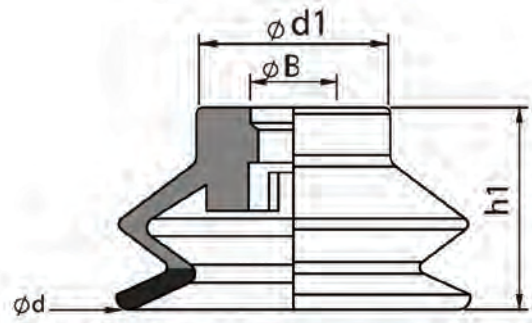


130.093

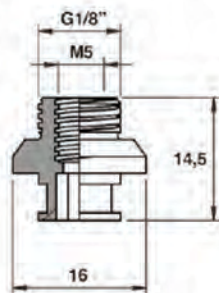


130.281

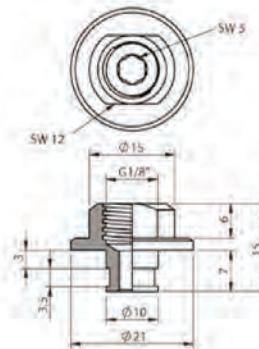
Product Code Silicone	Product Code TempFlex HT	D	d	H	Fitting	Fitting
CL-2.5-5	CL-2.5-5-HT	5	4	14	130.013	130.003
CL-2.5-7	CL-2.5-7-HT	7	3,8	14	130.013	130.003
CL-2.5-9	CL-2.5-9-HT	9	4	15	130.013	130.003
CL-2.5-12	CL-2.5-12-HT	12	5	21	130.013	130.003
CL-2.5-14	CL-2.5-14-HT	14	4	22	130.013	130.003
CL-2.5-20	CL-2.5-20-HT	20	4,5	23	130.013	130.003
CL-2.5-25	CL-2.5-25-HT	25	4	34	130.013	130.003
CL-2.5-32	CL-2.5-32-HT	32	8	37	130.132	130.190
CL-2.5-42	CL-2.5-42-HT	42	8	46	130.132	130.190
CL-2.5-52	CL-2.5-52-HT	52	8	49	130.132	130.190
CL-2.5-62	CL-2.5-62-HT	62	9	53	130.093	130.281



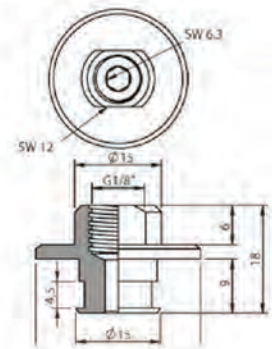
F134



F250



F251

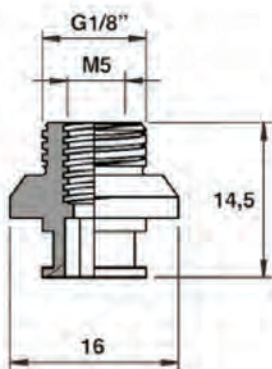
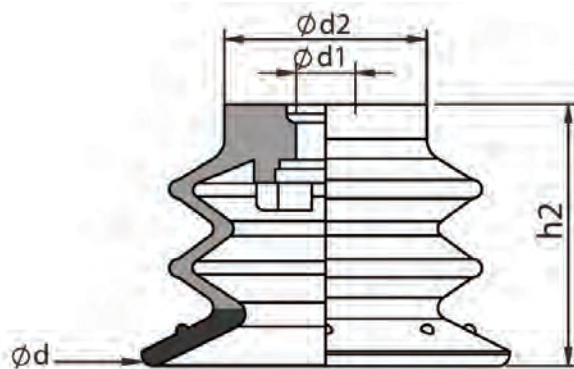


F252

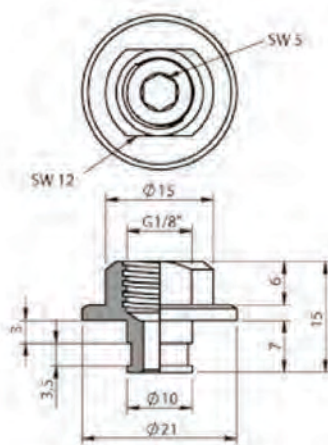
Multiflex vacuum cups offer outstanding advantages

- Extremely high wear resistance
- Very high lifting force
- Best static friction qualities
- No sticking tendency
- Elasticity remains unchanged for minus temperatures
- Working temperatures from -20°C to + 80°C
- Anti marking

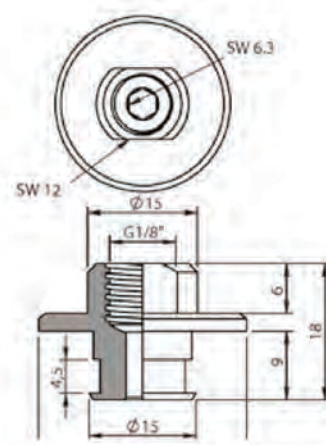
Product Code	d	B	d1	h1	Hardness	Fitting	Fitting	Fitting	Fitting
B15-10MF	10	3,9	9	16,5	40	F134			
B15-16MF	16	3,9	9	19	30/60	F134			
B15-20MF	21	5,2	12	18	30/60		F250		
B15-30MF	31	6,5	16,8	17	30/60			F251	
B15-40MF	41	6,3	22,4	22,4	30/60			F251	
B15-50MF	51	10,5	28	29,2	30/60				F252



F250



F251



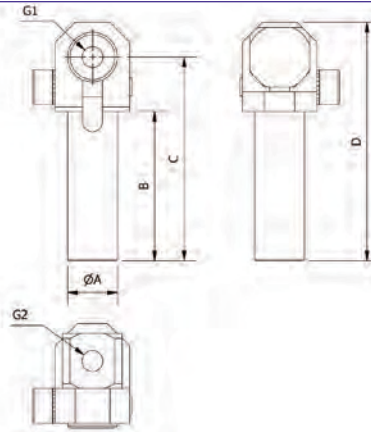
F252

Multiflex vacuum cups offer outstanding advantages

- Extremely high wear resistance
- Very high lifting force
- Best static friction qualities
- No sticking tendency
- Elasticity remains unchanged for minus temperatures
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- Anti marking

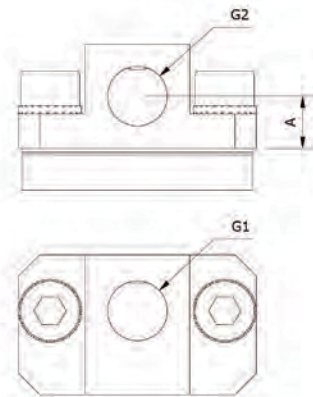
Product Code	d	d1	d2	h2	Hardness	Fitting	Fitting	Fitting
B25-20MF	20,5	5	12	14,8	30/60	F250		
B25-25MF	26	5	15,4	18,9	30/60	F250		
B25-30MF	30	5	16,5	21,3	30/60	F250		
B25-35MF	35	6,5	21	25,63	30/60		F251	
B25-40MF	40	6,5	22	28,4	30/60		F251	
B25-50MF	50	10,5	27,5	35,5	30/60			F252

Allows optimal positioning of vacuum to part contour.
Angle adjustable between 0° and 90°.
Side vacuum port.



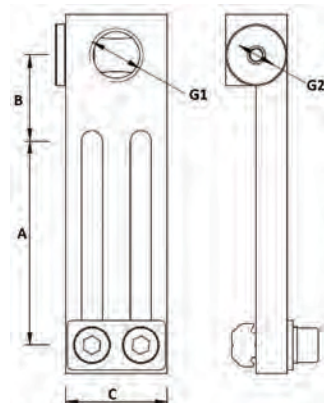
Product Code	A	B	C	D	G1	G2	Weight
VGE.10030.0505	10	30	41	48	M5	M5	14g
VGE.10060.0505	10	60	71	78	M5	M5	17g
VGE.10090.0505	10	90	101	108	M5	M5	20g
VGE.14040.1818	14	40	56	65	G 1/8	G 1/8	29g
VGE.14080.1818	14	80	96	105	G 1/8	G 1/8	38g
VGE.14120.1818	14	120	136	145	G 1/8	G 1/8	45g
VGE.20050.1418	20	50	68	80	G 1/8	G 1/4	56g
VGE.20100.1418	20	100	118	130	G 1/8	G 1/4	70g
VGE.20150.1418	20	150	168	180	G 1/8	G 1/4	87g
VGE.20050.1414	20	50	68	80	G 1/4	G 1/4	55g
VGE.20100.1414	20	100	118	130	G 1/4	G 1/4	69g
VGE.20150.1414	20	150	168	180	G 1/4	G 1/4	86g

Vacuum Cup Mounting Bracket



Vacuum connection for use when space is limited.

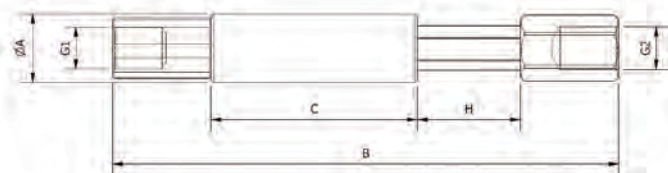
Product Code	A	G1	G2	Weight
VMB.0505.X	4	M5	M5	27g
VMB.1818.X	7,5	G 1/8	G 1/8	35g
VMB.1414.X	10	G 1/4	G 1/4	39g



Allows inline adjustment of vacuum cup position.

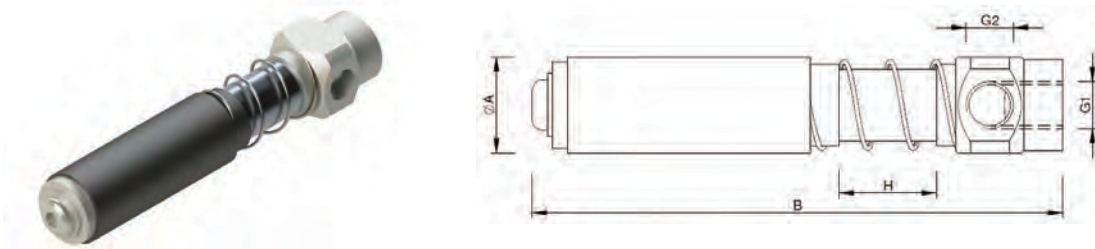
Product Code	A	B	C	G1	G2	Weight
VML0505.40.L	40	14	16	M5	M5	24g
VML1818.50.X	50	21	25	G 1/8	G 1/8	65g
VML1418.50.X	50	21	25	G 1/4	G 1/8	65g
VML1414.50.J	50	23	25	G 1/4	G 1/4	73g

Rod For Vacuum Cups



Body and rod made of aluminium - anodized.
Non Rotative.

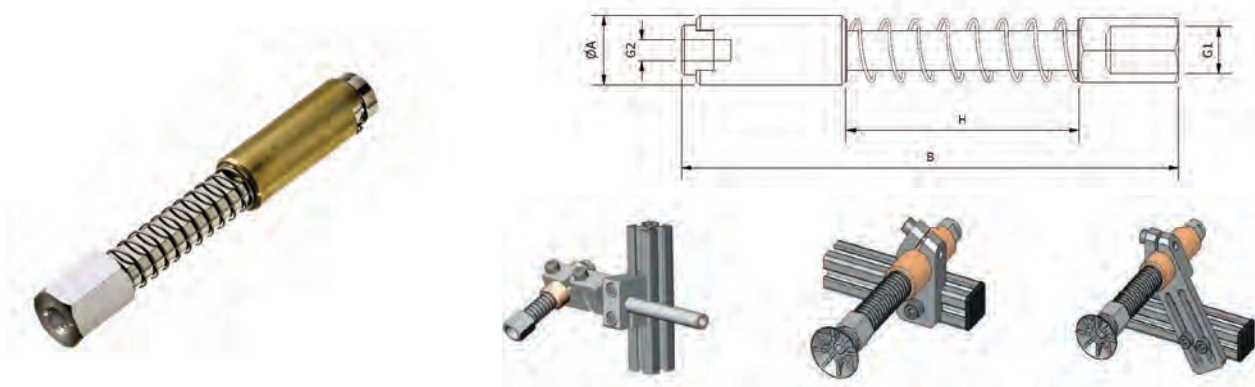
Product Code	A	B	C	G1	G2	H	F(N)	Weight
MPSDN.1010	10	61	26	M5	M5	10	3,6	8g
MPSDN.1025	10	91	41	M5	M5	25	3,7	11g
MPSDN.1420	14	103	42	G 1/8	G 1/8	20	8,9	25g
MPSDN.1435	14	135	60	G 1/8	G 1/8	35	9,5	32g
MPSDN.2025	20	114	55	G 1/8	G 1/8	25	11	63g
MPSDN.2050	20	167	82	G 1/8	G 1/8	50	11,4	81g
MPSDN.2025.14	20	114	55	G 1/4	G 1/4	25	11	59g
MPSDN.2050.14	20	161	82	G 1/4	G 1/4	50	11,4	77g



For use with round vacuum cups only.

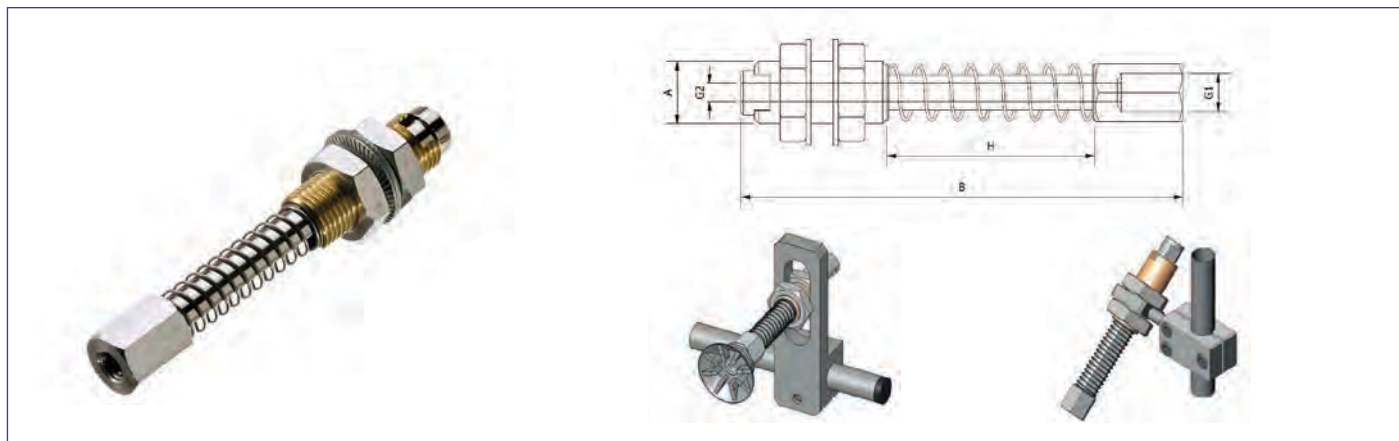
Product Code	A	B	G1	G2	H	F(N)	Weight
MA.GGD.10050510	10	59	M5	M5	10	8	11g
MA.GGD.10050530	10	85	M5	M5	30	11	15g
MA.GGD.14181815	14	84	G 1/8	G 1/8	15	9	33g
MA.GGD.14181840	14	109	G 1/8	G 1/8	40	14,6	38g
MA.GGD.20141820	20	109	G 1/4	G 1/8	20	11,7	76g
MA.GGD.20141850	20	147	G 1/4	G 1/8	50	16,8	92g

Level Compensator Smooth Body (Non-rotative)



Spring: Steel.
Sliding Parts: Chrome-plated Brass.
Terminal Parts: Anodized Aluminium.

Product Code	A	B	G1	G2	H	F(N)	Weight
LC.10.20	10	69	M5	M5	20	3,4	26g
LC.12.20	12	69	M5	M5	20	18,4	33g
LC.14.38	14	100	G 1/8	M5	38	23,3	63g
LC.20.48	20	125	G 1/4	G 1/8	48	16,6	155g

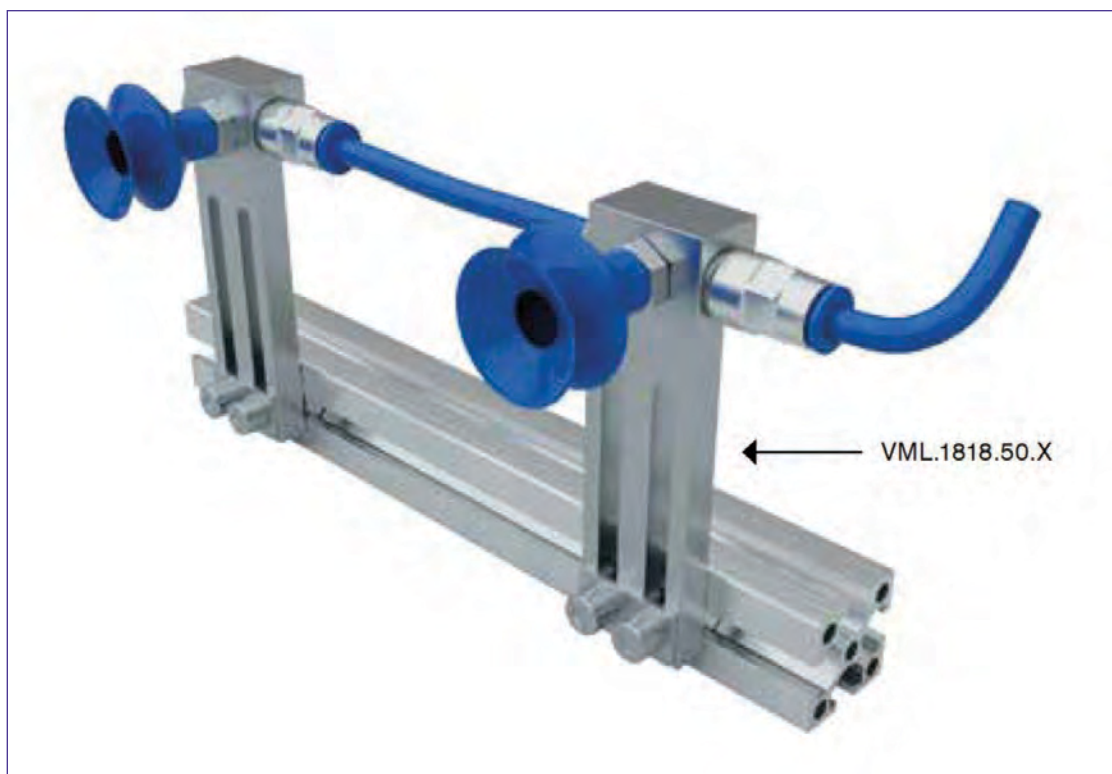


Spring: Steel.

Sliding Parts: Chrome-plated Brass.

Terminal Parts: Anodized Aluminium.

Product Code	A	B	G1	G2	H	F(N)	Weight
LC.M10.20	M10x1	70	M5	M5	20	3,4	36g
LC.M12.20	M12x1.25	77	G 1/8	M5	20	6	40g
LC.M14.38	M14x1.5	100	G 1/8	M5	38	23,2	71g
LC.M20.48	M20x1.5	125	G 1/4	G 1/8	48	16,7	189g





DIE SETS

■ ■ Rear Pillar	222
■ ■ Reverse Rear Pillar	224
■ ■ Four Pillar	224
■ ■ Custom	225

PINS & BUSHES

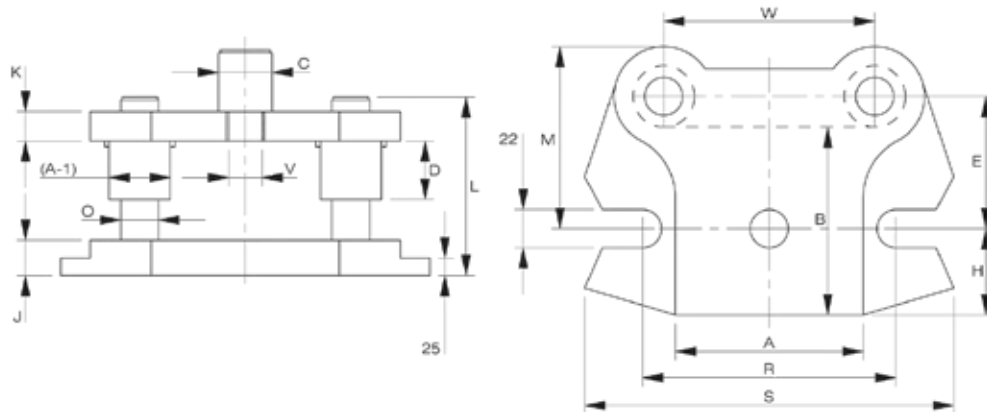
■ ■ Standard Die Set Press Fit Pin	226
■ ■ Line Ream Stepped Pin	227
■ ■ Oil-less Demountable Guide Bushes	228
■ ■ Oil-Less Press Fit Bush	229
■ ■ Bolt on Ball Bearing Pin and Bush Assemblies	230
■ ■ Oil-less Bolt on Pin and Bush Assemblies	231
■ ■ EBB Ball Bearing Pin and Bush	232
■ ■ PPS Ball Bearing Pin and Bush	233
■ ■ Exacta Ball Bearing Pin and Bush	234
■ ■ A1 Ball Bearing Pin and Bush	235

PUNCHES & DIES

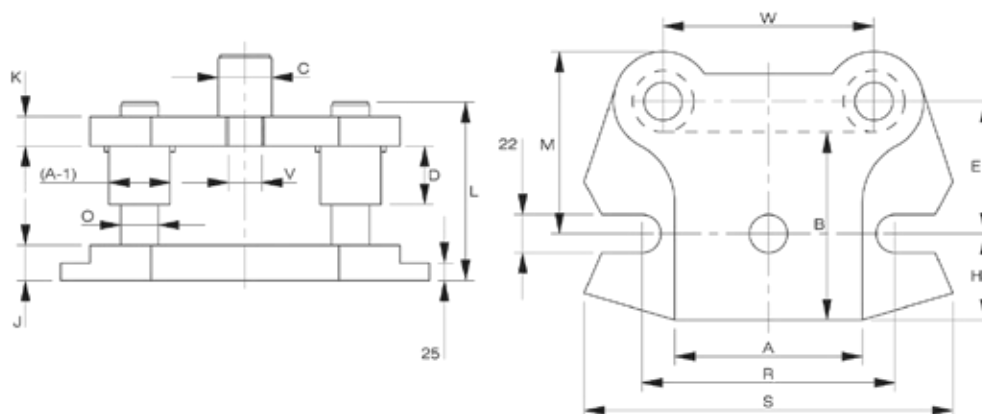
■ ■ Blank Punches	236
■ ■ Blank Shedder Punches	238
■ ■ Form D Precision Punches	240
■ ■ DIN Die Buttons - Form B (Headed)	246
■ ■ DIN Die Buttons - Form A (Headless)	249
■ ■ ISO Standard Punches	253
■ ■ ISO Standard Die Buttons Press Fit	255
■ ■ Die Button Shoulders	256
■ ■ Custom Punches	259

PRESS TOOLING ACCESSORIES

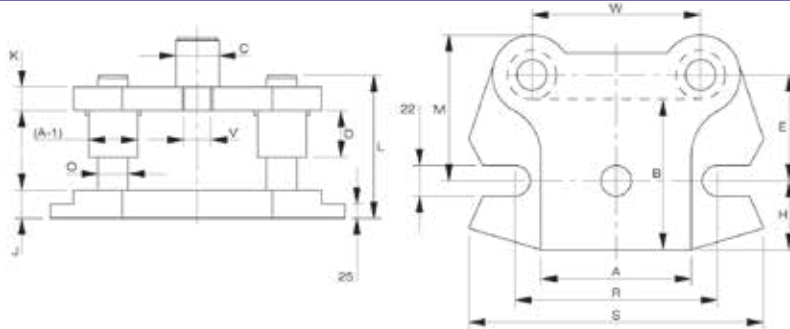
■ ■ Drill Guide - Precision (Headed)	260
■ ■ Drill Guides - Precision (Headless)	263



Product Code	Die Area		Shank Dia	Pin Length	General Dimensions											BSF
	A	B	C	L	W	E	H	J	K	M	O	A-1	R	S	D	V
	Inches				Millimetres											Inches
HRPS-33A	3	3	1 1/4	4 1/2	76.2	55.5	38.1	22.2	22.2	84.1	0.7355	28.63	152.4	203	44.47	3/4
HRPS-44A	4	4	1 1/2	4 1/2	101.6	68.2	50.8	35	30.5	96.8	0.7355	28.63	171.4	222.2	44.47	1
HRPS-55A	5	5	2	5 3/4	127	84.1	63.5	38.5	30.5	119	0.9855	44.45	196.8	247.6	57.15	1 1/4
HRPS-64A	6	4	2	5 3/4	152.4	71.4	50.8	38.5	30.5	106.3	0.9855	44.45	222.2	273	57.15	1 1/4
HRPS-66A	6	6	2	5 3/4	152.4	96.8	76.2	38.5	30.5	131.7	0.9855	44.45	222.2	273	57.15	1 1/4
HRPS-75A	7	5	2	5 3/4	177.8	84.1	63.5	38.5	30.5	119	0.9855	44.45	247.6	298.4	57.15	1 1/4
HRPS-75B	7	5	2	6 1/2	177.8	84.1	63.5	48.5	30.5	119	0.9855	44.45	247.6	298.4	57.15	1 1/4
HRPS-86A	8	6	2	5 3/4	203.2	96.8	76.2	38.5	30.5	131.7	0.9855	44.45	273	323.8	57.15	1 1/4
HRPS-86B	8	6	2	6 1/2	203.2	96.8	76.2	48.5	30.5	131.7	0.9855	44.45	273	323.8	57.15	1 1/4
HRPS-88A	8	8	2	5 3/4	203.2	122.2	101.6	38.5	30.5	157.1	0.9855	44.45	273	323.8	57.15	1 1/4
HRPS-88B	8	8	2	6 1/2	203.2	122.2	101.6	48.5	30.5	157.1	0.9855	44.45	273	323.8	57.15	1 1/4
HRPS-95A	9	5	2	5 3/4	228.6	84.1	63.5	38.5	30.5	119	0.9855	44.45	297.2	349.2	57.15	1 1/4
HRPS-95B	9	5	2	6 1/2	228.6	84.1	63.5	48.5	30.5	119	0.9855	44.45	297.2	349.2	57.15	1 1/4
HRPS-97A	9	7	2	5 3/4	228.6	109.5	88.9	38.5	30.5	144.4	0.9855	44.45	297.2	349.2	57.15	1 1/4
HRPS-97B	9	7	2	6 1/2	228.6	109.5	88.9	48.5	30.5	144.4	0.9855	44.45	297.2	349.2	57.15	1 1/4
HRPS-106A	10	6	2	5 3/4	254.0	96.8	76.2	38.5	30.5	131.7	0.9855	44.45	323.8	374.6	57.15	1 1/4
HRPS-106B	10	6	2	6 1/2	254.0	96.8	76.2	48.5	30.5	131.7	0.9855	44.45	323.8	374.6	57.15	1 1/4
HRPS-118A	11	8	2	5 3/4	279.4	125.4	101.6	38.5	30.5	166.7	1.2355	53.97	349.2	400	60.33	1 1/4
HRPS-118B	11	8	2	6 1/2	279.4	125.4	101.6	48.5	30.5	166.7	1.2355	53.97	349.2	400	60.33	1 1/4
HRPS-126A	12	6	2	5 3/4	304.8	100	76.2	38.5	30.5	141.3	1.2355	53.97	374.6	425.4	60.33	1 1/4
HRPS-126B	12	6	2	6 1/2	304.8	100	76.2	48.5	30.5	141.3	1.2355	53.97	374.6	425.4	60.33	1 1/4
HRPS-128A	12	8	2	5 3/4	304.8	125.4	101.6	38.5	30.5	166.7	1.2355	53.97	374.6	425.4	60.33	1 1/4
HRPS-128B	12	8	2	6 1/2	304.8	125.4	101.6	48.5	30.5	166.7	1.2355	53.97	374.6	425.4	60.33	1 1/4
HRPS-1210A	12	10	2	5 3/4	304.8	154.0	127	38.5	30.5	195.3	1.2355	53.97	374.6	425.4	60.33	1 1/4

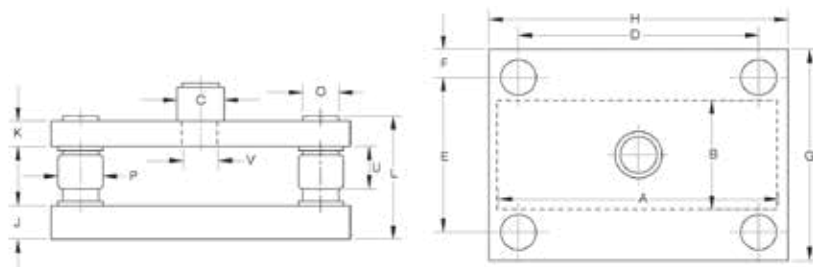
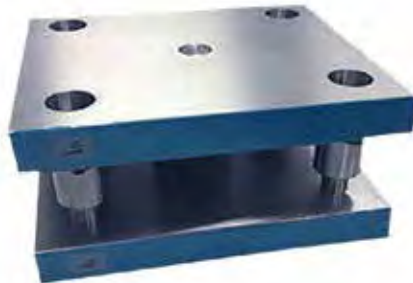


Product Code	Die Area		Shank Dia	Pin Length	General Dimensions											BSF
	A	B	C	L	W	E	H	J	K	M	O	A-1	R	S	D	V
	Inches				Millimetres											Inches
HRPS-146A	14	6	2	5 3/4	355.6	100	76.2	38.5	30.5	141.3	1.2355	53.97	425.4	476.2	60.33	1 1/4
HRPS-146B	14	6	2	6 1/2	355.6	100	76.2	48.5	30.5	141.3	1.2355	53.97	425.4	476.2	60.33	1 1/4
HRPS-148A	14	8	2	5 3/4	355.6	125.4	101.6	38.5	30.5	166.7	1.2355	53.97	425.4	476.2	60.33	1 1/4
HRPS-148B	14	8	2	6 1/2	355.6	125.4	101.6	48.5	30.5	166.7	1.2355	53.97	425.4	476.2	60.33	1 1/4
HRPS-1410A	14	10	2	5 3/4	355.6	157.1	127	38.5	38.5	206.3	1.4855	60	431.8	482.6	69.85	1 1/4
HRPS-1410B	14	10	2	6 1/2	355.6	157.1	127	48.5	38.5	206.3	1.4855	60	431.8	482.6	69.85	1 1/4
HRPS-1414A	14	14	2	5 3/4	355.6	207.6	177.8	38.5	38.5	258.4	1.4855	60	389.2	457.2	69.85	1 1/4
HRPS-1612A	16	12	2	8 1/2	406.4	182.6	152.4	38.5	38.5	233.4	1.4855	60	440	508	69.85	1 1/4
HRPS-187B	18	7	2	10	457.2	119.1	88.9	48.5	48.5	169.9	1.4855	60	490.8	558.8	69.85	1 1/4
HRPS-189B	18	9	2	10	457.2	144.5	144.3	48.5	48.5	195.3	1.4855	60	490.8	558.8	69.85	1 1/4
HRPS-1814A	18	14	2	8 1/2	457.2	208	177.8	38.5	38.5	265.1	1.4855	60	502.9	571.5	69.85	1 1/4
HRPS-1814B	18	14	2	10	457.2	208	177.8	48.5	48.5	265.1	1.7355	66.68	502.9	571.5	76.18	1 1/4
HRPS-1818A	18	18	2	8 1/2	457.2	228.6	177.8	38.5	38.5	320.7	1.7355	66.68	503.5	571.5	76.18	1 1/4
HRPS-1818B	18	18	2	10	457.2	228.6	177.8	48.5	48.5	320.7	1.7355	66.68	503.5	571.5	76.18	1 1/4
HRPS-2010A	20	10	2	8 1/2	508	161.9	127	38.5	38.5	219.1	1.4855	60	554.3	622.3	69.85	1 1/4
HRPS-2214A	22	14	2	8 1/2	558	212.7	177.8	38.5	38.5	269.9	1.7355	66.68	604.5	673.1	76.18	1 1/4
HRPS-2214B	22	14	2	10	558	212.7	177.8	48.5	48.5	269.9	1.7355	66.68	604.5	673.1	76.18	1 1/4
HRPS-246A	24	6	2	8 1/2	609.8	111.1	76.2	38.5	38.5	168.3	1.4855	60	655.9	732.9	69.85	1 1/4
HRPS-246B	24	6	2	10	609.8	111.1	76.2	48.5	48.5	168.3	1.7355	66.68	655.9	732.9	76.18	1 1/4
HRPS-249A	24	9	2	8 1/2	609.8	149.2	114.3	38.5	38.5	206.4	1.4855	60	655.9	732.9	69.85	1 1/4
HRPS-2412A	24	12	2	8 1/2	609.8	152.4	244.5	38.5	38.5	609.6	1.7355	66.68	655.3	732.9	76.18	1 1/4
HRPS-2412B	24	12	2	10	609.8	152.4	244.5	48.5	48.5	609.6	1.7355	66.68	655.3	732.9	76.18	1 1/4
HRPS-306A	30	6	2	8 1/2	762	111.1	76.2	38.5	38.5	168.3	1.4855	60	808.3	876.3	69.85	1 1/4
HRPS-309B	30	9	2	10	762	149.2	114.3	48.5	48.5	206.4	1.7355	66.68	808.3	876.3	76.18	1 1/4



Product Code	Die Area		Shank Dia	Pin Length	General Dimensions											BSF
	A	B	C	L	W	E	H	J	K	M	O	A-1	R	S	D	V
	Inches				Millimetres											Inches
HRRS-58A	5	8	2	5 3/4	142.9	122.2	101.6	38.5	30.5	157.1	0.9855	44.45	212.7	263.5	57.15	1 1/4
HRRS-710A	7	10	2	5 3/4	225.4	134.9	127	38.5	30.5	176.2	1.2355	53.97	246.7	298.4	60.33	1 1/4
HRRS-710B	7	10	2	6 1/2	225.4	134.9	127	48.5	30.5	176.2	1.2355	53.97	246.7	298.4	60.33	1 1/4

Four Pillar Steel Die Set

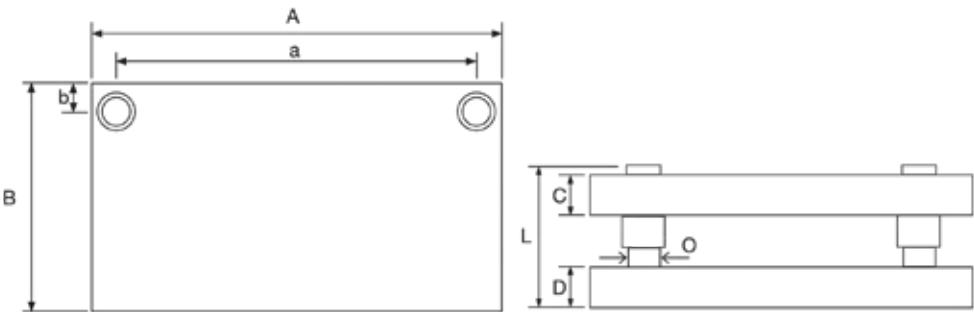


Product Code	Die Area		Shank Dia	Pin Length	General Dimensions							Pin Dia	Bush	BSF
	A	B	C	L	D	E	G	H	J	K	P	O	U	V
	Inches				Millimetres							Inches		
H4PS-106A	10	5 1/2	2	5 3/4	235	187.3	276	323.9	40	40	44.45	0.9855	57.17	1 1/4
H4PS-126A	12	5 1/2	2	5 3/4	279.4	193.7	289	374.7	40	40	53.97	1.2355	60.33	1 1/4
H4PS-128A	12	7 1/2	2	5 3/4	279.4	244.5	340	374.7	40	40	53.97	1.2355	60.33	1 1/4
H4PS-146A	14	5 1/2	2	5 3/4	330.2	193.7	289	425.5	40	40	53.97	1.2355	60.33	1 1/4
H4PS-1410A	14	9 1/2	2	5 3/4	330.2	295.3	390	425.5	40	40	53.97	1.2355	60.33	1 1/4
H4PS-166A	16	5 1/2	2	5 3/4	381	193.7	289	476.3	40	40	53.97	1.2355	60.33	1 1/4
H4PS-168A	16	7 1/2	2	5 3/4	381	257.2	340	476.3	40	40	53.97	1.2355	60.33	1 1/4

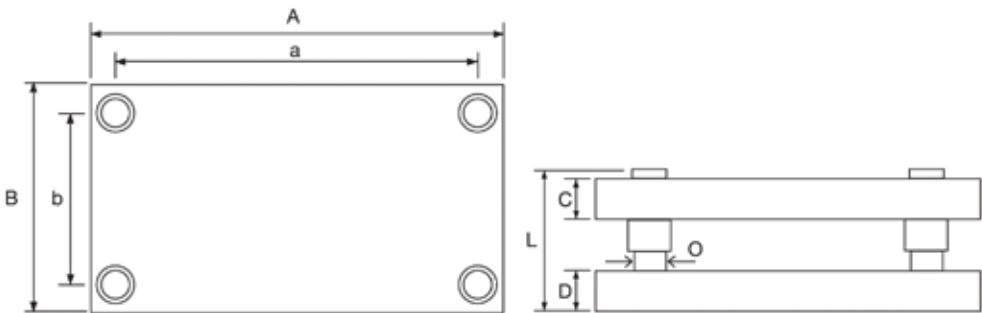


The following options are available on request:

- Ball Bearing Bushings
- Drilling and Tapping (Detailed drawing required)
- Pocketing (Detailed drawing required)



2 Pillar							
A	B	C	D	a	b	L	O



4 Pillar							
A	B	C	D	a	b	L	O



Hales Standard Die Set Press Fit Pins

Materials: Deep core strength case hardened materials

Compatible with: HB Bush
HRB Bush
on following pages



Tolerance	
D	+0
	-0.0002"

Product Code	D	L
HP034-412	0.7355	4 1/2
HP034-512	0.7355	5 1/2
HP034-7	0.7355	7
HP034-8	0.7355	8
HP1-412	0.9855	4 1/2
HP1-514	0.9855	5 1/4
HP1-534	0.9855	5 3/4
HP1-612	0.9855	6 1/2
HP1-7	0.9855	7
HP1-712	0.9855	7 1/2
HP1-8	0.9855	8
HP1-9	0.9855	9
HP1-912	0.9855	9 1/2
HP1-10	0.9855	10
HP14-514	1.2355	5 1/4
HP14-534	1.2355	5 3/4
HP14-612	1.2355	6 1/2
HP14-7	1.2355	7
HP14-712	1.2355	7 1/2
HP14-8	1.2355	8
HP14-812	1.2355	8 1/2
HP14-9	1.2355	9
HP14-912	1.2355	9 1/2
HP14-10	1.2355	10
HP14-11	1.2355	11
HP14-12	1.2355	12

Product Code	D	L
HP12-534	1.4855	5 3/4
HP12-6	1.4855	6
HP12-612	1.4855	6 1/2
HP12-634	1.4855	6 3/4
HP12-7	1.4855	7
HP12-712	1.4855	7 1/2
HP12-8	1.4855	8
HP12-812	1.4855	8 1/2
HP12-912	1.4855	9 1/2
HP12-10	1.4855	10
HP12-12	1.4855	12
HP134-10	1.7355	10
HP134-12	1.7355	12

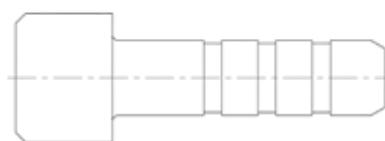
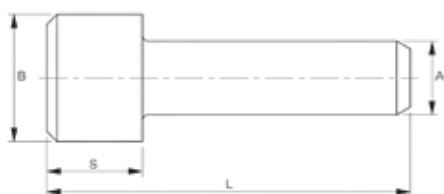


Hales Line Ream Stepped Pin

Materials: Deep core strength case hardened materials
Compatible with: HB Bush
on following pages

Note:

This style from EPH 38-175 to larger sizes



Product Code	A	B	S	L
EPH-20:80	18.68	28.63	25	82
EPH-20:100	18.68	28.63	25	100
EPH-20:125	18.68	28.63	25	125
EPH-20:175	18.68	28.63	25	175
EPH-25:100	25.03	38.15	38	100
EPH-25:125	25.03	38.15	38	125
EPH-25:150	25.03	38.15	38	150
EPH-25:175	25.03	38.15	38	175
EPH-25:200	25.03	38.15	38	200
EPH-32:100	31.38	44.5	45	100
EPH-32:125	31.38	44.5	45	125
EPH-32:150	31.38	44.5	45	150
EPH-32:175	31.38	44.5	45	175
EPH-32:200	31.38	44.5	45	200
EPH-32:215	31.38	44.5	45	215
EPH-32:225	31.38	44.5	45	225
EPH-38:175	37.73	50.85	50	175
EPH-38:200	37.73	50.85	50	200
EPH-38:225	37.73	50.85	50	225
EPH-38:250	37.73	50.85	50	250
EPH-45:225	44.09	63.55	63	225
EPH-45:250	44.09	63.55	63	250
EPH-45:280	44.09	63.55	63	280
EPH-45:305	44.09	63.55	63	305



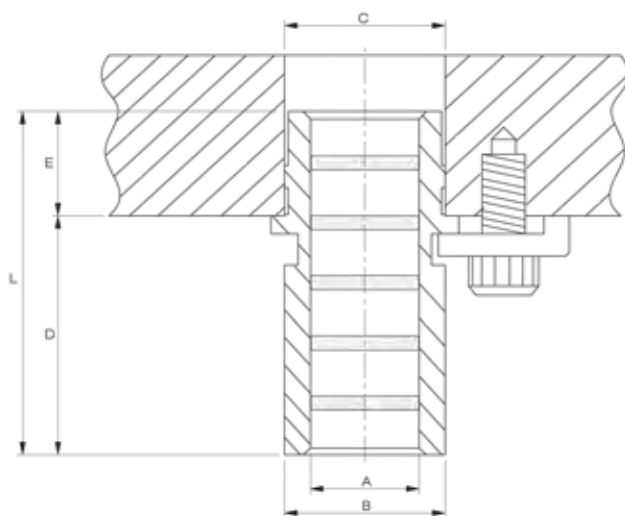
Hales Standard Die Set Oil-less Demountable Guide Bushes

Hales self lubricating die components offer industry standard, maintenance free performance resulting in overall cost savings and operational safety

These bushes are standard components in all Hales die sets.

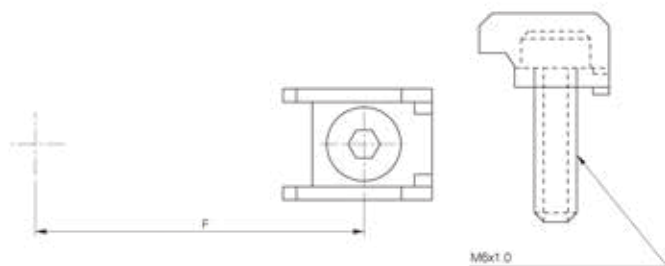
3 x Toe Clamps included

Materials: Deep core strength case hardened material with solid lubricant.



Tolerance	
A =	+0.008
	- 0
C =	+0.000
	- 0.013

Product Code	A	B	C	D	E	L	F
HRB 2532	25.037	44.45	38.1	31.75	22.25	54	27.4
HRB 2560	25.037	44.45	38.1	57.15	22.25	79.4	27.4
HRB 3238	31.387	53.97	44.45	38.1	28.58	66.7	32.1
HRB 3261	31.387	53.97	44.45	60.33	28.58	88.9	32.1
HRB 3838	37.737	60	50.8	38.1	34.93	73	35.3
HRB 3870	37.737	60	50.8	69.85	34.93	104.8	35.3
HRB 3890	37.737	60	50.8	88.9	34.93	123.8	35.3
HRB 4576	44.087	66.68	57.15	76.18	41.30	117.5	38.5



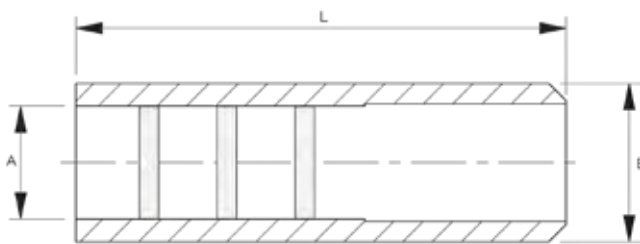
Product Code	Description
HRBTC	Toe Clamp



Hales Oil-less Press Fit Bush

Hales self lubricating die components offer industry standard, maintenance free performance resulting in overall cost savings and operational safety.

Materials: High carbon chrome bearing steel with solid lubricant



Tolerance	
A =	+0.0003
	- 0
B =	+0.0003
	- 0

Product Code	A	B	L
HB034-218	0.7356	1.1271	2 1/8
HB034-258	0.7356	1.1271	2 5/8
HB1-3	0.9856	1.5021	3
HB1-312	0.9856	1.5021	3 1/2
HB14-3	1.2356	1.7521	3
HB14-312	1.2356	1.7521	3 1/2
HB14-438	1.2356	1.7521	4 3/8
HB12-312	1.4856	2.0021	3 1/2
HB12-438	1.4856	2.0021	4 3/8
HB12-514	1.4856	2.0021	5 1/4
HB134-412	1.7356	2.5021	4 1/2
HB134-514	1.7356	2.5021	5 1/4



Hales Bolt on Ball Bearing Pin and Bush Assemblies

Helical design of cage and plunger allows cage to freely rotate over the entire peripheral surface. Perfect precision alignment. When assembling, two dowel pins are to be fitted in guide bush and holder.

Please note: Dowels and screws are included in assembly.

Materials:

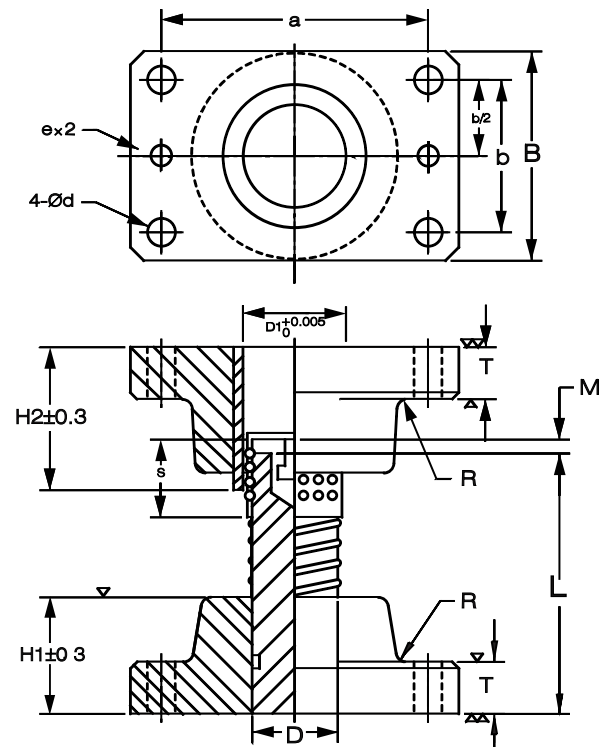
Guide post - Deep core strength case hardened materials

Holder - Automotive high alloyed iron

Guide bush - Automotive high alloyed iron with solid lubricant.

M: Movable range of stopper

Please note: 60 Dia has fixed stopper



Product Code	ØD	L	D1	A	B	a	b	d	H1	H2	T	S	M	e=H7	H7	screw 8pcs	dowel 4pcs
PSRBB25-120	25	120	31	84	48	66	30	9	30	50	20	50	0 - 20	8	+0.015 0	M8 x 35	8x30
PSRBB25-140		140															
PSRBB25-160		160															
PSRBB25-180		180															
PSRBB32-120	32	120	40	100	58	76	36	11	40	60	20	60	0 - 25	8	+0.015 0	M10 x 40	8x30
PSRBB32-140		140															
PSRBB32-160		160															
PSRBB32-180		180															
PSRBB38-160	38	160	48	130	75	100	44	11	50	70	25	70	0 - 29	10	+0.015 0	M10 x 45	10x40
PSRBB38-180		180															
PSRBB38-200		200															
PSRBB38-240		240															
PSRBB50-180	50	180	60	155	90	125	60	14	65	90	25	90	0 - 42	10	+0.015 0	M12 x 50	10x40
PSRBB50-200		200															
PSRBB50-240		240															
PSRBB50-260		260															
PSRBB50-300	60	300	70	190	120	150	80	18	75	100	30	100	0 - 59	13	+0.018 0	M16 x 60	13x50
PSRBB60-200		200															
PSRBB60-240		240															
PSRBB60-260		260															
PSRBB60-300		300															



Hales Oil-less Bolt on Pin and Bush Assemblies

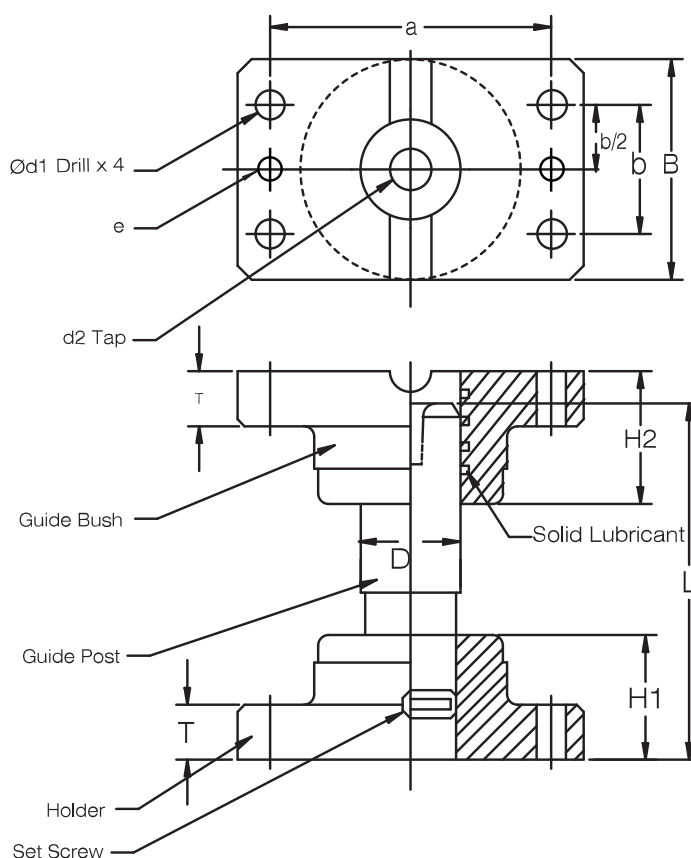
When assembling, two dowel pins are to be fitted in guide bush and holder.
Please note: Dowels and screws are included in assembly.

Materials:

Guide post - Deep core strength case hardened materials.

Holder - Automotive high alloyed iron

Guide bush - Automotive high alloyed iron with solid lubricant.



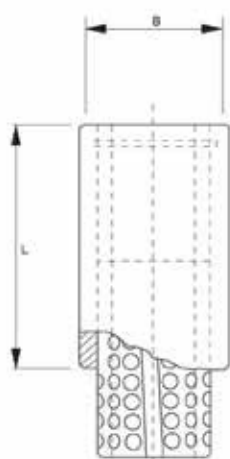
Product Code	ØD	L	A	B	H1	H2	a	b	T	Ød1	e=H7	H7	screw 8pcs	dowel 4pcs
PSGR25-100	25	100	84	48	30	45	66	30	20	9	8.0	+0.015 0	M8x35	8x30
PSGR25-120		120												
PSGR32-120	32	120	100	58	40	50	76	36	20	11	8.0	+0.015 0	M10x40	8x30
PSGR32-140		140												
PSGR32-160		160												
PSGR38-120	38	120	130	75	50	60	100	44	25	11	10.0	+0.015 0	M10x45	10x40
PSGR38-140		140												
PSGR38-160		160												
PSGR38-180		180												
PSGR50-160	50	160	155	90	65	85	125	60	25	14	10.0	+0.015 0	M12x50	10x40
PSGR50-200		200												
PSGR50-250		250												
PSGR50-300		300												
PSGR60-200	60	200	190	120	75	100	150	80	30	18	13.0	+0.018 0	M16x60	13x50
PSGR60-250		250												
PSGR60-300		300												



The EBB Bush and Cage is designed to be fitted inside the top bolster as the ball cage is captive inside the bush.

The advantage of this design is that it eliminates any foreign bodies entering the sensitive ball cage area causing damage.

Product Code	B	L
EBB1x3.43	1.9855	3.43
EBB1x4.43	1.9855	4.43
EBB1.25x3.93	2.235	3.93
EBB1.25x4.93	2.235	4.93
EBB1.5x4.18	2.485	4.18
EBB1.5x5.18	2.485	5.18
EBB1.75x4.43	2.985	4.43
EBB1.75x5.43	2.985	5.43
EBB2x5	3.235	5
EBB2x6	3.235	6



Product Code	A	L
EBP1x4.5	0.9855	4.5
EBP1x5.25	0.9855	5.25
EBP1x5.75	0.9855	5.75
EBP1x6.5	0.9855	6.5
EBP1x7	0.9855	7
EBP1x7.5	0.9855	7.5
EBP1x8	0.9855	8
EBP1x8.5	0.9855	8.5
EBP1x9	0.9855	9
EBP1x10	0.9855	10
EBP1.25x5.25	1.2355	5.25
EBP1.25x5.75	1.2355	5.75
EBP1.25x6.5	1.2355	6.5
EBP1.25x7	1.2355	7
EBP1.25x7.5	1.2355	7.5
EBP1.25x8	1.2355	8
EBP1.25x8.5	1.2355	8.5
EBP1.25x10.00	1.2355	10
EBP1.5x6	1.4855	6
EBP1.5x6.75	1.4855	6.75
EBP1.5x7.5	1.4855	7.5
EBP1.5x8.5	1.4855	8.5
EBP1.5x10	1.4855	10
EBP1.5x11	1.4855	11
EBP1.5x12	1.4855	12
EBP1.75x7.5	1.7355	7.5
EBP1.75x8.5	1.7355	8.5
EBP1.75x9.5	1.7355	9.5
EBP1.75x10	1.7355	10
EBP1.75x11	1.7355	11
EBP1.75x12	1.7355	12
EBP2x7.5	1.9855	7.5
EBP2x8.5	1.9855	8.5
EBP2x9.5	1.9855	9.5
EBP2x10	1.9855	10
EBP2x11	1.9855	11
EBP2x12	1.9855	12

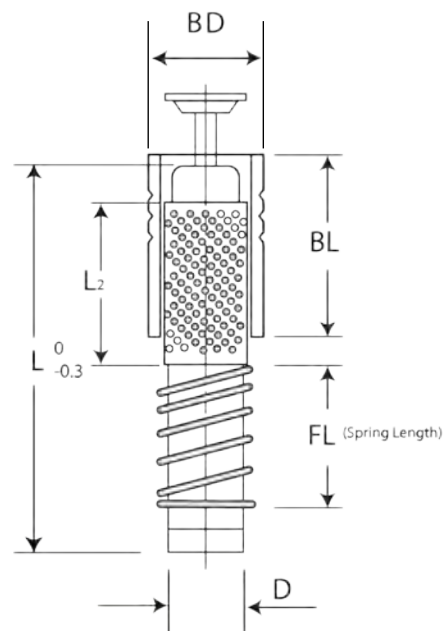


Ball Bearing Pins and Bushes offer distinct advantages:

- The difficulty of assembly and disassembly of die sets is eliminated
- Lubrication problems are almost entirely eliminated
- Perfect alignment reduces wear and increases die life

Ordering Example

Code No.	L	BL	FL
PPS22	120	L50	40
PPS22	-12	-L5	-4
Ordering Code = PPS22-12-L5-4			



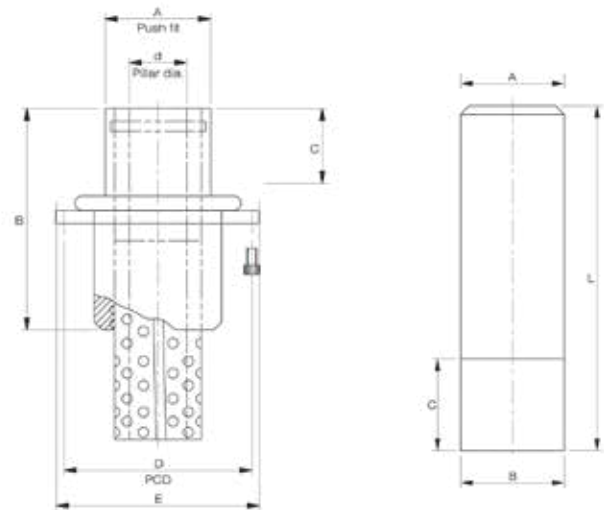
FULL RANGE																			
Code	D	L														BL	FL	L2	BD
PPS	20	100	110	120	130	140	150	160	170	180						L50	40-140	50	37
	22			120	130	140	150	160	170	180						L50	40-140	50	40
																L60		60	40
	25			120	130	140	150	160	170	180					L60	40-150	60	45	
															L80		75	45	
	28					140	150	160	170	180	190	200				L60	50-150	60	50
																L80		75	50
	32							160	170	180	190	200	220	240		L80	70-190	75	55
																L100		90	55
	38									180	190	200	220	240	260	L80	80-190	75	64
																L100		90	64
	45									180	190	200	220	240	260	L100	80-190	90	74
																L120		110	74
	50											200	220	240	260	L100	80-190	90	83
																L120		110	83

STOCKED SIZES	
Product Code	Description
PPS25-16-L8-15	25 X 160 Ball Bearing Assembly
PPS25-18-L8-15	25 X 180 Ball Bearing Assembly
PPS32-18-L10-19	32 X 180 Ball Bearing Assembly
PPS32-20-L10-19	32 X 200 Ball Bearing Assembly
PPS38-20-L10-19	38 X 200 Ball Bearing Assembly
PPS38-24-L10-19	38 X 240 Ball Bearing Assembly



Preloaded for high precision applications.

- Captive ball cage.
- Recommended for high-speed operations.
- Flanged mounting
- Spiro-helical ball pattern for extended life.



Product Code	d	A	B	C	D	E
EXBB 0.750	0.75	1.125	2.937	0.937	2	2.375
EXBB 1.00	1	1.5	3.437	1.218	2.312	2.687
EXBB 1.25-S	1.25	1.75	3.937	1.218	2.656	3
EXBB 1.250	1.25	1.75	3.937	1.687	2.656	3
EXBB 1.500	1.5	2	4.187	1.875	2.968	3.437

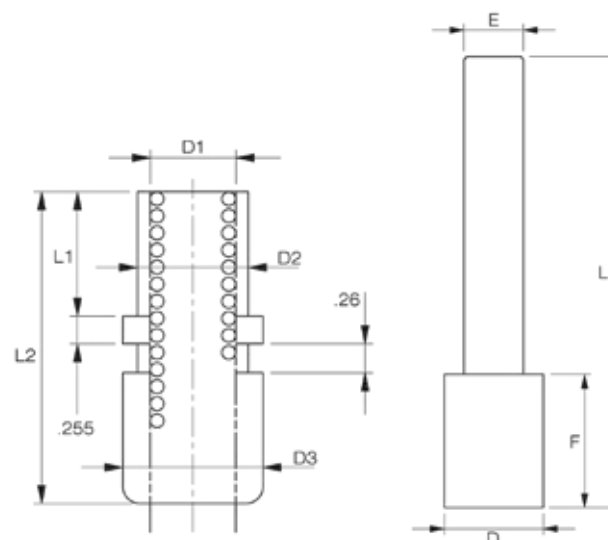
Product Code	A	B	C	L
EXP0.75 X 5.5	0.75	0.7355	1.25	5.5
EXP1 X 6	1	0.9855	1.5	6
EXP1 X 6.5	1	0.9855	1.5	6.5
EXP1 X 7.5	1	0.9855	1.5	7.5
EXP1.25 X 6	1.25	1.2355	2	6
EXP1.25 X 6.5	1.25	1.2355	2	6.5
EXP1.25 X 7.5	1.25	1.2355	2	7.5
EXP1.25 X 8.5	1.25	1.2355	2	8.5
EXP1.50 X 7.5	1.5	1.4855	2	7.5
EXP1.50 X 8.5	1.5	1.4855	2	8.5
EXP1.50 X 9.5	1.5	1.4855	2	9.5



Ball cage is designed to circulate around pin and bush, giving even wear and longer life.

3 x Toe Clamps included

A1 Series can be fitted into Hales standard die set without any modification.



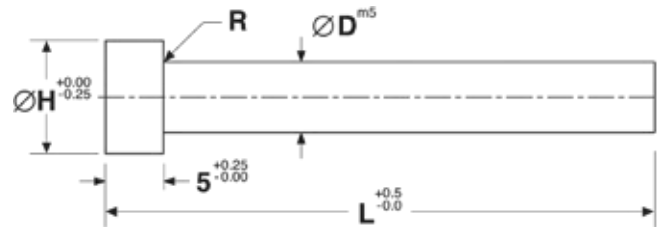
Product Code	D (+.0000-.0002)	E	F	L
A1-1x4.5	0.9855	0.9	1.25	4.5
A1-1x5.75	0.9855	0.9	1.25	5.75
A1-1x7	0.9855	0.9	1.25	7
A1-1x7.5	0.9855	0.9	1.25	7.5
A1-1x8	0.9855	0.9	1.25	8
A1-1.25X5.75	1.2355	1.15	1.5	5.75
A1-1.25X6.5	1.2355	1.15	1.5	6.5
A1-1.25X7	1.2355	1.15	1.5	7
A1-1.25X7.5	1.2355	1.15	1.5	7.5
A1-1.25X8	1.2355	1.15	1.5	8
A1-1.25X8.5	1.2355	1.15	1.5	8.5
A1-1.5X6	1.4855	1.4	1.5	6
A1-1.5X6.5	1.4855	1.4	1.5	6.5
A1-1.5X7	1.4855	1.4	1.5	7
A1-1.5X7.5	1.4855	1.4	1.5	7.5
A1-1.5X8	1.4855	1.4	1.5	8
A1-1.5X8.5	1.4855	1.4	1.5	8.5
A1-1.5X9.5	1.4855	1.4	1.5	9.5

Product Code	Description	D1	D2		D3	L1	L2
			Hole +0 +.0010	Bush +.0002 +0			
A1-1BUSH	A1 Series 1Bush/Retainer	1.274	1.500		1.875	1.218	3.437
A1-1.25 BUSH	A1 Series 1 1/4Bush/Retain	1.524	1.750		2.125	1.218	3.937
A1-1.5 BUSH	A1 Series 1 1/2 Bush/Retain	1.774	2.000		2.375	1.437	4.187



Materials: M2, 64 +/- 2 Hrc Triple Tempered (HSS)

Head Hardness: 50 +/- 5 Hrc.

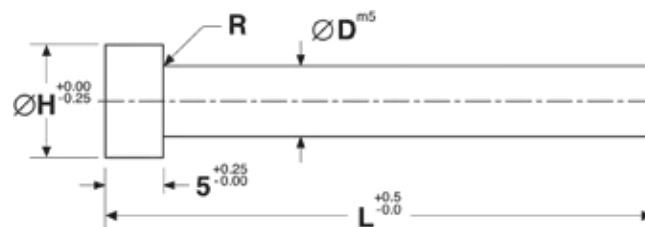


D	H	HSS - Metric				
		72	100	120	150	160
2	5		HGPSB-02100-M2			
2.5	5.5		HGPSB-025100-M2			
3	6	HGPSB-03072-M2	HGPSB-03100-M2			
3.5	6.5		HGPSB-035100-M2			
4	7	HGPSB-04072-M2	HGPSB-04100-M2			
4.5	7.5		HGPSB-045100-M2			
5	8	HGPSB-05072-M2	HGPSB-05100-M2			
5.5	8.5		HGPSB-055100-M2			
6	9	HGPSB-06072-M2	HGPSB-06100-M2	HGPSB-06120-M2		
6.5	9.5		HGPSB-065100-M2			
7	10	HGPSB-07072-M2	HGPSB-07100-M2			
7.5	10.5		HGPSB-075100-M2			
8	11	HGPSB-08072-M2	HGPSB-08100-M2	HGPSB-08120-M2	HGPSB-08150-M2	HGPSB-08160-M2
9	12	HGPSB-09072-M2	HGPSB-09100-M2	HGPSB-09120-M2		
10	13	HGPSB-10072-M2	HGPSB-10100-M2	HGPSB-10120-M2		HGPSB-10160-M2
11	14	HGPSB-11072-M2	HGPSB-11100-M2			
12	15	HGPSB-12072-M2	HGPSB-12100-M2	HGPSB-12120-M2		HGPSB-12160-M2
13	16	HGPSB-13072-M2	HGPSB-13100-M2	HGPSB-13120-M2	HGPSB-13150-M2	HGPSB-13160-M2
14	17	HGPSB-14072-M2	HGPSB-14100-M2			
16	19	HGPSB-16072-M2	HGPSB-16100-M2	HGPSB-16120-M2		HGPSB-16160-M2
20	23	HGPSB-20072-M2	HGPSB-20100-M2	HGPSB-20120-M2		HGPSB-20160-M2
25	28	HGPSB-25072-M2	HGPSB-25100-M2	HGPSB-25120-M2		
32	35		HGPSB-32100-M2			

D	H (mm)	HSS - Imperial			
		72	100	120	130
1/8	5	HGPSBI-18-072-M2	HGPSBI-18-100-M2		
5/32	6	HGPSBI-532-072-M2	HGPSBI-532-100-M2		
3/16	8	HGPSBI-316-072-M2	HGPSBI-316-100-M2		
1/4	9	HGPSBI-14-072-M2	HGPSBI-14-100-M2		
5/16	11	HGPSBI-516-072-M2	HGPSBI-516-100-M2		
3/8	13	HGPSBI-38-072-M2	HGPSBI-38-100-M2	HGPSBI-38-120-M2	
1/2	16	HGPSBI-12-072-M2	HGPSBI-12-100-M2		HGPSBI-12-130-M2
5/8	19		HGPSBI-58-100-M2		
3/4	22		HGPSBI-34-100-M2		



Materials: Tool Steel, 62 +/- 2 Hrc Triple Tempered (A2)
Head Hardness: 40 +/- 5 Hrc.

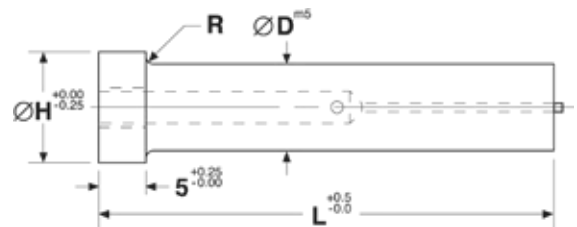


D	H	A2 - Metric		
		72	100	120
3	6	HGPSB-03072-A2	HGPSB-03100-A2	
4	7	HGPSB-04072-A2	HGPSB-04100-A2	
5	8	HGPSB-05072-A2	HGPSB-05100-A2	
6	9	HGPSB-06072-A2	HGPSB-06100-A2	
7	10	HGPSB-07072-A2	HGPSB-07100-A2	
8	11	HGPSB-08072-A2	HGPSB-08100-A2	HGPSB-08120-A2
9	12	HGPSB-09072-A2	HGPSB-09100-A2	
10	13	HGPSB-10072-A2	HGPSB-10100-A2	HGPSB-10120-A2
11	14	HGPSB-11072-A2	HGPSB-11100-A2	
12	15	HGPSB-12072-A2	HGPSB-12100-A2	HGPSB-12120-A2
13	16	HGPSB-13072-A2	HGPSB-13100-A2	HGPSB-13120-A2
14	17	HGPSB-14072-A2	HGPSB-14100-A2	
16	19	HGPSB-16072-A2	HGPSB-16100-A2	HGPSB-16120-A2
20	23	HGPSB-20072-A2	HGPSB-20100-A2	HGPSB-20120-A2
25	28	HGPSB-25072-A2	HGPSB-25100-A2	
32	35		HGPSB-32100-A2	

D	H (mm)	A2 - Imperial	
		72	100
1/8	5	HGPSBI-18-072-A2	
5/32	6	HGPSBI-532-072-A2	HGPSBI-532-100-A2
3/16	8		HGPSBI-316-100-A2
1/4	9		HGPSBI-14-100-A2
3/8	13	HGPSBI-38-072-A2	
5/8	19		HGPSBI-58-100-A2
3/4	22		HGPSBI-34-100-A2



Materials: M2, 64 +/- 2 Hrc Triple Tempered (HSS)
Head Hardness: 50 +/- 5 Hrc.



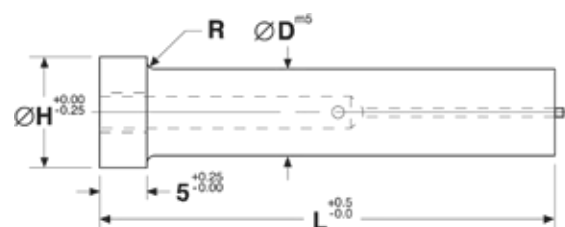
D	H	HSS - Metric			
		56	63	71	80
5	8	HGESB-05056-M2	HGESB-05063-M2	HGESB-05071-M2	HGESB-05080-M2
6	9	HGESB-06056-M2	HGESB-06063-M2	HGESB-06071-M2	HGESB-06080-M2
8	11	HGESB-08056-M2	HGESB-08063-M2	HGESB-08071-M2	HGESB-08080-M2
10	13	HGESB-10056-M2	HGESB-10063-M2	HGESB-10071-M2	HGESB-10080-M2
12	15	HGESB-12056-M2	HGESB-12063-M2	HGESB-12071-M2	HGESB-12080-M2
13	16	HGESB-13056-M2	HGESB-13063-M2	HGESB-13071-M2	HGESB-13080-M2
14	17	HGESB-14056-M2	HGESB-14063-M2	HGESB-14071-M2	HGESB-14080-M2
16	19	HGESB-16056-M2	HGESB-16063-M2	HGESB-16071-M2	HGESB-16080-M2
20	23	HGESB-20056-M2	HGESB-20063-M2	HGESB-20071-M2	HGESB-20080-M2
25	28			HGESB-25071-M2	HGESB-25080-M2
32	35				HGESB-32080-M2

D	H	HSS - Metric		
		90	100	120
5	8	HGESB-05090-M2	HGESB-05100-M2	
6	9	HGESB-06090-M2	HGESB-06100-M2	
7	10		HGESB-07100-M2	
8	11	HGESB-08090-M2	HGESB-08100-M2	
10	13	HGESB-10090-M2	HGESB-10100-M2	
12	15	HGESB-12090-M2	HGESB-12100-M2	HGESB-12120-M2
13	16	HGESB-13090-M2	HGESB-13100-M2	
14	17	HGESB-14090-M2	HGESB-14100-M2	
16	19	HGESB-16090-M2	HGESB-16100-M2	HGESB-16120-M2
20	23	HGESB-20090-M2	HGESB-20100-M2	
25	28		HGESB-25100-M2	
32	35		HGESB-32100-M2	

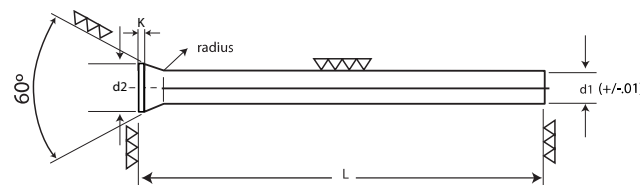


Materials: Tool Steel, 62 +/- 2 Hrc Triple Tempered (A2)

Head Hardness: 40 +/- 5 Hrc.



D	H	A2 - Metric					
		56	63	71	80	90	100
5	8	HGESB-05056-A2	HGESB-05063-A2	HGESB-05071-A2	HGESB-05080-A2	HGESB-05090-A2	HGESB-05100-A2
6	9	HGESB-06056-A2	HGESB-06063-A2	HGESB-06071-A2	HGESB-06080-A2	HGESB-06090-A2	HGESB-06100-A2
8	11	HGESB-08056-A2	HGESB-08063-A2	HGESB-08071-A2	HGESB-08080-A2	HGESB-08090-A2	HGESB-08100-A2
10	13	HGESB-10056-A2	HGESB-10063-A2	HGESB-10071-A2	HGESB-10080-A2	HGESB-10090-A2	HGESB-10100-A2
12	15	HGESB-12056-A2	HGESB-12063-A2	HGESB-12071-A2	HGESB-12080-A2	HGESB-12090-A2	HGESB-12100-A2
13	16	HGESB-13056-A2	HGESB-13063-A2	HGESB-13071-A2	HGESB-13080-A2	HGESB-13090-A2	HGESB-13100-A2
16	19	HGESB-16056-A2	HGESB-16063-A2	HGESB-16071-A2	HGESB-16080-A2	HGESB-16090-A2	HGESB-16100-A2
20	23	HGESB-20056-A2	HGESB-20063-A2	HGESB-20071-A2	HGESB-20080-A2	HGESB-20090-A2	HGESB-20100-A2

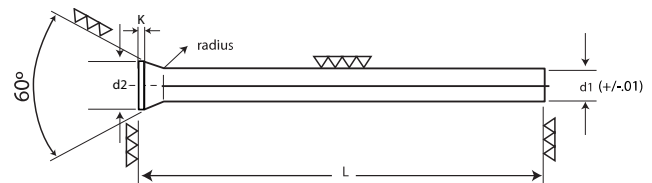


Materials: (HSS) M2, Tungsten High Speed Steel
Shank Hardness: 64 +/- 2 Hrc
Head Hardness: 50 +/- 5 Hrc.

DIA d1	d2 +/- 0.1	K +0.2 R-3	HSS		
			70	80	100
0.50	0.9	0.2	DF-0050-070-M2		
0.55	1.0	0.2	DF-0055-070-M2		
0.60	1.1	0.2	DF-0060-070-M2		
0.65	1.2	0.2	DF-0065-070-M2		
0.70	1.3	0.2	DF-0070-070-M2		
0.75	1.3	0.2	DF-0075-070-M2		
0.80	1.4	0.4	DF-0080-070-M2		
0.85	1.4	0.4	DF-0085-070-M2		
0.90	1.6	0.4	DF-0090-070-M2		
0.95	1.6	0.4	DF-0095-070-M2		
1.00	1.8	0.5	DF-0100-070-M2	DF-0100-080-M2	DF-0100-100-M2
1.05	1.8	0.5	DF-0105-070-M2		
1.10	1.8	0.5	DF-0110-070-M2	DF-0110-080-M2	DF-0110-100-M2
1.15	2.0	0.5	DF-0115-070-M2		
1.20	2.0	0.5	DF-0120-070-M2	DF-0120-080-M2	DF-0120-100-M2
1.25	2.0	0.5	DF-0125-070-M2	DF-0125-080-M2	DF-0125-100-M2
1.30	2.0	0.5	DF-0130-070-M2	DF-0130-080-M2	DF-0130-100-M2
1.35	2.2	0.5	DF-0135-070-M2		
1.40	2.2	0.5	DF-0140-070-M2	DF-0140-080-M2	DF-0140-100-M2
1.45	2.2	0.5	DF-0145-070-M2		
1.50	2.2	0.5	DF-0150-070-M2	DF-0150-080-M2	DF-0150-100-M2
1.55	2.5	0.5	DF-0155-070-M2		
1.60	2.5	0.5	DF-0160-070-M2	DF-0160-080-M2	DF-0160-100-M2
1.65	2.5	0.5	DF-0165-070-M2		
1.70	2.5	0.5	DF-0170-070-M2	DF-0170-080-M2	DF-0170-100-M2
1.75	2.8	0.5	DF-0175-070-M2	DF-0175-080-M2	DF-0175-100-M2
1.80	2.8	0.5	DF-0180-070-M2	DF-0180-080-M2	DF-0180-100-M2
1.85	2.8	0.5	DF-0185-070-M2		
1.90	2.8	0.5	DF-0190-070-M2	DF-0190-080-M2	DF-0190-100-M2
1.95	3.0	0.5	DF-0195-070-M2		
2.00	3.0	0.5	DF-0200-070-M2	DF-0200-080-M2	DF-0200-100-M2
2.05	3.2	0.5	DF-0205-070-M2		
2.10	3.2	0.5	DF-0210-070-M2	DF-0210-080-M2	DF-0210-100-M2
2.15	3.2	0.5	DF-0215-070-M2		
2.20	3.2	0.5	DF-0220-070-M2	DF-0220-080-M2	DF-0220-100-M2
2.25	3.5	0.5	DF-0225-070-M2	DF-0225-080-M2	DF-0225-100-M2
2.30	3.5	0.5	DF-0230-070-M2	DF-0230-080-M2	DF-0230-100-M2
2.35	3.5	0.5	DF-0235-070-M2		
2.40	3.5	0.5	DF-0240-070-M2	DF-0240-080-M2	DF-0240-100-M2
2.45	3.5	0.5	DF-0245-070-M2		
2.50	3.5	0.5	DF-0250-070-M2	DF-0250-080-M2	DF-0250-100-M2
2.55	4.0	0.5	DF-0255-070-M2		
2.60	4.0	0.5	DF-0260-070-M2	DF-0260-080-M2	DF-0260-100-M2
2.65	4.0	0.5	DF-0265-070-M2		
2.70	4.0	0.5	DF-0270-070-M2	DF-0270-080-M2	DF-0270-100-M2
2.75	4.0	0.5	DF-0275-070-M2	DF-0275-080-M2	DF-0275-100-M2
2.80	4.0	0.5	DF-0280-070-M2	DF-0280-080-M2	DF-0280-100-M2
2.85	4.0	0.5	DF-0285-070-M2		
2.90	4.0	0.5	DF-0290-070-M2	DF-0290-080-M2	DF-0290-100-M2
2.95	4.0	0.5	DF-0295-070-M2		
3.00	4.5	0.5	DF-0300-070-M2	DF-0300-080-M2	DF-0300-100-M2
3.05	4.5	0.5	DF-0305-070-M2		

Materials: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc
Head Hardness: 40 +/- 5 Hrc.

DIA d1	d2 +/- 0.1	K +0.2 R-3	A2		
			70	80	100
0.55	1.0	0.2	DF-0055-070-A2		
0.60	1.1	0.2	DF-0060-070-A2		
0.65	1.2	0.2	DF-0065-070-A2		
0.70	1.3	0.2	DF-0070-070-A2		
0.75	1.3	0.2	DF-0075-070-A2		
0.80	1.4	0.4	DF-0080-070-A2		
0.85	1.4	0.4	DF-0085-070-A2		
0.90	1.6	0.4	DF-0090-070-A2		
0.95	1.6	0.4	DF-0095-070-A2		
1.00	1.8	0.5	DF-0100-070-A2	DF-0100-080-A2	DF-0100-100-A2
1.05	1.8	0.5	DF-0105-070-A2		
1.10	1.8	0.5	DF-0110-070-A2	DF-0110-080-A2	DF-0110-100-A2
1.15	2.0	0.5	DF-0115-070-A2		
1.20	2.0	0.5	DF-0120-070-A2	DF-0120-080-A2	DF-0120-100-A2
1.25	2.0	0.5	DF-0125-070-A2	DF-0125-080-A2	DF-0125-100-A2
1.30	2.0	0.5	DF-0130-070-A2	DF-0130-080-A2	DF-0130-100-A2
1.35	2.2	0.5	DF-0135-070-A2		
1.40	2.2	0.5	DF-0140-070-A2	DF-0140-080-A2	DF-0140-100-A2
1.45	2.2	0.5	DF-0145-070-A2		
1.50	2.2	0.5	DF-0150-070-A2	DF-0150-080-A2	DF-0150-100-A2
1.55	2.5	0.5	DF-0155-070-A2		
1.60	2.5	0.5	DF-0160-070-A2	DF-0160-080-A2	DF-0160-100-A2
1.65	2.5	0.5	DF-0165-070-A2	DF-0165-080-A2	
1.70	2.5	0.5	DF-0170-070-A2	DF-0170-080-A2	DF-0170-100-A2
1.75	2.8	0.5	DF-0175-070-A2	DF-0175-080-A2	DF-0175-100-A2
1.80	2.8	0.5	DF-0180-070-A2	DF-0180-080-A2	DF-0180-100-A2
1.85	2.8	0.5	DF-0185-070-A2		
1.90	2.8	0.5	DF-0190-070-A2	DF-0190-080-A2	DF-0190-100-A2
1.95	3.0	0.5	DF-0195-070-A2		
2.00	3.0	0.5	DF-0200-070-A2	DF-0200-080-A2	DF-0200-100-A2
2.05	3.2	0.5	DF-0205-070-A2		
2.10	3.2	0.5	DF-0210-070-A2	DF-0210-080-A2	DF-0210-100-A2
2.15	3.2	0.5	DF-0215-070-A2		
2.20	3.2	0.5	DF-0220-070-A2	DF-0220-080-A2	
2.25	3.5	0.5	DF-0225-070-A2	DF-0225-080-A2	DF-0225-100-A2
2.30	3.5	0.5	DF-0230-070-A2	DF-0230-080-A2	DF-0230-100-A2
2.35	3.5	0.5	DF-0235-070-A2		
2.40	3.5	0.5	DF-0240-070-A2	DF-0240-080-A2	DF-0240-100-A2
2.45	3.5	0.5	DF-0245-070-A2		
2.50	3.5	0.5	DF-0250-070-A2	DF-0250-080-A2	DF-0250-100-A2
2.55	4.0	0.5	DF-0255-070-A2		
2.60	4.0	0.5	DF-0260-070-A2	DF-0260-080-A2	DF-0260-100-A2
2.65	4.0	0.5	DF-0265-070-A2		
2.70	4.0	0.5	DF-0270-070-A2	DF-0270-080-A2	DF-0270-100-A2
2.75	4.0	0.5	DF-0275-070-A2	DF-0275-080-A2	DF-0275-100-A2
2.80	4.0	0.5	DF-0280-070-A2	DF-0280-080-A2	DF-0280-100-A2
2.85	4.0	0.5	DF-0285-070-A2		
2.90	4.0	0.5	DF-0290-070-A2	DF-0290-080-A2	DF-0290-100-A2
2.95	4.0	0.5	DF-0295-070-A2		
3.00	4.5	0.5	DF-0300-070-A2	DF-0300-080-A2	DF-0300-100-A2

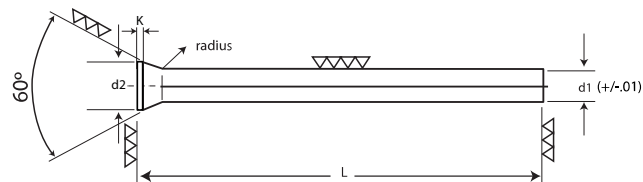


Materials: (HSS) M2, Tungsten High Speed Steel
Shank Hardness: 64 +/- 2 Hrc
Head Hardness: 50 +/- 5 Hrc.

Materials: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc
Head Hardness: 40 +/- 5 Hrc.

DIA d1	d2 +/- 0.1	K +0.2 R-3	HSS		
			70	80	100
3.10	4.5	0.5	DF-0310-070-M2	DF-0310-080-M2	DF-0310-100-M2
3.15	4.5	0.5	DF-0315-070-M2		
3.20	4.5	0.5	DF-0320-070-M2	DF-0320-080-M2	DF-0320-100-M2
3.25	4.5	0.5	DF-0325-070-M2	DF-0325-080-M2	DF-0325-100-M2
3.30	4.5	0.5	DF-0330-070-M2	DF-0330-080-M2	DF-0330-100-M2
3.35	4.5	0.5	DF-0335-070-M2		
3.40	4.5	0.5	DF-0340-070-M2	DF-0340-080-M2	DF-0340-100-M2
3.45	4.5	0.5	DF-0345-070-M2		
3.50	5.0	0.5	DF-0350-070-M2	DF-0350-080-M2	DF-0350-100-M2
3.55	5.0	0.5	DF-0355-070-M2		
3.60	5.0	0.5	DF-0360-070-M2	DF-0360-080-M2	DF-0360-100-M2
3.65	5.0	0.5	DF-0365-070-M2	DF-0365-080-M2	
3.70	5.0	0.5	DF-0370-070-M2	DF-0370-080-M2	DF-0370-100-M2
3.75	5.0	0.5	DF-0375-070-M2	DF-0375-080-M2	DF-0375-100-M2
3.80	5.0	0.5	DF-0380-070-M2	DF-0380-080-M2	DF-0380-100-M2
3.85	5.0	0.5	DF-0385-070-M2		
3.90	5.0	0.5	DF-0390-070-M2	DF-0380-080-M2	DF-0390-100-M2
3.95	5.0	0.5	DF-0395-070-M2	DF-0395-080-M2	
4.00	5.5	0.5	DF-0400-070-M2	DF-0400-080-M2	DF-0400-100-M2
4.05	5.5	0.5	DF-0405-070-M2		
4.10	5.5	0.5	DF-0410-070-M2	DF-0410-080-M2	DF-0410-100-M2
4.15	5.5	0.5	DF-0415-070-M2		
4.20	5.5	0.5	DF-0420-070-M2	DF-0420-080-M2	DF-0420-100-M2
4.25	5.5	0.5	DF-0425-070-M2	DF-0425-080-M2	DF-0425-100-M2
4.30	5.5	0.5	DF-0430-070-M2	DF-0430-080-M2	DF-0430-100-M2
4.35	5.5	0.5	DF-0435-070-M2		
4.40	5.5	0.5	DF-0440-070-M2	DF-0440-080-M2	DF-0440-100-M2
4.45	5.5	0.5	DF-0445-070-M2		
4.50	6.0	0.5	DF-0450-070-M2	DF-0450-080-M2	DF-0450-100-M2
4.55	6.0	0.5	DF-0455-070-M2		
4.60	6.0	0.5	DF-0460-070-M2	DF-0460-080-M2	DF-0460-100-M2
4.65	6.0	0.5	DF-0465-070-M2		
4.70	6.0	0.5	DF-0470-070-M2	DF-0470-080-M2	DF-0470-100-M2
4.75	6.0	0.5	DF-0475-070-M2	DF-0475-080-M2	DF-0475-100-M2
4.80	6.0	0.5	DF-0480-070-M2	DF-0480-080-M2	DF-0480-100-M2
4.85	6.0	0.5	DF-0485-070-M2		
4.90	6.0	0.5	DF-0490-070-M2	DF-0490-080-M2	DF-0490-100-M2
4.95	6.0	0.5	DF-0495-070-M2		
5.00	6.5	0.5	DF-0500-070-M2	DF-0500-080-M2	DF-0500-100-M2
5.05	6.5	0.5	DF-0505-070-M2		
5.10	6.5	0.5	DF-0510-070-M2	DF-0510-080-M2	DF-0510-100-M2
5.15	6.5	0.5	DF-0515-070-M2		
5.20	6.5	0.5	DF-0520-070-M2	DF-0520-080-M2	DF-0520-100-M2
5.25	6.5	0.5	DF-0525-070-M2	DF-0525-080-M2	DF-0525-100-M2
5.30	6.5	0.5	DF-0530-070-M2	DF-0530-080-M2	DF-0530-100-M2
5.35	6.5	0.5	DF-0535-070-M2		
5.40	6.5	0.5	DF-0540-070-M2	DF-0540-080-M2	DF-0540-100-M2
5.45	6.5	0.5	DF-0545-070-M2		
5.50	7.0	0.5	DF-0550-070-M2	DF-0550-080-M2	DF-0550-100-M2
5.55	7.0	0.5	DF-0555-070-M2		
5.60	7.0	0.5	DF-0560-070-M2	DF-0560-080-M2	DF-0560-100-M2
5.65	7.0	0.5	DF-0565-070-M2		

DIA d1	d2 +/- 0.1	K +0.2 R-3	A2		
			70	80	100
3.10	4.5	0.5	DF-0310-070-A2	DF-0310-080-A2	DF-0310-100-A2
3.15					
3.20	4.5	0.5	DF-0320-070-A2	DF-0320-080-A2	DF-0320-100-A2
3.25	4.5	0.5	DF-0325-070-A2	DF-0325-080-A2	DF-0325-100-A2
3.30	4.5	0.5	DF-0330-070-A2	DF-0330-080-A2	DF-0330-100-A2
3.35					
3.40	4.5	0.5	DF-0340-070-A2	DF-0340-080-A2	DF-0340-100-A2
3.45					
3.50	5.0	0.5	DF-0350-070-A2	DF-0350-080-A2	DF-0350-100-A2
3.55					
3.60	5.0	0.5	DF-0360-070-A2	DF-0360-080-A2	DF-0360-100-A2
3.65	5.0	0.5	DF-0365-070-A2	DF-0365-080-A2	
3.70	5.0	0.5	DF-0370-070-A2	DF-0370-080-A2	DF-0370-100-A2
3.75	5.0	0.5	DF-0375-070-A2	DF-0375-080-A2	DF-0375-100-A2
3.80	5.0	0.5	DF-0380-070-A2	DF-0380-080-A2	DF-0380-100-A2
3.85					
3.90	5.0	0.5	DF-0390-070-A2	DF-0390-080-A2	DF-0390-100-A2
3.95	5.0	0.5	DF-0395-070-A2	DF-0395-080-A2	
4.00	5.5	0.5	DF-0400-070-A2	DF-0400-080-A2	DF-0400-100-A2
4.05					
4.10	5.5	0.5	DF-0410-070-A2	DF-0410-080-A2	DF-0410-100-A2
4.15					
4.20	5.5	0.5	DF-0420-070-A2	DF-0420-080-A2	DF-0420-100-A2
4.25	5.5	0.5	DF-0425-070-A2	DF-0425-080-A2	DF-0425-100-A2
4.30	5.5	0.5	DF-0430-070-A2	DF-0430-080-A2	DF-0430-100-A2
4.35					
4.40	5.5	0.5	DF-0440-070-A2	DF-0440-080-A2	DF-0440-100-A2
4.45					
4.50	6.0	0.5	DF-0450-070-A2	DF-0450-080-A2	DF-0450-100-A2
4.55					
4.60	6.0	0.5	DF-0460-070-A2	DF-0460-080-A2	DF-0460-100-A2
4.65					
4.70	6.0	0.5	DF-0470-070-A2	DF-0470-080-A2	DF-0470-100-A2
4.75	6.0	0.5	DF-0475-070-A2	DF-0475-080-A2	DF-0475-100-A2
4.80	6.0	0.5	DF-0480-070-A2	DF-0480-080-A2	DF-0480-100-A2
4.85					
4.90	6.0	0.5	DF-0490-070-A2	DF-0490-080-A2	DF-0490-100-A2
4.95					
5.00	6.5	0.5	DF-0500-070-A2	DF-0500-080-A2	DF-0500-100-A2
5.05					
5.10	6.5	0.5	DF-0510-070-A2	DF-0510-080-A2	DF-0510-100-A2
5.15					
5.20	6.5	0.5	DF-0520-070-A2	DF-0520-080-A2	DF-0520-100-A2
5.25	6.5	0.5	DF-0525-070-A2	DF-0525-080-A2	DF-0525-100-A2
5.30	6.5	0.5	DF-0530-070-A2	DF-0530-080-A2	DF-0530-100-A2
5.35					
5.40	6.5	0.5	DF-0540-070-A2	DF-0540-080-A2	DF-0540-100-A2
5.45					
5.50	7.0	0.5	DF-0550-070-A2	DF-0550-080-A2	DF-0550-100-A2
5.55					
5.60	7.0	0.5	DF-0560-070-A2	DF-0560-080-A2	
5.65					



Materials: (HSS) M2, Tungsten High Speed Steel

Shank Hardness: 64 +/- 2 Hrc

Head Hardness: 50 +/- 5 Hrc.

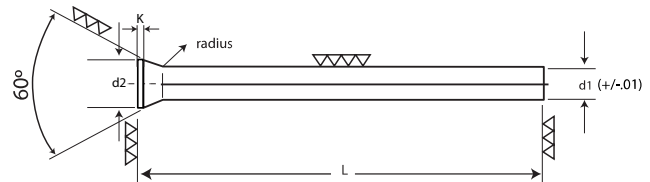
Materials: (A2) 12% Chromium Tool Steel

Shank Hardness: 62 +/- 2 Hrc

Head Hardness: 40 +/- 5 Hrc.

DIA d1	d2 +/- 0.1	K +0.2 R-3	HSS		
			70	80	100
5.70	7.0	0.5	DF-0570-070-M2	DF-0570-080-M2	DF-0570-100-M2
5.75	7.0	0.5	DF-0575-070-M2		DF-0575-100-M2
5.80	7.0	0.5	DF-0580-070-M2	DF-0580-080-M2	DF-0580-100-M2
5.85	7.0	0.5	DF-0585-070-M2		
5.90	7.0	0.5	DF-0590-070-M2	DF-0590-080-M2	DF-0590-100-M2
5.95	7.0	0.5	DF-0595-070-M2		
6.00	8.0	0.5	DF-0600-070-M2	DF-0600-080-M2	DF-0600-100-M2
6.10	8.0	0.5	DF-0610-070-M2	DF-0610-080-M2	DF-0610-100-M2
6.20	8.0	0.5	DF-0620-070-M2	DF-0620-080-M2	DF-0620-100-M2
6.25	8.0	0.5	DF-0625-070-M2	DF-0625-080-M2	DF-0625-100-M2
6.30	8.0	0.5	DF-0630-070-M2	DF-0630-080-M2	DF-0630-100-M2
6.40	8.0	0.5	DF-0640-070-M2	DF-0640-080-M2	DF-0640-100-M2
6.50	9.0	1.0	DF-0650-070-M2	DF-0650-080-M2	DF-0650-100-M2
6.60	9.0	1.0	DF-0660-070-M2	DF-0660-080-M2	DF-0660-100-M2
6.70	9.0	1.0	DF-0670-070-M2	DF-0670-080-M2	DF-0670-100-M2
6.75	9.0	1.0	DF-0675-070-M2	DF-0675-080-M2	DF-0675-100-M2
6.80	9.0	1.0	DF-0680-070-M2	DF-0680-080-M2	DF-0680-100-M2
6.90	9.0	1.0	DF-0690-070-M2	DF-0690-080-M2	DF-0690-100-M2
7.00	9.0	1.0	DF-0700-070-M2	DF-0700-080-M2	DF-0700-100-M2
7.10	9.0	1.0	DF-0710-070-M2	DF-0710-080-M2	DF-0710-100-M2
7.20	9.0	1.0	DF-0720-070-M2	DF-0720-080-M2	DF-0720-100-M2
7.25	9.0	1.0	DF-0725-070-M2	DF-0725-080-M2	DF-0725-100-M2
7.30	9.0	1.0	DF-0730-070-M2	DF-0730-080-M2	DF-0730-100-M2
7.40	9.0	1.0	DF-0740-070-M2	DF-0740-080-M2	DF-0740-100-M2
7.50	10	1.0	DF-0750-070-M2	DF-0750-080-M2	DF-0750-100-M2
7.60	10	1.0	DF-0760-070-M2	DF-0760-080-M2	DF-0760-100-M2
7.70	10	1.0	DF-0770-070-M2	DF-0770-080-M2	DF-0770-100-M2
7.75	10	1.0	DF-0775-070-M2	DF-0775-080-M2	DF-0775-100-M2
7.80	10	1.0	DF-0780-070-M2	DF-0780-080-M2	DF-0780-100-M2
7.90	10	1.0	DF-0790-070-M2	DF-0790-080-M2	DF-0790-100-M2
8.00	10	1.0	DF-0800-070-M2	DF-0800-080-M2	DF-0800-100-M2
8.10	10	1.0	DF-0810-070-M2	DF-0810-080-M2	DF-0810-100-M2
8.20	10	1.0	DF-0820-070-M2	DF-0820-080-M2	DF-0820-100-M2
8.25	10	1.0	DF-0825-070-M2	DF-0825-080-M2	DF-0825-100-M2
8.30	10	1.0	DF-0830-070-M2	DF-0830-080-M2	DF-0830-100-M2
8.40	10	1.0	DF-0840-070-M2	DF-0840-080-M2	DF-0840-100-M2
8.50	11	1.0	DF-0850-070-M2	DF-0850-080-M2	DF-0850-100-M2
8.60	11	1.0	DF-0860-070-M2	DF-0860-080-M2	DF-0860-100-M2
8.70	11	1.0	DF-0870-070-M2	DF-0870-080-M2	DF-0870-100-M2
8.75	11	1.0	DF-0875-070-M2	DF-0875-080-M2	DF-0875-100-M2
8.80	11	1.0	DF-0880-070-M2	DF-0880-080-M2	DF-0880-100-M2
8.90	11	1.0	DF-0890-070-M2	DF-0890-080-M2	DF-0890-100-M2
9.00	11	1.0	DF-0900-070-M2	DF-0900-080-M2	DF-0900-100-M2
9.10	11	1.0	DF-0910-070-M2	DF-0910-080-M2	DF-0910-100-M2
9.20	11	1.0	DF-0920-070-M2	DF-0920-080-M2	DF-0920-100-M2
9.25	11	1.0	DF-0925-070-M2	DF-0925-080-M2	DF-0925-100-M2
9.30	11	1.0	DF-0930-070-M2	DF-0930-080-M2	DF-0930-100-M2
9.40	11	1.0	DF-0940-070-M2	DF-0940-080-M2	DF-0940-100-M2
9.50	12	1.0	DF-0950-070-M2	DF-0950-080-M2	DF-0950-100-M2
9.60	12	1.0	DF-0960-070-M2	DF-0960-080-M2	DF-0960-100-M2
9.70	12	1.0	DF-0970-070-M2	DF-0970-080-M2	DF-0970-100-M2
9.75	12	1.0	DF-0975-070-M2	DF-0975-080-M2	DF-0975-100-M2

DIA d1	d2 +/- 0.1	K +0.2 R-3	A2		
			70	80	100
5.70	7.0	0.5	DF-0570-070-A2	DF-0570-080-A2	DF-0570-100-A2
5.75	7.0	0.5	DF-0575-070-A2	DF-0575-080-A2	DF-0575-100-A2
5.80	7.0	0.5	DF-0580-070-A2	DF-0580-080-A2	DF-0580-100-A2
5.90	7.0	0.5	DF-0590-070-A2	DF-0590-080-A2	DF-0590-100-A2
6.00	8.0	0.5	DF-0600-070-A2	DF-0600-080-A2	DF-0600-100-A2
6.10	8.0	0.5	DF-0610-070-A2	DF-0610-080-A2	DF-0610-100-A2
6.20	8.0	0.5	DF-0620-070-A2	DF-0620-080-A2	DF-0620-100-A2
6.25	8.0	0.5	DF-0625-070-A2	DF-0625-080-A2	DF-0625-100-A2
6.30	8.0	0.5	DF-0630-070-A2	DF-0630-080-A2	DF-0630-100-A2
6.40	8.0	0.5	DF-0640-070-A2	DF-0640-080-A2	DF-0640-100-A2
6.50	9.0	1.0	DF-0650-070-A2	DF-0650-080-A2	
6.60	9.0	1.0	DF-0660-070-A2	DF-0660-080-A2	DF-0660-100-A2
6.70	9.0	1.0	DF-0670-070-A2	DF-0670-080-A2	DF-0670-100-A2
6.75	9.0	1.0	DF-0675-070-A2	DF-0675-080-A2	DF-0675-100-A2
6.80	9.0	1.0	DF-0680-070-A2	DF-0680-080-A2	DF-0680-100-A2
6.90	9.0	1.0	DF-0690-070-A2	DF-0690-080-A2	DF-0690-100-A2
7.00	9.0	1.0	DF-0700-070-A2	DF-0700-080-A2	DF-0700-100-A2
7.10	9.0	1.0	DF-0710-070-A2	DF-0710-080-A2	DF-0710-100-A2
7.20	9.0	1.0	DF-0720-070-A2	DF-0720-080-A2	DF-0720-100-A2
7.25	9.0	1.0	DF-0725-070-A2	DF-0725-080-A2	DF-0725-100-A2
7.30	9.0	1.0	DF-0730-070-A2	DF-0730-080-A2	DF-0730-100-A2
7.40	9.0	1.0	DF-0740-070-A2	DF-0740-080-A2	DF-0740-100-A2
7.50	10	1.0	DF-0750-070-A2	DF-0750-080-A2	DF-0750-100-A2
7.60	10	1.0	DF-0760-070-A2	DF-0760-080-A2	DF-0760-100-A2
7.70	10	1.0	DF-0770-070-A2	DF-0770-080-A2	DF-0770-100-A2
7.75	10	1.0	DF-0775-070-A2	DF-0775-080-A2	DF-0775-100-A2
7.80	10	1.0	DF-0780-070-A2	DF-0780-080-A2	DF-0780-100-A2
7.90	10	1.0	DF-0790-070-A2	DF-0790-080-A2	DF-0790-100-A2
8.00	10	1.0	DF-0800-070-A2	DF-0800-080-A2	DF-0800-100-A2
8.10	10	1.0	DF-0810-070-A2	DF-0810-080-A2	DF-0810-100-A2
8.20	10	1.0	DF-0820-070-A2	DF-0820-080-A2	DF-0820-100-A2
8.25	10	1.0	DF-0825-070-A2	DF-0825-080-A2	DF-0825-100-A2
8.30	10	1.0	DF-0830-070-A2	DF-0830-080-A2	DF-0830-100-A2
8.40	10	1.0	DF-0840-070-A2	DF-0840-080-A2	DF-0840-100-A2
8.50	11	1.0	DF-0850-070-A2	DF-0850-080-A2	DF-0850-100-A2
8.60	11	1.0	DF-0860-070-A2	DF-0860-080-A2	DF-0860-100-A2
8.70	11	1.0	DF-0870-070-A2	DF-0870-080-A2	DF-0870-100-A2
8.75	11	1.0	DF-0875-070-A2	DF-0875-080-A2	DF-0875-100-A2
8.80	11	1.0	DF-0880-070-A2	DF-0880-080-A2	DF-0880-100-A2
8.90	11	1.0	DF-0890-070-A2	DF-0890-080-A2	DF-0890-100-A2
9.00	11	1.0	DF-0900-070-A2	DF-0900-080-A2	DF-0900-100-A2
9.10	11	1.0	DF-0910-070-A2	DF-0910-080-A2	DF-0910-100-A2
9.20	11	1.0	DF-0920-070-A2	DF-0920-080-A2	DF-0920-100-A2
9.25	11	1.0	DF-0925-070-A2	DF-0925-080-A2	DF-0925-100-A2
9.30	11	1.0	DF-0930-070-A2	DF-0930-080-A2	DF-0930-100-A2
9.40	11	1.0	DF-0940-070-A2	DF-0940-080-A2	DF-0940-100-A2
9.50	12	1.0	DF-0950-070-A2	DF-0950-080-A2	DF-0950-100-A2
9.60	12	1.0	DF-0960-070-A2	DF-0960-080-A2	DF-0960-100-A2
9.70	12	1.0	DF-0970-070-A2	DF-0970-080-A2	DF-0970-100-A2
9.75	12	1.0	DF-0975-070-A2	DF-0975-080-A2	DF-0975-100-A2

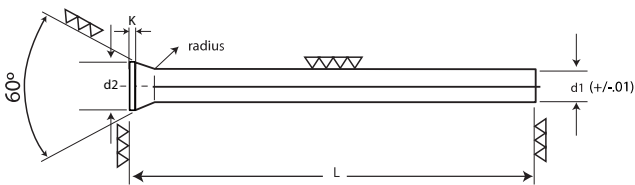


Materials: (HSS) M2, Tungsten High Speed Steel
Shank Hardness: 64 +/- 2 Hrc
Head Hardness: 50 +/- 5 Hrc.

Materials: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc
Head Hardness: 40 +/- 5 Hrc.

DIA d1	d2 +/- 0.1	K +0.2 R-3	HSS		
			70	80	100
9.80	12	1.0	DF-0980-070-M2	DF-0980-080-M2	DF-0980-100-M2
9.90	12	1.0	DF-0990-070-M2	DF-0990-080-M2	DF-0990-100-M2
10.00	12	1.0	DF-1000-070-M2	DF-1000-080-M2	DF-1000-100-M2
10.10	12	1.0	DF-1010-070-M2	DF-1010-080-M2	DF-1010-100-M2
10.20	12	1.0	DF-1020-070-M2	DF-1020-080-M2	DF-1020-100-M2
10.25	12	1.0	DF-1025-070-M2	DF-1025-080-M2	DF-1025-100-M2
10.30	12	1.0	DF-1030-070-M2	DF-1030-080-M2	DF-1030-100-M2
10.40	12	1.0	DF-1040-070-M2	DF-1040-080-M2	DF-1040-100-M2
10.50	13	1.0	DF-1050-070-M2	DF-1050-080-M2	DF-1050-100-M2
10.60	13	1.0	DF-1060-070-M2	DF-1060-080-M2	DF-1060-100-M2
10.70	13	1.0	DF-1070-070-M2	DF-1070-080-M2	DF-1070-100-M2
10.75	13	1.0	DF-1075-070-M2	DF-1075-080-M2	DF-1075-100-M2
10.80	13	1.0	DF-1080-070-M2	DF-1080-080-M2	DF-1080-100-M2
10.90	13	1.0	DF-1090-070-M2	DF-1090-080-M2	DF-1090-100-M2
11.00	13	1.0	DF-1100-070-M2	DF-1100-080-M2	DF-1100-100-M2
11.10	13	1.0	DF-1110-070-M2	DF-1110-080-M2	DF-1110-100-M2
11.20	13	1.0	DF-1120-070-M2	DF-1120-080-M2	DF-1120-100-M2
11.25	13	1.0	DF-1125-070-M2	DF-1125-080-M2	DF-1125-100-M2
11.30	13	1.0	DF-1130-070-M2	DF-1130-080-M2	DF-1130-100-M2
11.40	13	1.0	DF-1140-070-M2	DF-1140-080-M2	DF-1140-100-M2
11.50	14	1.0	DF-1150-070-M2	DF-1150-080-M2	DF-1150-100-M2
11.60	14	1.0	DF-1160-070-M2	DF-1160-080-M2	DF-1160-100-M2
11.70	14	1.0	DF-1170-070-M2	DF-1170-080-M2	DF-1170-100-M2
11.75	14	1.0	DF-1175-070-M2	DF-1175-080-M2	DF-1175-100-M2
11.80	14	1.0	DF-1180-070-M2	DF-1180-080-M2	DF-1180-100-M2
11.90	14	1.0	DF-1190-070-M2	DF-1190-080-M2	DF-1190-100-M2
12.00	14	1.0	DF-1200-070-M2	DF-1200-080-M2	DF-1200-100-M2
12.10	14	1.0	DF-1210-070-M2	DF-1210-080-M2	DF-1210-100-M2
12.20	14	1.0	DF-1220-070-M2	DF-1220-080-M2	DF-1220-100-M2
12.25	14	1.0	DF-1225-070-M2	DF-1225-080-M2	DF-1225-100-M2
12.30	14	1.0	DF-1230-070-M2	DF-1230-080-M2	DF-1230-100-M2
12.40	14	1.0	DF-1240-070-M2	DF-1240-080-M2	DF-1240-100-M2
12.50	15	1.0	DF-1250-070-M2	DF-1250-080-M2	DF-1250-100-M2
12.60	15	1.0	DF-1260-070-M2	DF-1260-080-M2	DF-1260-100-M2
12.70	15	1.0	DF-1270-070-M2	DF-1270-080-M2	DF-1270-100-M2
12.75	15	1.0	DF-1275-070-M2	DF-1275-080-M2	DF-1275-100-M2
12.80	15	1.0	DF-1280-070-M2	DF-1280-080-M2	DF-1280-100-M2
12.90	15	1.0	DF-1290-070-M2	DF-1290-080-M2	DF-1290-100-M2
13.00	15	1.0	DF-1300-070-M2	DF-1300-080-M2	DF-1300-100-M2
13.50	16	1.0	DF-1350-070-M2	DF-1350-080-M2	DF-1350-100-M2
14.00	16	1.0	DF-1400-070-M2	DF-1400-080-M2	DF-1400-100-M2
14.50	17	1.0	DF-1450-070-M2	DF-1450-080-M2	DF-1450-100-M2
14.80	17	1.0	DF-1480-070-M2	DF-1480-080-M2	DF-1480-100-M2
15.00	17	1.0	DF-1500-070-M2	DF-1500-080-M2	DF-1500-100-M2
15.50	18	1.0	DF-1550-070-M2	DF-1550-080-M2	DF-1550-100-M2
16.00	18	1.0	DF-1600-070-M2	DF-1600-080-M2	DF-1600-100-M2
16.50	19	1.0	DF-1650-070-M2	DF-1650-080-M2	DF-1650-100-M2
17.00	19	1.0	DF-1700-070-M2	DF-1700-080-M2	DF-1700-100-M2
17.50	20	1.0	DF-1750-070-M2	DF-1750-080-M2	DF-1750-100-M2
18.00	20	1.0	DF-1800-070-M2	DF-1800-080-M2	DF-1800-100-M2
18.50	21	1.0	DF-1850-070-M2	DF-1850-080-M2	DF-1850-100-M2
19.00	21	1.0	DF-1900-070-M2	DF-1900-080-M2	DF-1900-100-M2

DIA d1	d2 +/- 0.1	K +0.2 R-3	A2		
			70	80	100
9.80	12	1.0	DF-0980-070-A2	DF-0980-080-A2	DF-0980-100-A2
9.90	12	1.0		DF-0990-080-A2	DF-0990-100-A2
10.00	12	1.0	DF-1000-070-A2	DF-1000-080-A2	DF-1000-100-A2
10.10	12	1.0	DF-1010-070-A2	DF-1010-080-A2	DF-1010-100-A2
10.20	12	1.0	DF-1020-070-A2	DF-1020-080-A2	DF-1020-100-A2
10.25	12	1.0	DF-1025-070-A2	DF-1025-080-A2	DF-1025-100-A2
10.30	12	1.0	DF-1030-070-A2	DF-1030-080-A2	DF-1030-100-A2
10.40	12	1.0	DF-1040-070-A2	DF-1040-080-A2	DF-1040-100-A2
10.50	13	1.0	DF-1050-070-A2	DF-1050-080-A2	DF-1050-100-A2
10.60	13	1.0	DF-1060-070-A2	DF-1060-080-A2	DF-1060-100-A2
10.70	13	1.0	DF-1070-070-A2	DF-1070-080-A2	DF-1070-100-A2
10.75	13	1.0	DF-1075-070-A2	DF-1075-080-A2	DF-1075-100-A2
10.80	13	1.0	DF-1080-070-A2	DF-1080-080-A2	DF-1080-100-A2
10.90	13	1.0	DF-1090-070-A2	DF-1090-080-A2	DF-1090-100-A2
11.00	13	1.0	DF-1100-070-A2	DF-1100-080-A2	DF-1100-100-A2
11.10	13	1.0	DF-1110-070-A2	DF-1110-080-A2	DF-1110-100-A2
11.20	13	1.0	DF-1120-070-A2	DF-1120-080-A2	DF-1120-100-A2
11.25	13	1.0	DF-1125-070-A2	DF-1125-080-A2	DF-1125-100-A2
11.30	13	1.0	DF-1130-070-A2	DF-1130-080-A2	DF-1130-100-A2
11.40	13	1.0	DF-1140-070-A2	DF-1140-080-A2	DF-1140-100-A2
11.50	14	1.0	DF-1150-070-A2	DF-1150-080-A2	DF-1150-100-A2
11.60	14	1.0	DF-1160-070-A2	DF-1160-080-A2	DF-1160-100-A2
11.70	14	1.0	DF-1170-070-A2	DF-1170-080-A2	DF-1170-100-A2
11.75	14	1.0	DF-1175-070-A2	DF-1175-080-A2	DF-1175-100-A2
11.80	14	1.0	DF-1180-070-A2	DF-1180-080-A2	DF-1180-100-A2
11.90	14	1.0	DF-1190-070-A2	DF-1190-080-A2	DF-1190-100-A2
12.00	14	1.0	DF-1200-070-A2	DF-1200-080-A2	DF-1200-100-A2
12.10	14	1.0	DF-1210-070-A2	DF-1210-080-A2	DF-1210-100-A2
12.20	14	1.0	DF-1220-070-A2	DF-1220-080-A2	DF-1220-100-A2
12.25	14	1.0	DF-1225-070-A2	DF-1225-080-A2	DF-1225-100-A2
12.30	14	1.0	DF-1230-070-A2	DF-1230-080-A2	DF-1230-100-A2
12.40	14	1.0	DF-1240-070-A2	DF-1240-080-A2	DF-1240-100-A2
12.50	15	1.0	DF-1250-070-A2	DF-1250-080-A2	DF-1250-100-A2
12.60	15	1.0	DF-1260-070-A2	DF-1260-080-A2	DF-1260-100-A2
12.70	15	1.0	DF-1270-070-A2		
12.75	15	1.0	DF-1275-070-A2	DF-1275-080-A2	DF-1275-100-A2
12.80	15	1.0	DF-1280-070-A2	DF-1280-080-A2	DF-1280-100-A2
12.90	15	1.0	DF-1290-070-A2	DF-1290-080-A2	DF-1290-100-A2
13.00	15	1.0	DF-1300-070-A2	DF-1300-080-A2	DF-1300-100-A2
13.50	16	1.0	DF-1350-070-A2	DF-1350-080-A2	DF-1350-100-A2
14.00	16	1.0	DF-1400-070-A2	DF-1400-080-A2	DF-1400-100-A2
14.50	17	1.0	DF-1450-070-A2	DF-1450-080-A2	DF-1450-100-A2
15.00	17	1.0	DF-1500-070-A2	DF-1500-080-A2	DF-1500-100-A2
15.50	18	1.0	DF-1550-070-A2	DF-1550-080-A2	DF-1550-100-A2
16.00	18	1.0	DF-1600-070-A2	DF-1600-080-A2	DF-1600-100-A2
16.50	19	1.0	DF-1650-070-A2	DF-1650-080-A2	DF-1650-100-A2
17.00	19	1.0	DF-1700-070-A2	DF-1700-080-A2	DF-1700-100-A2
17.50	20	1.0	DF-1750-070-A2	DF-1750-080-A2	DF-1750-100-A2
18.00	20	1.0	DF-1800-070-A2	DF-1800-080-A2	DF-1800-100-A2
18.50	21	1.0	DF-1850-070-A2	DF-1850-080-A2	DF-1850-100-A2
19.00	21	1.0	DF-1900-070-A2	DF-1900-080-A2	DF-1900-100-A2



Materials: (HSS) M2, Tungsten High Speed Steel
Shank Hardness: 64 +/- 2 Hrc
Head Hardness: 50 +/- 5 Hrc.

Materials: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc
Head Hardness: 40 +/- 5 Hrc.

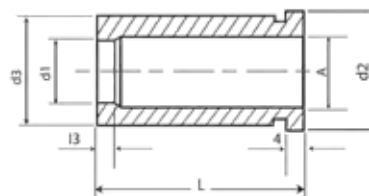
DIA d1	d2 +/- 0.1	K +0.2 R-3	HSS		
			70	80	100
19.50	22	1.0	DF-1950-070-M2	DF-1950-080-M2	DF-1950-100-M2
20.00	22	1.0	DF-2000-070-M2	DF-2000-080-M2	DF-2000-100-M2
21.00	23	1.0	DF-2100-070-M2	DF-2100-080-M2	DF-2100-100-M2
22.00	24	1.0	DF-2200-070-M2	DF-2200-080-M2	DF-2200-100-M2
23.00	25	1.0	DF-2300-070-M2	DF-2300-080-M2	DF-2300-100-M2
24.00	26	1.0	DF-2400-070-M2	DF-2400-080-M2	DF-2400-100-M2
25.00	27	1.0	DF-2500-070-M2	DF-2500-080-M2	DF-2500-100-M2

DIA d1	d2 +/- 0.1	K +0.2 R-3	A2		
			70	80	100
19.50	22	1.0	DF-1950-070-A2	DF-1950-080-A2	DF-1950-100-A2
20.00	22	1.0	DF-2000-070-A2	DF-2000-080-A2	DF-2000-100-A2
21.00	23	1.0	DF-2100-070-A2	DF-2100-080-A2	DF-2100-100-A2
22.00	24	1.0	DF-2200-070-A2	DF-2200-080-A2	DF-2200-100-A2
23.00	25	1.0	DF-2300-070-A2	DF-2300-080-A2	DF-2300-100-A2
24.00	26	1.0	DF-2400-070-A2	DF-2400-080-A2	DF-2400-100-A2
25.00	27	1.0	DF-2500-070-A2	DF-2500-080-A2	DF-2500-100-A2





Tolerance
d1 = H8
d3 = k6



Material: (HSS) M2 Tungsten High Speed Steel
Shank Hardness: 64 +/- 2 Hrc.
Head Hardness: 50 +/- 5 Hrc.

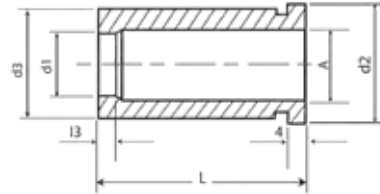
Material: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc.
Head Hardness: 45 +/- 5 Hrc.

DIA d1	DIA d3	d2	A	l3	HSS	
					20	28
1.00	6	8	2.5	2	DIB-0100-20-M2	DIB-0100-28-M2
1.05	6	8	2.5	2	DIB-0105-20-M2	
1.10	6	8	2.5	2	DIB-0110-20-M2	DIB-0110-28-M2
1.20	6	8	2.5	2	DIB-0120-20-M2	DIB-0120-28-M2
1.30	6	8	2.5	2	DIB-0130-20-M2	DIB-0130-28-M2
1.40	6	8	2.5	2	DIB-0140-20-M2	DIB-0140-28-M2
1.50	6	8	2.5	2	DIB-0150-20-M2	DIB-0150-28-M2
1.60	6	8	2.5	2	DIB-0160-20-M2	DIB-0160-28-M2
1.70	6	8	2.5	2	DIB-0170-20-M2	DIB-0170-28-M2
1.75	6	8	2.5	2	DIB-0175-20-M2	DIB-0175-28-M2
1.80	6	8	2.5	2	DIB-0180-20-M2	DIB-0180-28-M2
1.90	6	8	2.5	2	DIB-0190-20-M2	DIB-0190-28-M2
2.00	6	8	2.5	2	DIB-0200-20-M2	DIB-0200-28-M2
2.10	7	9	3.5	3	DIB-0210-20-M2	DIB-0210-28-M2
2.20	7	9	3.5	3	DIB-0220-20-M2	DIB-0220-28-M2
2.25	7	9	3.5	3	DIB-0225-20-M2	DIB-0225-28-M2
2.30	7	9	3.5	3	DIB-0230-20-M2	DIB-0230-28-M2
2.40	7	9	3.5	3	DIB-0240-20-M2	DIB-0240-28-M2
2.50	7	9	3.5	3	DIB-0250-20-M2	DIB-0250-28-M2
2.60	7	9	3.5	3	DIB-0260-20-M2	DIB-0260-28-M2
2.70	7	9	3.5	3	DIB-0270-20-M2	DIB-0270-28-M2
2.75	7	9	3.5	3	DIB-0275-20-M2	DIB-0275-28-M2
2.80	7	9	3.5	3	DIB-0280-20-M2	DIB-0280-28-M2
2.90	7	9	3.5	3	DIB-0290-20-M2	DIB-0290-28-M2
3.00	7	9	3.5	3	DIB-0300-20-M2	DIB-0300-28-M2
3.05	7	9	3.5	3	DIB-0305-20-M2	DIB-0305-28-M2
3.10	8	10	4.5	4	DIB-0310-20-M2	DIB-0310-28-M2
3.20	8	10	4.5	4	DIB-0320-20-M2	DIB-0320-28-M2
3.25	8	10	4.5	4	DIB-0325-20-M2	DIB-0325-28-M2
3.30	8	10	4.5	4	DIB-0330-20-M2	DIB-0330-28-M2
3.40	8	10	4.5	4	DIB-0340-20-M2	DIB-0340-28-M2
3.50	8	10	4.5	4	DIB-0350-20-M2	DIB-0350-28-M2
3.60	8	10	4.5	4	DIB-0360-20-M2	DIB-0360-28-M2
3.70	8	10	4.5	4	DIB-0370-20-M2	DIB-0370-28-M2
3.75	8	10	4.5	4	DIB-0375-20-M2	DIB-0375-28-M2
3.80	8	10	4.5	4	DIB-0380-20-M2	DIB-0380-28-M2
3.90	8	10	4.5	4	DIB-0390-20-M2	DIB-0390-28-M2
4.00	8	10	4.5	4	DIB-0400-20-M2	DIB-0400-28-M2
4.10	10	12	5.5	4	DIB-0410-20-M2	DIB-0410-28-M2
4.20	10	12	5.5	4	DIB-0420-20-M2	DIB-0420-28-M2
4.25	10	12	5.5	4	DIB-0425-20-M2	
4.30	10	12	5.5	4	DIB-0430-20-M2	DIB-0430-28-M2
4.40	10	12	5.5	4	DIB-0440-20-M2	DIB-0440-28-M2
4.50	10	12	5.5	4	DIB-0450-20-M2	DIB-0450-28-M2
4.60	10	12	5.5	4	DIB-0460-20-M2	DIB-0460-28-M2
4.70	10	12	5.5	4	DIB-0470-20-M2	DIB-0470-28-M2
4.75	10	12	5.5	4	DIB-0475-20-M2	
4.80	10	12	5.5	4	DIB-0480-20-M2	DIB-0480-28-M2
4.90	10	12	5.5	4	DIB-0490-20-M2	DIB-0490-28-M2
5.00	12	14	6.5	4	DIB-0500-20-M2	DIB-0500-28-M2

DIA d1	DIA d3	d2	A	l3	A2	
					20	28
1.00	6	8	2.5	2	DIB-0100-20-A2	DIB-0100-28-A2
1.05	6	8	2.5	2	DIB-0105-20-A2	DIB-0105-20-A2
1.10	6	8	2.5	2	DIB-0110-20-A2	DIB-0110-28-A2
1.20	6	8	2.5	2	DIB-0110-20-A2	DIB-0110-28-A2
1.30	6	8	2.5	2	DIB-0120-20-A2	DIB-0120-28-A2
1.40	6	8	2.5	2	DIB-0130-20-A2	DIB-0130-28-A2
1.50	6	8	2.5	2	DIB-0140-20-A2	DIB-0140-28-A2
1.60	6	8	2.5	2	DIB-0150-20-A2	DIB-0150-28-A2
1.70	6	8	2.5	2	DIB-0160-20-A2	DIB-0160-28-A2
1.75	6	8	2.5	2	DIB-0170-20-A2	DIB-0170-28-A2
1.80	6	8	2.5	2	DIB-0175-20-A2	DIB-0175-28-A2
1.90	7	9	3.5	3	DIB-0180-20-A2	DIB-0180-28-A2
2.00	7	9	3.5	3	DIB-0200-20-A2	DIB-0200-28-A2
2.10	7	9	3.5	3	DIB-0210-20-A2	DIB-0210-28-A2
2.20	7	9	3.5	3	DIB-0220-20-A2	DIB-0220-28-A2
2.25	7	9	3.5	3	DIB-0225-20-A2	DIB-0225-28-A2
2.30	7	9	3.5	3	DIB-0230-20-A2	DIB-0230-28-A2
2.40	7	9	3.5	3	DIB-0240-20-A2	DIB-0240-28-A2
2.50	7	9	3.5	3	DIB-0250-20-A2	DIB-0250-28-A2
2.60	7	9	3.5	3	DIB-0260-20-A2	DIB-0260-28-A2
2.70	7	9	3.5	3	DIB-0270-20-A2	DIB-0270-28-A2
2.75	7	9	3.5	3	DIB-0275-20-A2	DIB-0275-28-A2
2.80	7	9	3.5	3	DIB-0280-20-A2	DIB-0280-28-A2
2.90	7	9	3.5	3	DIB-0290-20-A2	DIB-0290-28-A2
3.00	7	9	3.5	3	DIB-0300-20-A2	DIB-0300-28-A2
3.05	7	9	3.5	3	DIB-0305-20-A2	DIB-0305-28-A2
3.10	7	9	3.5	3	DIB-0310-20-A2	DIB-0310-28-A2
3.20	7	9	3.5	3	DIB-0320-20-A2	DIB-0320-28-A2
3.25	7	9	3.5	3	DIB-0325-20-A2	DIB-0325-28-A2
3.30	7	9	3.5	3	DIB-0330-20-A2	DIB-0330-28-A2
3.40	8	10	4.5	4	DIB-0340-20-M2	DIB-0340-28-M2
3.50	8	10	4.5	4	DIB-0350-20-M2	DIB-0350-28-M2
3.60	8	10	4.5	4	DIB-0360-20-M2	DIB-0360-28-M2
3.70	8	10	4.5	4	DIB-0370-20-M2	DIB-0370-28-M2
3.75	8	10	4.5	4	DIB-0375-20-M2	DIB-0375-28-M2
3.80	8	10	4.5	4		DIB-0380-28-M2
3.90	8	10	4.5	4	DIB-0390-20-M2	DIB-0390-28-M2
4.00	8	10	4.5	4	DIB-0400-20-A2	DIB-0400-28-A2
4.10	10	12	5.5	4	DIB-0410-20-A2	DIB-0410-28-A2
4.20	10	12	5.5	4		DIB-0420-28-A2
4.30	10	12	5.5	4	DIB-0430-20-A2	DIB-0430-28-A2
4.40	10	12	5.5	4	DIB-0440-20-A2	DIB-0440-28-A2
4.50	10	12	5.5	4	DIB-0450-20-A2	DIB-0450-28-A2
4.60	10	12	5.5	4	DIB-0460-20-A2	DIB-0460-28-A2
4.70	10	12	5.5	4	DIB-0470-20-A2	DIB-0470-28-A2
4.75	10	12	5.5	4		DIB-0475-20-A2
4.80	10	12	5.5	4		DIB-0480-28-A2
4.90	10	12	5.5	4		DIB-0490-28-A2
5.00	12	14	6.5	4		DIB-0500-28-A2



Tolerance
d1 = H8
d3 = k6



Material: (HSS) M2 Tungsten High Speed Steel
Shank Hardness: 64 +/- 2 Hrc.
Head Hardness: 50 +/- 5 Hrc.

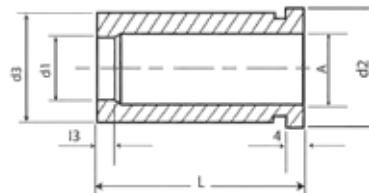
Material: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc.
Head Hardness: 45 +/- 5 Hrc.

DIA d1	DIA d3	d2	A	I3	HSS	
					20	28
5.10	12	14	6.5	4	DIB-0510-20-M2	DIB-0510-28-M2
5.20	12	14	6.5	4	DIB-0520-20-M2	DIB-0520-28-M2
5.25	12	14	6.5	4	DIB-0525-20-M2	
5.30	12	14	6.5	4	DIB-0530-20-M2	DIB-0530-28-M2
5.40	12	14	6.5	4	DIB-0540-20-M2	DIB-0540-28-M2
5.50	12	14	6.5	4	DIB-0550-20-M2	DIB-0550-28-M2
5.60	12	14	6.5	4	DIB-0560-20-M2	DIB-0560-28-M2
5.70	12	14	6.5	4	DIB-0570-20-M2	DIB-0570-28-M2
5.75	12	14	6.5	4	DIB-0575-20-M2	
5.80	12	14	6.5	4	DIB-0580-20-M2	DIB-0580-28-M2
5.90	12	14	6.5	4	DIB-0590-20-M2	DIB-0590-28-M2
6.00	12	14	6.5	4	DIB-0600-20-M2	DIB-0600-28-M2
6.10	15	17	7.5	4	DIB-0610-20-M2	DIB-0610-28-M2
6.20	15	17	7.5	4	DIB-0620-20-M2	DIB-0620-28-M2
6.25	15	17	7.5	4	DIB-0625-20-M2	
6.30	15	17	7.5	4	DIB-0630-20-M2	DIB-0630-28-M2
6.40	15	17	7.5	4	DIB-0640-20-M2	DIB-0640-28-M2
6.50	15	17	7.5	4	DIB-0650-20-M2	DIB-0650-28-M2
6.60	15	17	7.5	4	DIB-0660-20-M2	DIB-0660-28-M2
6.70	15	17	7.5	4	DIB-0670-20-M2	DIB-0670-28-M2
6.75	15	17	7.5	4	DIB-0675-20-M2	
6.80	15	17	7.5	4	DIB-0680-20-M2	DIB-0680-28-M2
6.90	15	17	7.5	4	DIB-0690-20-M2	DIB-0690-28-M2
7.00	15	17	7.5	4	DIB-0700-20-M2	DIB-0700-28-M2
7.10	15	17	7.5	4	DIB-0710-20-M2	DIB-0710-28-M2
7.20	15	17	7.5	4	DIB-0720-20-M2	DIB-0720-28-M2
7.25	15	17	7.5	4	DIB-0725-20-M2	
7.30	15	17	7.5	4	DIB-0730-20-M2	DIB-0730-28-M2
7.40	15	17	7.5	4	DIB-0740-20-M2	DIB-0740-28-M2
7.50	15	17	7.5	4	DIB-0750-20-M2	DIB-0750-28-M2
7.60	15	17	7.5	4	DIB-0760-20-M2	DIB-0760-28-M2
7.70	15	17	7.5	4	DIB-0770-20-M2	DIB-0770-28-M2
7.75	15	17	7.5	4	DIB-0775-20-M2	
7.80	15	17	7.5	4	DIB-0780-20-M2	DIB-0780-28-M2
7.90	15	17	7.5	4	DIB-0790-20-M2	DIB-0790-28-M2
8.00	15	17	7.5	4	DIB-0800-20-M2	DIB-0800-28-M2
8.10	18	20	9.5	4	DIB-0810-20-M2	DIB-0810-28-M2
8.20	18	20	9.5	4	DIB-0820-20-M2	DIB-0820-28-M2
8.25	18	20	9.5	4	DIB-0825-20-M2	
8.30	18	20	9.5	4	DIB-0830-20-M2	DIB-0830-28-M2
8.40	18	20	9.5	4	DIB-0840-20-M2	DIB-0840-28-M2
8.50	18	20	9.5	4	DIB-0850-20-M2	DIB-0850-28-M2
8.60	18	20	9.5	4	DIB-0860-20-M2	DIB-0860-28-M2
8.70	18	20	9.5	4	DIB-0870-20-M2	DIB-0870-28-M2
8.75	18	20	9.5	4	DIB-0875-20-M2	
8.80	18	20	9.5	4	DIB-0880-20-M2	DIB-0880-28-M2
8.90	18	20	9.5	4	DIB-0890-20-M2	DIB-0890-28-M2
9.00	18	20	9.5	4	DIB-0900-20-M2	DIB-0900-28-M2
9.10	18	20	9.5	4	DIB-0910-20-M2	DIB-0910-28-M2
9.20	18	20	9.5	4	DIB-0920-20-M2	DIB-0920-28-M2

DIA d1	DIA d3	d2	A	I3	A2	
					20	28
5.10	12	14	6.5	4		DIB-0510-28-A2
5.20	12	14	6.5	4		DIB-0520-28-A2
5.25	12	14	6.5	4		DIB-0525-20-A2
5.30	12	14	6.5	4		DIB-0530-28-A2
5.40	12	14	6.5	4		DIB-0540-28-A2
5.50	12	14	6.5	4		DIB-0550-28-A2
5.60	12	14	6.5	4	DIB-0560-20-A2	DIB-0560-28-A2
5.70	12	14	6.5	4		DIB-0570-28-A2
5.75	12	14	6.5	4		DIB-0575-28-A2
5.80	12	14	6.5	4		DIB-0580-28-A2
5.90	12	14	6.5	4		DIB-0590-28-A2
6.00	12	14	6.5	4		DIB-0600-28-A2
6.10	15	17	7.5	4	DIB-0610-20-A2	DIB-0610-28-A2
6.20	15	17	7.5	4		DIB-0620-28-A2
6.30	15	17	7.5	4		DIB-0630-28-A2
6.40	15	17	7.5	4		DIB-0640-28-A2
6.50	15	17	7.5	4		DIB-0650-28-A2
6.60	15	17	7.5	4	DIB-0660-20-A2	DIB-0660-28-A2
6.70	15	17	7.5	4		DIB-0670-28-A2
6.75	15	17	7.5	4		
6.80	15	17	7.5	4		DIB-0690-28-M2
6.90	15	17	7.5	4		DIB-0690-28-M2
7.00	15	17	7.5	4		DIB-0700-28-A2
7.10	15	17	7.5	4	DIB-0710-20-A2	DIB-0710-28-A2
7.20	15	17	7.5	4		DIB-0720-28-A2
7.30	15	17	7.5	4		DIB-0730-28-A2
7.40	15	17	7.5	4		DIB-0740-28-A2
7.50	15	17	7.5	4		DIB-0750-28-A2
7.60	15	17	7.5	4	DIB-0760-20-A2	DIB-0760-28-A2
7.70	15	17	7.5	4		DIB-0770-28A2
7.80	15	17	7.5	4		DIB-0790-28-A2
7.90	15	17	7.5	4		DIB-0790-28-A2
8.00	15	17	7.5	4		DIB-0800-28-A2
8.10	18	20	9.5	4	DIB-0810-20-A2	DIB-0810-28-A2
8.20	18	20	9.5	4		DIB-0820-28-A2
8.30	18	20	9.5	4		DIB-0830-28-A2
8.40	18	20	9.5	4		DIB-0840-28-A2
8.50	18	20	9.5	4		DIB-0850-28-A2
8.60	18	20	9.5	4	DIB-0860-20-A2	DIB-0860-28-A2
8.70	18	20	9.5	4		DIB-0870-28-A2
8.80	18	20	9.5	4		DIB-0880-28-A2
8.90	18	20	9.5	4		DIB-0890-28-A2
9.00	18	20	9.5	4		DIB-0900-28-A2
9.10	18	20	9.5	4	DIB-0910-20-A2	DIB-0910-28-A2
9.20	18	20	9.5	4		DIB-0920-28-A2



Tolerance
d1 = H8
d3 = k6



Material: (HSS) M2 Tungsten High Speed Steel
Shank Hardness: 64 +/- 2 Hrc.
Head Hardness: 50 +/- 5 Hrc.

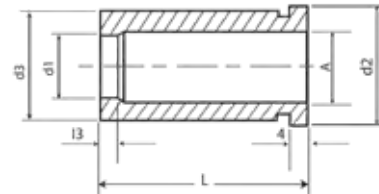
Material: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc.
Head Hardness: 45 +/- 5 Hrc.

DIA d1	DIA d3	d2	A	I3	HSS	
					20	28
9.25	18	20	9.5	4	DIB-0925-20-M2	
9.30	18	20	9.5	4	DIB-0930-20-M2	DIB-0930-28-M2
9.40	18	20	9.5	4	DIB-0940-20-M2	DIB-0940-28-M2
9.50	18	20	9.5	4	DIB-0950-20-M2	DIB-0950-28-M2
9.60	18	20	9.5	4	DIB-0960-20-M2	DIB-0960-28-M2
9.70	18	20	9.5	4	DIB-0970-20-M2	DIB-0970-28-M2
9.75	18	20	9.5	4	DIB-0975-20-M2	
9.80	18	20	9.5	4	DIB-0980-20-M2	DIB-0980-28-M2
9.90	18	20	9.5	4	DIB-0990-20-M2	DIB-0990-28-M2
10.00	18	20	9.5	4	DIB-1000-20-M2	DIB-1000-28-M2
10.10	22	24	12	4	DIB-1010-20-M2	DIB-1010-28-M2
10.20	22	24	12	4	DIB-1020-20-M2	DIB-1020-28-M2
10.25	22	24	12	4		DIB-1025-28-M2
10.30	22	24	12	4	DIB-1030-20-M2	DIB-1030-28-M2
10.40	22	24	12	4	DIB-1040-20-M2	DIB-1040-28-M2
10.50	22	24	12	4	DIB-1050-20-M2	DIB-1050-28-M2
10.60	22	24	12	4	DIB-1060-20-M2	DIB-1060-28-M2
10.70	22	24	12	4	DIB-1070-20-M2	DIB-1070-28-M2
10.80	22	24	12	4	DIB-1080-20-M2	DIB-1080-28-M2
10.90	22	24	12	4	DIB-1090-20-M2	DIB-1090-28-M2
11.00	22	24	12	4	DIB-1100-20-M2	DIB-1100-28-M2
11.10	22	24	12	4	DIB-1110-20-M2	DIB-1110-28-M2
11.20	22	24	12	4	DIB-1120-20-M2	DIB-1120-28-M2
11.30	22	24	12	4	DIB-1130-20-M2	DIB-1130-28-M2
11.40	22	24	12	4	DIB-1140-20-M2	DIB-1140-28-M2
11.50	22	24	12	4	DIB-1150-20-M2	DIB-1150-28-M2
11.60	22	24	12	4	DIB-1160-20-M2	DIB-1160-28-M2
11.70	22	24	12	4	DIB-1170-20-M2	DIB-1170-28-M2
11.80	22	24	12	4	DIB-1180-20-M2	DIB-1180-28-M2
11.90	22	24	12	4	DIB-1190-20-M2	DIB-1190-28-M2
12.00	22	24	12	4	DIB-1200-20-M2	DIB-1200-28-M2
12.10	26	28	14	4	DIB-1210-20-M2	DIB-1210-28-M2
12.20	26	28	14	4	DIB-1220-20-M2	DIB-1220-28-M2
12.30	26	28	14	4	DIB-1230-20-M2	DIB-1230-28-M2
12.40	26	28	14	4	DIB-1240-20-M2	DIB-1240-28-M2
12.50	26	28	14	4	DIB-1250-20-M2	DIB-1250-28-M2
12.60	26	28	14	4	DIB-1260-20-M2	DIB-1260-28-M2
12.70	26	28	14	4	DIB-1270-20-M2	DIB-1270-28-M2
12.80	26	28	14	4	DIB-1280-20-M2	DIB-1280-28-M2
12.90	26	28	14	4	DIB-1290-20-M2	DIB-1290-28-M2
13.00	26	28	14	4	DIB-1300-20-M2	DIB-1300-28-M2
13.10	26	28	14	4	DIB-1310-20-M2	DIB-1310-28-M2
13.20	26	28	14	4	DIB-1320-20-M2	DIB-1320-28-M2
13.30	26	28	14	4	DIB-1330-20-M2	DIB-1330-28-M2
13.40	26	28	14	4	DIB-1340-20-M2	DIB-1340-28-M2
13.50	26	28	14	4	DIB-1350-20-M2	DIB-1350-28-M2
13.60	26	28	14	4	DIB-1360-20-M2	DIB-1360-28-M2
13.70	26	28	14	4	DIB-1370-20-M2	DIB-1370-28-M2
13.80	26	28	14	4	DIB-1380-20-M2	DIB-1380-28-M2
13.90	26	28	14	4	DIB-1390-20-M2	DIB-1390-28-M2

DIA d1	DIA d3	d2	A	I3	A2	
					20	28
9.30	18	20	9.5	4	DIB-0930-20-A2	DIB-0930-28-A2
9.40	18	20	9.5	4	DIB-0940-20-A2	DIB-0940-28-A2
9.50	18	20	9.5	4	DIB-0950-20-A2	DIB-0950-28-A2
9.60	18	20	9.5	4	DIB-0960-20-A2	DIB-0960-28-A2
9.70	18	20	9.5	4		DIB-0970-28-A2
9.80	18	20	9.5	4		DIB-0980-28-A2
9.90	18	20	9.5	4		DIB-0990-28-A2
10.00	18	20	9.5	4		DIB-1000-28-A2
10.10	22	24	12	4	DIB-1010-20-A2	DIB-1010-28-A2
10.20	22	24	12	4		DIB-1020-28-A2
10.30	22	24	12	4		DIB-1030-28-A2
10.40	22	24	12	4		DIB-1040-28-A2
10.50	22	24	12	4		DIB-1050-28-A2
10.60	22	24	12	4	DIB-1060-28-A2	DIB-1060-28-A2
10.70	22	24	12	4		DIB-1070-28-A2
10.80	22	24	12	4		DIB-1080-28-A2
10.90	22	24	12	4		DIB-1090-28-A2
11.00	22	24	12	4		DIB-1100-28-A2
11.10	22	24	12	4	DIB-1110-20-A2	DIB-1110-28-A2
11.20	22	24	12	4		DIB-1120-28-A2
11.30	22	24	12	4		DIB-1130-28-A2
11.40	22	24	12	4	DIB-1140-20-A2	DIB-1140-28-A2
11.50	22	24	12	4		DIB-1150-28-A2
11.60	22	24	12	4	DIB-1160-20-A2	DIB-1160-28-A2
11.70	22	24	12	4		DIB-1170-28-A2
11.80	22	24	12	4		DIB-1180-28-A2
11.90	22	24	12	4		DIB-1190-28-A2
12.00	22	24	12	4		DIB-1200-28-A2
12.10	26	28	14	4	DIB-1210-20-A2	DIB-1210-28-A2
12.20	26	28	14	4		DIB-1220-28-A2
12.30	26	28	14	4		DIB-1230-28-A2
12.40	26	28	14	4		DIB-1240-28-A2
12.50	26	28	14	4		DIB-1250-28-A2
12.60	26	28	14	4	DIB-1260-20-A2	DIB-1260-28-A2
12.70	26	28	14	4		DIB-1270-28-A2
12.80	26	28	14	4		DIB-1280-28-A2
12.90	26	28	14	4		DIB-1290-28-A2
13.00	26	28	14	4		DIB-1300-28-A2
13.10	26	28	14	4	DIB-1310-20-A2	DIB-1310-28-A2
13.20	26	28	14	4		DIB-1320-28-A2
13.30	26	28	14	4		DIB-1330-28-A2
13.40	26	28	14	4		DIB-1340-28-A2
13.50	26	28	14	4		DIB-1350-28-A2
13.60	26	28	14	4		DIB-1360-28-A2
13.70	26	28	14	4		DIB-1370-28-A2
13.80	26	28	14	4		DIB-1380-28-A2
13.90	26	28	14	4		DIB-1390-28-A2



Tolerance
d1 = H8
d3 = k6



Material: (HSS) M2 Tungsten High Speed Steel
Shank Hardness: 64 +/- 2 Hrc.
Head Hardness: 50 +/- 5 Hrc.

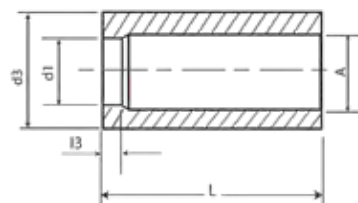
Material: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc.
Head Hardness: 45 +/- 5 Hrc.

DIA d1	DIA d3	d2	A	l3	HSS	
					20	28
14.00	26	28	14	4	DIB-1400-20-M2	DIB-1400-28-M2
14.10	26	28	16	4	DIB-1410-20-M2	DIB-1410-28-M2
14.20	26	28	16	4	DIB-1420-20-M2	DIB-1420-28-M2
14.30	26	28	16	4	DIB-1430-20-M2	DIB-1430-28-M2
14.40	26	28	16	4	DIB-1440-20-M2	DIB-1440-28-M2
14.50	26	28	16	4	DIB-1450-20-M2	DIB-1450-28-M2
14.60	26	28	16	4	DIB-1460-20-M2	DIB-1460-28-M2
14.70	26	28	16	4	DIB-1470-20-M2	DIB-1470-28-M2
14.80	26	28	16	4	DIB-1480-20-M2	DIB-1480-28-M2
14.90	26	28	16	4	DIB-1490-20-M2	DIB-1490-28-M2
15.00	26	28	16	4	DIB-1500-20-M2	DIB-1500-28-M2
16.10	26	28	16	4		DIB-1610-28-M2

DIA d1	DIA d3	d2	A	l3	A2	
					20	28
14.00	26	28	14	4		DIB-1400-28-A2
14.10	26	28	16	4		DIB-1410-28-A2
14.20	26	28	16	4	DIB-1420-20-A2	DIB-1420-28-A2
14.30	26	28	16	4	DIB-1430-20-A2	DIB-1430-28-A2
14.40	26	28	16	4	DIB-1440-20-A2	DIB-1440-28-A2
14.50	26	28	16	4	DIB-1450-20-A2	DIB-1450-28-A2
14.60	26	28	16	4	DIB-1460-20-A2	DIB-1460-28-A2
14.70	26	28	16	4	DIB-1470-20-A2	DIB-1470-28-A2
14.80	26	28	16	4	DIB-1480-20-A2	DIB-1480-28-A2
14.90	26	28	16	4	DIB-1490-20-A2	DIB-1490-28-A2
15.00	26	28	16	4	DIB-1500-20-A2	DIB-1500-28-A2



Tolerance
d1 = H8
d3 = n6



Material: (HSS) M2 Tungsten High Speed Steel
Shank Hardness: 64 +/- 2 Hrc.
Head Hardness: 50 +/- 5 Hrc.

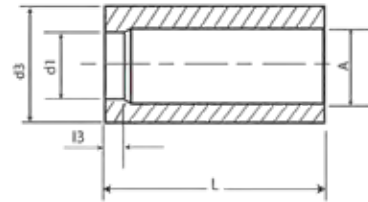
DIA d1	DIA d3	A	I3	HSS	
				20	28
1.00	6	2.5	2	DIA-0100-20-M2	DIA-0100-28-M2
1.05	6	2.5	2	DIA-0105-20-M2	
1.10	6	2.5	2	DIA-0110-20-M2	DIA-0110-28-M2
1.20	6	2.5	2	DIA-0120-20-M2	DIA-0120-28-M2
1.30	6	2.5	2	DIA-0130-20-M2	DIA-0130-28-M2
1.40	6	2.5	2	DIA-0140-20-M2	DIA-0140-28-M2
1.50	6	2.5	2	DIA-0150-20-M2	DIA-0150-28-M2
1.60	6	2.5	2	DIA-0160-20-M2	DIA-0160-28-M2
1.70	6	2.5	2	DIA-0170-20-M2	DIA-0170-28-M2
1.75	6	2.5	2	DIA-0175-20-M2	DIA-0175-28-M2
1.80	6	2.5	2	DIA-0180-20-M2	DIA-0180-28-M2
1.90	6	2.5	2	DIA-0190-20-M2	DIA-0190-28-M2
2.00	6	2.5	2	DIA-0200-20-M2	DIA-0200-28-M2
2.10	7	3.5	3	DIA-0210-20-M2	DIA-0210-28-M2
2.20	7	3.5	3	DIA-0220-20-M2	DIA-0220-28-M2
2.25	7	3.5	3	DIA-0225-20-M2	DIA-0225-28-M2
2.30	7	3.5	3	DIA-0230-20-M2	DIA-0230-28-M2
2.40	7	3.5	3	DIA-0240-20-M2	DIA-0240-28-M2
2.50	7	3.5	3	DIA-0250-20-M2	DIA-0250-28-M2
2.60	7	3.5	3	DIA-0260-20-M2	DIA-0260-28-M2
2.70	7	3.5	3	DIA-0270-20-M2	DIA-0270-28-M2
2.75	7	3.5	3	DIA-0275-20-M2	DIA-0275-28-M2
2.80	7	3.5	3	DIA-0280-20-M2	DIA-0280-28-M2
2.90	7	3.5	3	DIA-0290-20-M2	DIA-0290-28-M2
3.00	7	3.5	3	DIA-0300-20-M2	DIA-0300-28-M2
3.05	7	3.5	3	DIA-0305-20-M2	DIA-0305-28-M2
3.10	8	4.5	4	DIA-0310-20-M2	DIA-0310-28-M2
3.20	8	4.5	4	DIA-0320-20-M2	DIA-0320-28-M2
3.25	8	4.5	4	DIA-0325-20-M2	
3.30	8	4.5	4	DIA-0330-20-M2	DIA-0330-28-M2
3.40	8	4.5	4	DIA-0340-20-M2	DIA-0340-28-M2
3.50	8	4.5	4	DIA-0350-20-M2	DIA-0350-28-M2
3.60	8	4.5	4	DIA-0360-20-M2	DIA-0360-28-M2
3.70	8	4.5	4	DIA-0370-20-M2	DIA-0370-28-M2
3.75	8	4.5	4	DIA-0375-20-M2	DIA-0375-28-M2
3.80	8	4.5	4	DIA-0380-20-M2	DIA-0380-28-M2
3.90	8	4.5	4	DIA-0390-20-M2	DIA-0390-28-M2
4.00	8	4.5	4	DIA-0400-20-M2	DIA-0400-28-M2
4.10	10	5.5	4	DIA-0410-20-M2	DIA-0410-28-M2
4.20	10	5.5	4	DIA-0420-20-M2	DIA-0420-28-M2
4.25	10	5.5	4	DIA-0425-20-M2	
4.30	10	5.5	4	DIA-0430-20-M2	DIA-0430-28-M2
4.40	10	5.5	4	DIA-0440-20-M2	DIA-0440-28-M2
4.50	10	5.5	4	DIA-0450-20-M2	DIA-0450-28-M2
4.60	10	5.5	4	DIA-0460-20-M2	DIA-0460-28-M2
4.70	10	5.5	4	DIA-0470-20-M2	DIA-0470-28-M2
4.75	10	5.5	4	DIA-0475-20-M2	
4.80	10	5.5	4	DIA-0480-20-M2	DIA-0480-28-M2
4.90	10	5.5	4	DIA-0490-20-M2	DIA-0490-28-M2
5.00	12	6.5	4	DIA-0500-20-M2	DIA-0500-28-M2

Material: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc.
Head Hardness: 45 +/- 5 Hrc.

DIA d1	DIA d3	A	I3	A2	
				20	28
1.00	6	2.5	2		DIA-0100-28-A2
1.05	6	2.5	2		DIA-0105-28-A2
1.10	6	2.5	2		DIA-0110-28-A2
1.20	6	2.5	2		DIA-0110-28-A2
1.30	6	2.5	2		DIA-0120-28-A2
1.40	6	2.5	2		DIA-0130-28-A2
1.50	6	2.5	2		DIA-0140-28-A2
1.60	6	2.5	2		DIA-0150-28-A2
1.70	6	2.5	2		DIA-0160-28-A2
1.75	6	2.5	2		DIA-0170-28-A2
1.80	6	2.5	2		DIA-0175-28-A2
1.90	7	2.5	2		DIA-0180-28-A2
2.00	7	2.5	2		DIA-0200-28-A2
2.10	7	3.5	3		DIA-0210-28-A2
2.20	7	3.5	3		DIA-0220-28-A2
2.25	7	3.5	3		DIA-0225-28-A2
2.30	7	3.5	3		DIA-0230-28-A2
2.40	7	3.5	3		DIA-0240-28-A2
2.50	7	3.5	3		DIA-0250-28-A2
2.60	7	3.5	3		DIA-0260-28-A2
2.70	7	3.5	3		DIA-0270-28-A2
2.75	7	3.5	3		DIA-0275-28-A2
2.80	7	3.5	3		DIA-0280-28-A2
2.90	7	3.5	3		DIA-0290-28-A2
3.00	7	3.5	3		DIA-0300-28-A2
3.05	7	3.5	3		DIA-0305-28-A2
3.10	7	3.5	3		DIA-0310-28-A2
3.20	7	3.5	3		DIA-0320-28-A2
3.25	7	3.5	3		DIA-0325-28-A2
3.30	7	3.5	3		DIA-0330-28-A2
3.40	8	4.5	4		DIA-0340-28-M2
3.50	8	4.5	4		DIA-0350-28-M2
3.60	8	4.5	4		DIA-0360-28-M2
3.70	8	4.5	4		DIA-0370-28-M2
3.75	8	4.5	4		DIA-0375-28-M2
3.80	8	4.5	4		DIA-0380-28-M2
3.90	8	4.5	4		DIA-0390-28-M2
4.00	8	4.5	4		DIA-0400-28-A2
4.10	10	5.5	4		DIA-0410-28-A2
4.20	10	5.5	4		DIA-0420-28-A2
4.30	10	5.5	4		DIA-0430-28-A2
4.40	10	5.5	4		DIA-0440-28-A2
4.50	10	5.5	4		DIA-0450-28-A2
4.60	10	5.5	4		DIA-0460-28-A2
4.70	10	5.5	4		DIA-0470-28-A2
4.75	10	5.5	4		DIA-0475-20-A2
4.80	10	5.5	4		DIA-0480-28-A2
4.90	10	5.5	4		DIA-0490-28-A2
5.00	12	6.5	4		DIA-0500-28-A2



Tolerance
d1 = H8
d3 = n6



Material: (HSS) M2 Tungsten High Speed Steel
Shank Hardness: 64 +/- 2 Hrc.
Head Hardness: 50 +/- 5 Hrc.

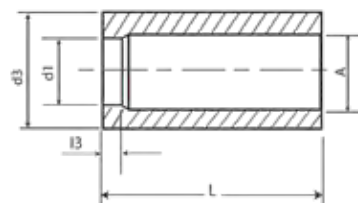
DIA d1	DIA d3	A	I3	HSS	
				20	28
5.10	12	6.5	4	DIA-0510-20-M2	DIA-0510-28-M2
5.20	12	6.5	4	DIA-0520-20-M2	DIA-0520-28-M2
5.25	12	6.5	4	DIA-0525-20-M2	
5.30	12	6.5	4	DIA-0530-20-M2	DIA-0530-28-M2
5.40	12	6.5	4	DIA-0540-20-M2	DIA-0540-28-M2
5.50	12	6.5	4	DIA-0550-20-M2	DIA-0550-28-M2
5.60	12	6.5	4	DIA-0560-20-M2	DIA-0560-28-M2
5.70	12	6.5	4	DIA-0570-20-M2	DIA-0570-28-M2
5.75	12	6.5	4	DIA-0575-20-M2	
5.80	12	6.5	4	DIA-0580-20-M2	DIA-0580-28-M2
5.90	12	6.5	4	DIA-0590-20-M2	DIA-0590-28-M2
6.00	12	6.5	4	DIA-0600-20-M2	DIA-0600-28-M2
6.10	15	7.5	4	DIA-0610-20-M2	DIA-0610-28-M2
6.20	15	7.5	4	DIA-0620-20-M2	DIA-0620-28-M2
6.25	15	7.5	4	DIA-0625-20-M2	
6.30	15	7.5	4	DIA-0630-20-M2	DIA-0630-28-M2
6.40	15	7.5	4	DIA-0640-20-M2	DIA-0640-28-M2
6.50	15	7.5	4	DIA-0650-20-M2	DIA-0650-28-M2
6.60	15	7.5	4	DIA-0660-20-M2	DIA-0660-28-M2
6.70	15	7.5	4	DIA-0670-20-M2	DIA-0670-28-M2
6.75	15	7.5	4	DIA-0675-20-M2	
6.80	15	7.5	4	DIA-0680-20-M2	DIA-0680-28-M2
6.90	15	7.5	4	DIA-0690-20-M2	DIA-0690-28-M2
7.00	15	7.5	4	DIA-0700-20-M2	DIA-0700-28-M2
7.10	15	7.5	4	DIA-0710-20-M2	DIA-0710-28-M2
7.20	15	7.5	4	DIA-0720-20-M2	DIA-0720-28-M2
7.25	15	7.5	4	DIA-0725-20-M2	
7.30	15	7.5	4	DIA-0730-20-M2	DIA-0730-28-M2
7.40	15	7.5	4	DIA-0740-20-M2	DIA-0740-28-M2
7.50	15	7.5	4	DIA-0750-20-M2	DIA-0750-28-M2
7.60	15	7.5	4	DIA-0760-20-M2	DIA-0760-28-M2
7.70	15	7.5	4	DIA-0770-20-M2	DIA-0770-28-M2
7.75	15	7.5	4	DIA-0775-20-M2	
7.80	15	7.5	4	DIA-0780-20-M2	DIA-0780-28-M2
7.90	15	7.5	4	DIA-0790-20-M2	DIA-0790-28-M2
8.00	15	7.5	4	DIA-0800-20-M2	DIA-0800-28-M2
8.10	18	9.5	4	DIA-0810-20-M2	DIA-0810-28-M2
8.20	18	9.5	4	DIA-0820-20-M2	DIA-0820-28-M2
8.25	18	9.5	4	DIA-0825-20-M2	
8.30	18	9.5	4	DIA-0830-20-M2	DIA-0830-28-M2
8.40	18	9.5	4	DIA-0840-20-M2	DIA-0840-28-M2
8.50	18	9.5	4	DIA-0850-20-M2	DIA-0850-28-M2
8.60	18	9.5	4	DIA-0860-20-M2	DIA-0860-28-M2
8.70	18	9.5	4	DIA-0870-20-M2	DIA-0870-28-M2
8.75	18	9.5	4	DIA-0875-20-M2	
8.80	18	9.5	4	DIA-0880-20-M2	DIA-0880-28-M2
8.90	18	9.5	4	DIA-0890-20-M2	DIA-0890-28-M2
9.00	18	9.5	4	DIA-0900-20-M2	DIA-0900-28-M2
9.10	18	9.5	4	DIA-0910-20-M2	DIA-0910-28-M2
9.20	18	9.5	4	DIA-0920-20-M2	DIA-0920-28-M2

Material: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc.
Head Hardness: 45 +/- 5 Hrc.

DIA d1	DIA d3	A	I3	A2	
				20	28
5.10	12	6.5	4		DIA-0510-28-A2
5.20	12	6.5	4		DIA-0520-28-A2
5.25	12	6.5	4		DIA-0525-20-A2
5.30	12	6.5	4		DIA-0530-28-A2
5.40	12	6.5	4		DIA-0540-28-A2
5.50	12	6.5	4		DIA-0550-28-A2
5.60	12	6.5	4		DIA-0560-28-A2
5.70	12	6.5	4		DIA-0570-28-A2
5.75	12	6.5	4		DIA-0575-28-A2
5.80	12	6.5	4		DIA-0580-28-A2
5.90	12	6.5	4		DIA-0590-28-A2
6.00	12	6.5	4		DIA-0600-28-A2
6.10	15	7.5	4		DIA-0610-28-A2
6.20	15	7.5	4		DIA-0620-28-A2
6.30	15	7.5	4		DIA-0630-28-A2
6.40	15	7.5	4		DIA-0640-28-A2
6.50	15	7.5	4		DIA-0650-28-A2
6.60	15	7.5	4		DIA-0660-28-A2
6.70	15	7.5	4		DIA-0670-28-A2
6.80	15	7.5	4		DIA-0690-28-M2
6.90	15	7.5	4		DIA-0690-28-M2
7.00	15	7.5	4		DIA-0700-28-A2
7.10	15	7.5	4		DIA-0710-28-A2
7.20	15	7.5	4		DIA-0720-28-A2
7.30	15	7.5	4		DIA-0730-28-A2
7.40	15	7.5	4		DIA-0740-28-A2
7.50	15	7.5	4		DIA-0750-28-A2
7.60	15	7.5	4		DIA-0760-28-A2
7.70	15	7.5	4		DIA-0770-28-A2
7.80	15	7.5	4		DIA-0790-28-A2
7.90	15	7.5	4		DIA-0790-28-A2
8.00	15	7.5	4		DIA-0800-28-A2
8.10	18	9.5	4		DIA-0810-28-A2
8.20	18	9.5	4		DIA-0820-28-A2
8.30	18	9.5	4		DIA-0830-28-A2
8.40	18	9.5	4		DIA-0840-28-A2
8.50	18	9.5	4		DIA-0850-28-A2
8.60	18	9.5	4		DIA-0860-28-A2
8.70	18	9.5	4		DIA-0870-28-A2
8.80	18	9.5	4		DIA-0880-28-A2
8.90	18	9.5	4		DIA-0890-28-A2
9.00	18	9.5	4		DIA-0900-28-A2
9.10	18	9.5	4		DIA-0910-28-A2
9.20	18	9.5	4		DIA-0920-28-A2



Tolerance
d1 = H8
d3 = n6



Material: (HSS) M2 Tungsten High Speed Steel
Shank Hardness: 64 +/- 2 Hrc.
Head Hardness: 50 +/- 5 Hrc.

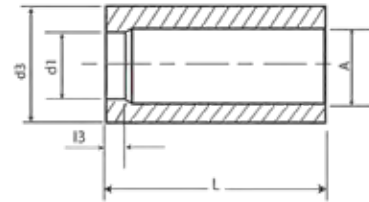
Material: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc.
Head Hardness: 45 +/- 5 Hrc.

DIA d1	DIA d3	A	I3	HSS	
				20	28
9.25	18	9.5	4	DIA-0925-20-M2	
9.30	18	9.5	4	DIA-0930-20-M2	DIA-0930-28-M2
9.40	18	9.5	4	DIA-0940-20-M2	DIA-0940-28-M2
9.50	18	9.5	4	DIA-0950-20-M2	DIA-0950-28-M2
9.60	18	9.5	4	DIA-0960-20-M2	DIA-0960-28-M2
9.70	18	9.5	4	DIA-0970-20-M2	DIA-0970-28-M2
9.75	18	9.5	4	DIA-0975-20-M2	
9.80	18	9.5	4	DIA-0980-20-M2	DIA-0980-28-M2
9.90	18	9.5	4	DIA-0990-20-M2	DIA-0990-28-M2
10.00	18	9.5	4	DIA-1000-20-M2	DIA-1000-28-M2
10.10	22	12	4	DIA-1010-20-M2	DIA-1010-28-M2
10.20	22	12	4	DIA-1020-20-M2	DIA-1020-28-M2
10.25	22	12	4		DIA-1025-28-M2
10.30	22	12	4	DIA-1030-20-M2	DIA-1030-28-M2
10.40	22	12	4	DIA-1040-20-M2	DIA-1040-28-M2
10.50	22	12	4	DIA-1050-20-M2	DIA-1050-28-M2
10.60	22	12	4	DIA-1060-20-M2	DIA-1060-28-M2
10.70	22	12	4	DIA-1070-20-M2	DIA-1070-28-M2
10.80	22	12	4	DIA-1080-20-M2	DIA-1080-28-M2
10.90	22	12	4	DIA-1090-20-M2	DIA-1090-28-M2
11.00	22	12	4	DIA-1100-20-M2	DIA-1100-28-M2
11.10	22	12	4	DIA-1110-20-M2	DIA-1110-28-M2
11.20	22	12	4	DIA-1120-20-M2	DIA-1120-28-M2
11.30	22	12	4	DIA-1130-20-M2	DIA-1130-28-M2
11.40	22	12	4	DIA-1140-20-M2	DIA-1140-28-M2
11.50	22	12	4	DIA-1150-20-M2	DIA-1150-28-M2
11.60	22	12	4	DIA-1160-20-M2	DIA-1160-28-M2
11.70	22	12	4	DIA-1170-20-M2	DIA-1170-28-M2
11.80	22	12	4	DIA-1180-20-M2	DIA-1180-28-M2
11.90	22	12	4	DIA-1190-20-M2	DIA-1190-28-M2
12.00	22	12	4	DIA-1200-20-M2	DIA-1200-28-M2
12.10	26	14	4	DIA-1210-20-M2	DIA-1210-28-M2
12.20	26	14	4	DIA-1220-20-M2	DIA-1220-28-M2
12.30	26	14	4	DIA-1230-20-M2	DIA-1230-28-M2
12.40	26	14	4	DIA-1240-20-M2	DIA-1240-28-M2
12.50	26	14	4	DIA-1250-20-M2	DIA-1250-28-M2
12.60	26	14	4	DIA-1260-20-M2	DIA-1260-28-M2
12.70	26	14	4	DIA-1270-20-M2	DIA-1270-28-M2
12.80	26	14	4	DIA-1280-20-M2	DIA-1280-28-M2
12.90	26	14	4	DIA-1290-20-M2	DIA-1290-28-M2
13.00	26	14	4	DIA-1300-20-M2	DIA-1300-28-M2
13.10	26	14	4	DIA-1310-20-M2	DIA-1310-28-M2
13.20	26	14	4	DIA-1320-20-M2	DIA-1320-28-M2
13.30	26	14	4	DIA-1330-20-M2	DIA-1330-28-M2
13.40	26	14	4	DIA-1340-20-M2	DIA-1340-28-M2
13.50	26	14	4	DIA-1350-20-M2	DIA-1350-28-M2
13.60	26	14	4	DIA-1360-20-M2	DIA-1360-28-M2
13.70	26	14	4	DIA-1370-20-M2	DIA-1370-28-M2
13.80	26	14	4	DIA-1380-20-M2	DIA-1380-28-M2
13.90	26	14	4	DIA-1390-20-M2	DIA-1390-28-M2

DIA d1	DIA d3	A	I3	A2	
				28	
9.30	18	9.5	4	DIA-0930-28-A2	
9.40	18	9.5	4	DIA-0940-28-A2	
9.50	18	9.5	4	DIA-0950-28-A2	
9.60	18	9.5	4	DIA-0960-28-A2	
9.70	18	9.5	4	DIA-0970-28-A2	
9.80	18	9.5	4	DIA-0980-28-A2	
9.90	18	9.5	4	DIA-0990-28-A2	
10.00	18	9.5	4	DIA-1000-28-A2	
10.10	22	12	4	DIA-1010-28-A2	
10.20	22	12	4	DIA-1020-28-A2	
10.30	22	12	4	DIA-1030-28-A2	
10.40	22	12	4	DIA-1040-28-A2	
10.50	22	12	4	DIA-1050-28-A2	
10.60	22	12	4	DIA-1060-28-A2	
10.70	22	12	4	DIA-1070-28-A2	
10.80	22	12	4	DIA-1080-28-A2	
10.90	22	12	4	DIA-1090-28-A2	
11.00	22	12	4	DIA-1100-28-A2	
11.10	22	12	4	DIA-1110-28-A2	
11.20	22	12	4	DIA-1120-28-A2	
11.30	22	12	4	DIA-1130-28-A2	
11.40	22	12	4	DIA-1140-28-A2	
11.50	22	12	4	DIA-1150-28-A2	
11.60	22	12	4	DIA-1160-28-A2	
11.70	22	12	4	DIA-1170-28-A2	
11.80	22	12	4	DIA-1180-28-A2	
11.90	22	12	4	DIA-1190-28-A2	
12.00	22	12	4	DIA-1200-28-A2	
12.10	26	14	4	DIA-1210-28-A2	
12.20	26	14	4	DIA-1220-28-A2	
12.30	26	14	4	DIA-1230-28-A2	
12.40	26	14	4	DIA-1240-28-A2	
12.50	26	14	4	DIA-1250-28-A2	
12.60	26	14	4	DIA-1260-28-A2	
12.70	26	14	4	DIA-1270-28-A2	
12.80	26	14	4	DIA-1280-28-A2	
12.90	26	14	4	DIA-1290-28-A2	
13.00	26	14	4	DIA-1300-28-A2	
13.10	26	14	4	DIA-1310-28-A2	
13.20	26	14	4	DIA-1320-28-A2	
13.30	26	14	4	DIA-1330-28-A2	
13.40	26	14	4	DIA-1340-28-A2	
13.50	26	14	4	DIA-1350-28-A2	
13.60	26	14	4	DIA-1360-28-A2	
13.70	26	14	4	DIA-1370-28-A2	
13.80	26	14	4	DIA-1380-28-A2	
13.90	26	14	4	DIA-1390-28-A2	



Tolerance
d1 = H8
d3 = n6



Material: (HSS) M2 Tungsten High Speed Steel
Shank Hardness: 64 +/- 2 Hrc.
Head Hardness: 50 +/- 5 Hrc.

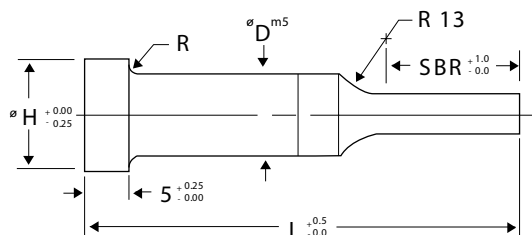
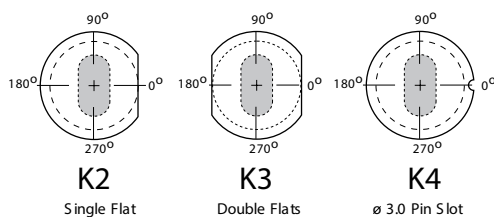
Material: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc.
Head Hardness: 45 +/- 5 Hrc.

DIA d1	DIA d3	A	l3	HSS	
				20	28
14.00	26	14	4	DIA-1400-20-M2	DIA-1400-28-M2
14.10	26	16	4	DIA-1410-20-M2	DIA-1410-28-M2
14.20	26	16	4	DIA-1420-20-M2	DIA-1420-28-M2
14.30	26	16	4	DIA-1430-20-M2	DIA-1430-28-M2
14.40	26	16	4	DIA-1440-20-M2	DIA-1440-28-M2
14.50	26	16	4	DIA-1450-20-M2	DIA-1450-28-M2
14.60	26	16	4	DIA-1460-20-M2	DIA-1460-28-M2
14.70	26	16	4	DIA-1470-20-M2	DIA-1470-28-M2
14.80	26	16	4	DIA-1480-20-M2	DIA-1480-28-M2
14.90	26	16	4	DIA-1490-20-M2	DIA-1490-28-M2
15.00	26	16	4	DIA-1500-20-M2	DIA-1500-28-M2
16.10	26	16	4		DIA-1610-28-M2

DIA d1	DIA d3	A	l3	A2	
				28	
14.00	26	14	4	DIA-1400-28-A2	
14.10	26	16	4	DIA-1410-28-A2	
14.20	26	16	4	DIA-1420-28-A2	
14.30	26	16	4	DIA-1430-28-A2	
14.40	26	16	4	DIA-1440-28-A2	
14.50	26	16	4	DIA-1450-28-A2	
14.60	26	16	4	DIA-1460-28-A2	
14.70	26	16	4	DIA-1470-28-A2	
14.80	26	16	4	DIA-1480-28-A2	
14.90	26	16	4	DIA-1490-28-A2	
15.00	26	16	4	DIA-1500-28-A2	
16.10	26	16	4		

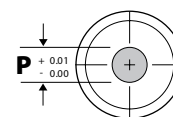
R =  O =  S =  H = 

Key-Flats in Die Position



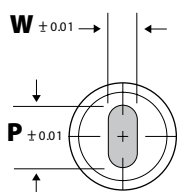
HGPSR

Round



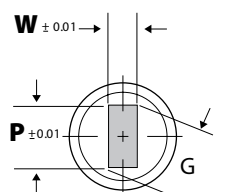
GPSO

Oblong



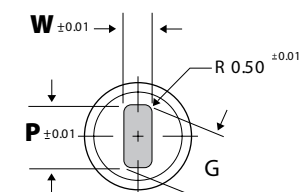
GPSS

Square/rect

Diagonal "G" = $\sqrt{P^2 + W^2}$

GPSH

High production

G $(\sqrt{(P-1.0)^2 + (W-1.0)^2}) + 1.0$

Ordering Example

HGPSR 13-13-71-M2 P10.1

HGPSO 20-19-80 M2 P18.2 W9.5 K2

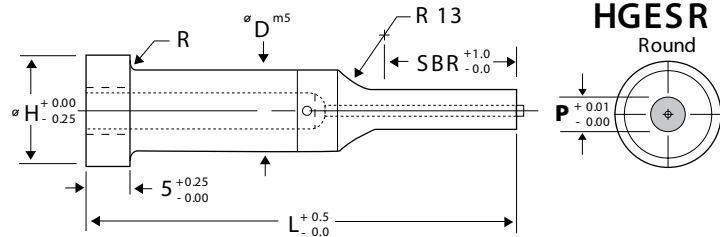
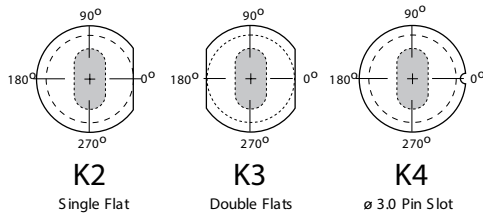
A2 = R/c 59-61 double tempered
 M2 = R/c 61-63 triple tempered
 Heads drawn to Rc 40-55

Round P to D	0.01	
Shape P & W to D	0.02	

Type	D	Point length SBR						Overall Length							Round P min.	Shape W min.	Head Dia. H
		8	10	13	19	25	32	50	56	63	71	80	90	100			
HGPS_	4	8	10					50	56	63					0.8	0.8	7
HGPS_	5	8	10	13				50	56	63	71				1.3	1.3	8
HGPS_	6	8	10	13				50	56	63	71	80			1.4	1.4	9
HGPS_	8	8	10	13				50	56	63	71	80			1.5	1.5	11
HGPS_	10		10	13				50	56	63	71	80	90	100	1.9	1.9	13
HGPS_	13		10	13	19			50	56	63	71	80	90	100	3.1	3.1	16
HGPS_	16			13	19	25		50	56	63	71	80	90	100	5.7	5.7	19
HGPS_	20			13	19	25			56	63	71	80	90	100	5.7	5.7	24
HGPS_	25			13	19	25			56	63	71	80	90	100	5.7	5.7	29
HGPS_	32				19	25					71	80	90	100	9.9	9.9	36
HGPS_	40				19	25	32				71	80	90	100	12.0	12.0	45
HGPS_	45					25	32					80	90	100	14.0	14.0	50
HGPS_	50					25	32					80	90	100	16.0	16.0	55
HGPS_	56					25	32					80	90	100	18.0	18.0	61
HGPS_	63					25	32					80	90	100	20.0	20.0	68

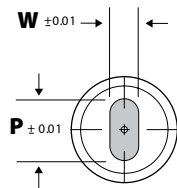
R = O = S = H =

Key-Flats in Die Position



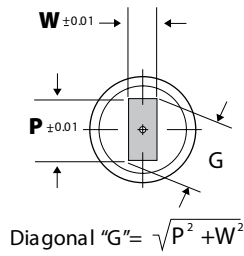
HGESO

Oblong



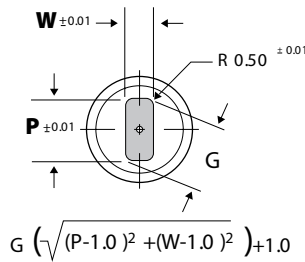
HGESS

Square/rect



HGESH

High production



Ordering Example

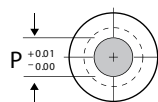
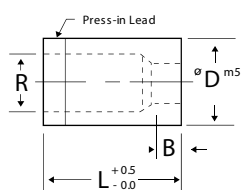
HGERS 13-13-71-M2 P10.1

HGESO20-19-80 M2 P18.2 W9.5 K2

A2 = R/c 59-61 double tempered
M2 = R/c 61-63 triple tempered
Heads drawn to Rc 40-55

Round P to D	0.01	
Shape P & W to D	0.02	

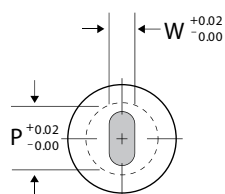
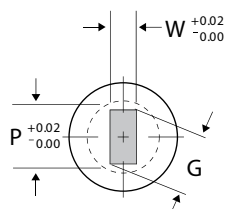
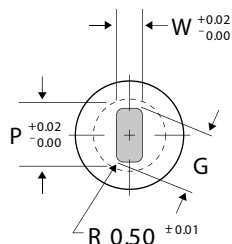
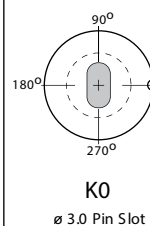
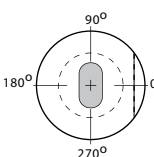
Type	D	Point length SBR						Overall Length							Round P min.	Shape W min.	Head Dia. H
		8	10	13	19	25	32	50	56	63	71	80	90	100			
HGES_	5	8	10	13				50	56	63	71				1.9	1.9	8
HGES_	6	8	10	13				50	56	63	71	80			2	2	9
HGES_	8	8	10	13				50	56	63	71	80			2.9	2.9	11
HGES_	10		10	13	19			50	56	63	71	80	90	100	4	4	13
HGES_	13		10	13	19			50	56	63	71	80	90	100	4	4	16
HGES_	16			13	19	25		50	56	63	71	80	90	100	5.7	5.7	19
HGES_	20			13	19	25			56	63	71	80	90	100	5.7	5.7	24
HGES_	25			13	19	25			56	63	71	80	90	100	5.7	5.7	29
HGES_	32				19	25	32				71	80	90	100	9.9	9.9	36
HGES_	40				19	25	32					80	90	100	12	12	45
HGES_	45					25	32					80	90	100	14	14	50
HGES_	50					25	32					80	90	100	16	16	55
HGES_	56					25	32					80	90	100	18	18	61
HGES_	63					25	32					80	90	100	20	20	68

R = ○ O =  S =  H = **HGBPR**
RoundP to D 0.01 **Ordering Example**

HGBPR 13-28 A2 P4.5

A2 = R/c 59-61 double tempered

Type	D	L and B		Overall Length L							Point Range P	Max. R
				20	22	25	28	30	32	35		
HGBPR	8	4	8	20	22	25	28	30	32	35	1.5 - 3.2	4
HGBPR	10	4	8	20	22	25	28	30	32	35	1.5 - 5.0	5.8
HGBPR	13	5	8	20	22	25	28	30	32	35	3 - 7.2	8
HGBPR	16	5	8	20	22	25	28	30	32	35	5 - 8.8	9.5
HGBPR	20	6	12	20	22	25	28	30	32	35	7.0 - 11.0	11.9
HGBPR	22	6	12	20	22	25	28	30	32	35	9.0 - 13.8	14.7
HGBPR	25	6	12	20	22	25	28	30	32	35	11.0 - 16.5	17.4
HGBPR	32	8	12	20	22	25	28	30	32	35	13.0 - 19.8	20.6
HGBPR	38	8	12	20	22	25	28	30	32	35	16.0 - 26.0	27

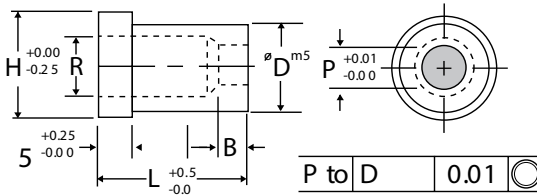
HGBPO
Oblong**HGBPS**
Square/Rectangle**HGBPH**
High ProductionP & W to D 0.02 Diagonal "G" = $\sqrt{P^2 + W^2}$ $G = (\sqrt{(P - 1.0)^2 + (W - 1.0)^2}) + 1.0$ **Key-Flats in Die Position**K0
ø 3.0 Pin SlotK2
Single Flat

HGBPO16-20 A2 P6.9 W4.3 K2

Type	D	L and B		Overall Length L							Min. W	Min. P/G	Max.R
				20	22	25	28	30	32	35			
HGBP_	10	4	8	20	22	25	28	30	32	35	1.2	5	5.8
HGBP_	13	5	8	20	22	25	28	30	32	35	2	7.2	8
HGBP_	16	5	8	20	22	25	28	30	32	35	2.4	8.8	9.5
HGBP_	20	6	12	20	22	25	28	30	32	35	3.2	11	11.9
HGBP_	22	6	12	20	22	25	28	30	32	35	4	13.8	14.7
HGBP_	25	6	12	20	22	25	28	30	32	35	4.8	16.5	17.4
HGBP_	32	8	12	20	22	25	28	30	32	35	5.5	19.8	20.6
HGBP_	38	8	12	20	22	25	28	30	32	35	6.4	26	27

R = ○ O =  S =  H = 

HGBSR Round



Ordering Example

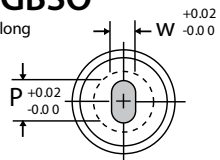
HGBSR 13-28 A2 P4.5

A2 = R/c 59-61 double tempered

Type	D	L and B	Overall Length L							Point Range P	Max. R	Head Dia. H
			20	22	25	28	30	32	35			
HGBSR	10	4	20	22	25	28	30	32	35	1.5 - 5.0	5.8	13
HGBSR	13	5	20	22	25	28	30	32	35	3.0 - 7.2	8	16
HGBSR	16	5	20	22	25	28	30	32	35	5.0 - 8.8	9.5	19
HGBSR	20	5	20	22	25	28	30	32	35	7.0 - 11.0	11.9	24
HGBSR	22	6	20	22	25	28	30	32	35	9.0 - 13.8	14.7	26
HGBSR	25	6	20	22	25	28	30	32	35	11.0 - 16.5	17.4	29
HGBSR	32	6	20	22	25	28	30	32	35	13.0 - 19.8	20.6	36
HGBSR	38	8	20	22	25	28	30	32	35	16.0 - 26.0	27	42

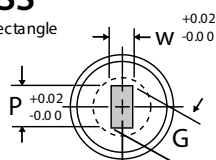
HGBSO

Oblong



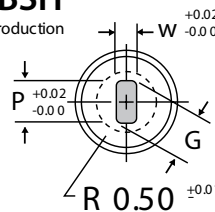
HGBSS

Square/Rectangle



HGBSH

High production



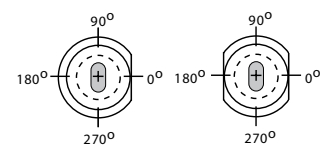
P & W to D 0.02

Diagonal "G" = $\sqrt{P^2 + W^2}$

$G = (\sqrt{(P-1.0)^2 + (W-1.0)^2}) + 1.0$

HGBSO 16-20 A2 P6.9 W4.3 K2

Key-Flats in Die Position

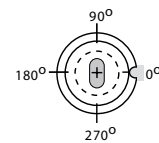


K2

single flat

K3

double flat



K4

3.0 diameter pin slot

Type	D	L and B	Overall Length L							Min. W	Min. P/G	Max.R	Head Dia. H
			20	22	25	28	30	32	35				
HGBS_	10	4	20	22	25	28	30	32	35	1.2	5	5.8	13
HGBS_	13	5	20	22	25	28	30	32	35	2	7.2	8	16
HGBS_	16	5	20	22	25	28	30	32	35	2.4	8.8	9.5	19
HGBS_	20	5	20	22	25	28	30	32	35	3.2	11	11.9	24
HGBS_	22	6	20	22	25	28	30	32	35	4	13.8	14.7	26
HGBS_	25	6	20	22	25	28	30	32	35	4.8	16.5	17.4	29
HGBS_	32	6	20	22	25	28	30	32	35	5.5	19.8	20.6	36
HGBS_	38	8	20	22	25	28	30	32	35	6.4	26	27	42

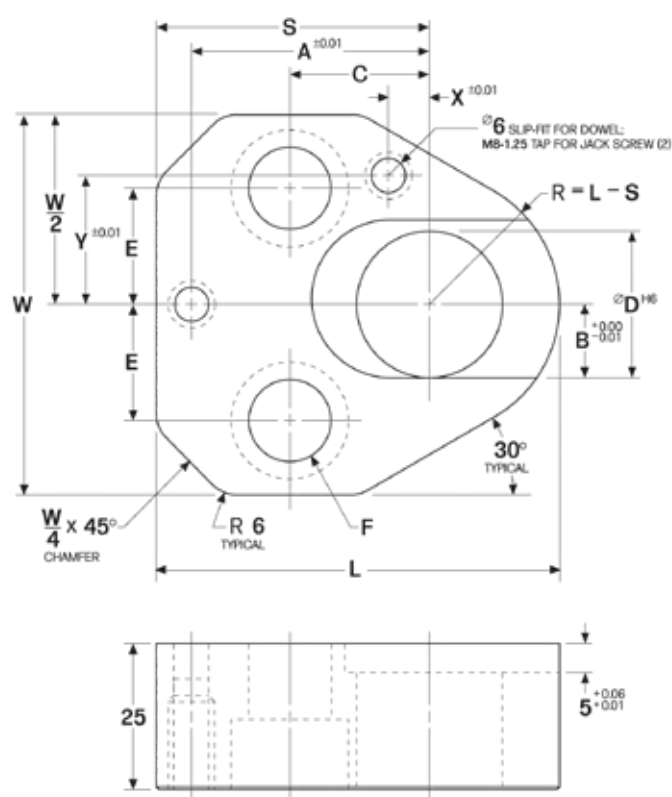


Retainer Set Includes:
 2 socket head cap screws
 2 vented and tapped dowels

A Speedy Solution for Round Punches and Pilots: (Dowels are finished and retainer ready for CNC mounting.

Counter-bore is sized to accept shoulder/headed punches.

Also, the dowel holes are tapped for easy removal in confined spaces.

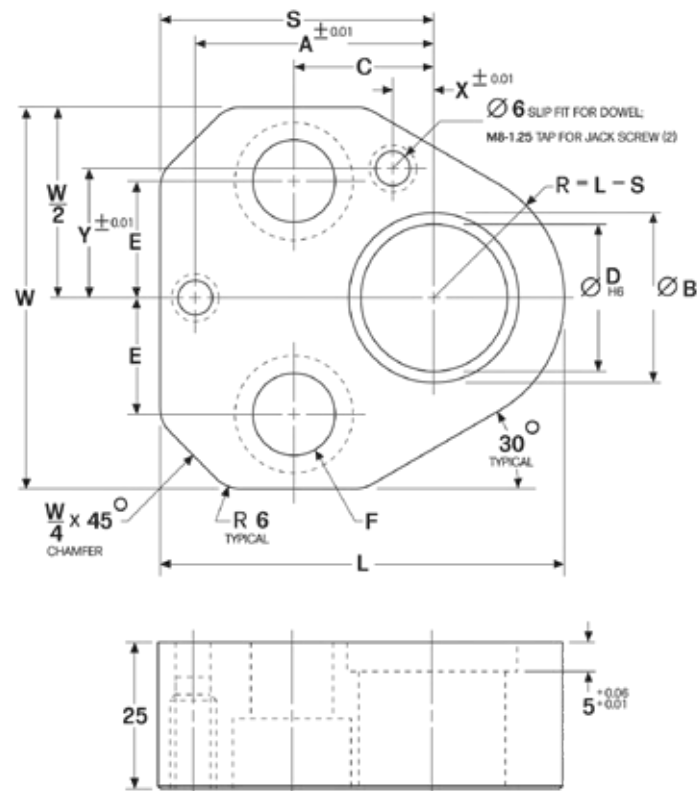


Product Code	D	W	L	B	S	A	C	E	X	Y	F
PRSF10	10	41.0	43.5	5.0	34.0	26.924	19.05	11.12	7.5	9.0	M8
PRSF13	13	48.5	49.6	6.5	37.0	29.972	19.05	14.27	6.5	12.0	M8
PRSF16	16	51.7	52.7	8.0	38.6	31.750	19.05	15.87	6.0	13.5	M8
PRSF20	20	56.8	59.3	10.0	41.9	33.528	19.05	17.47	5.0	16.5	M10
PRSF25	25	64.5	68.9	12.5	46.7	40.640	23.82	19.84	7.0	22.0	M12
PRSF32	32	64.5	68.9	16.0	46.7	40.640	23.82	19.84	7.0	22.0	M12



Retainer Set Includes:
2 socket head cap screws
2 vented and tapped dowels

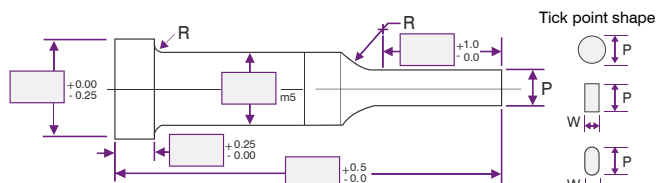
A Speedy Solution for Round Punches and Pilots: (Dowels are finished and retainer ready for CNC mounting.
Counter-bore is sized to accept shoulder/headed punches.
Also, the dowel holes are tapped for easy removal in confined spaces.



Product Code	D	W	L	B	S	A	C	E	X	Y	F
PRSR10	10	41.0	43.5	14.0	34.0	26.924	19.05	11.12	7.5	9.0	M8
PRSR13	13	48.5	49.6	17.0	37.0	29.972	19.05	14.27	6.5	12.0	M8
PRSR16	16	51.7	52.7	20.0	38.6	31.750	19.05	15.87	6.0	13.5	M8
PRSR20	20	56.8	59.3	24.0	41.9	33.528	19.05	17.47	5.0	16.5	M10
PRSR25	25	64.5	68.9	29.0	46.7	40.640	23.82	19.84	7.0	22.0	M12
PRSR32	32	64.5	68.9	36.0	46.7	40.640	23.82	19.84	7.0	22.0	M12

IMPORTANT: Please make sure all dimension boxes are filled in.

Solid Punch



P=	W=	Qty=
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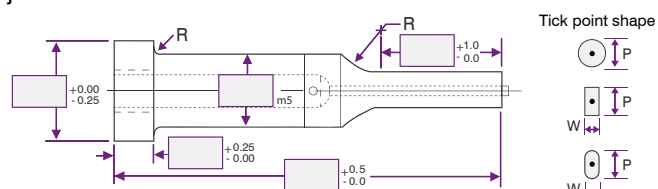
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P=	W=	Qty=
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Please tick the material required below

MAT Type ☐ HSS ☐ Toolsteel ☐

Ejector Punch



P=	W=	Qty=
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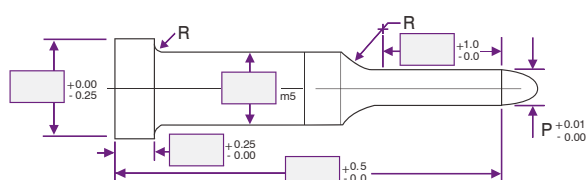
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P=	W=	Qty=
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Please tick the material required below

MAT Type ☐ HSS ☐ Toolsteel ☐

Parabolic Pilot



P=	Qty=
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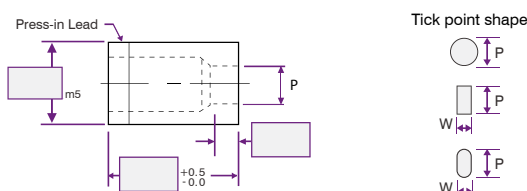
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P=	Qty=
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Please tick the material required below

MAT Type ☐ HSS ☐ Toolsteel ☐

Die Button Press Fit



P=	W=	Qty=
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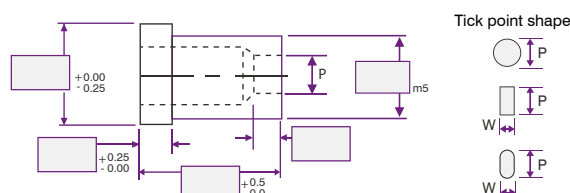
P=	W=	Qty=
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P=	W=	Qty=
----	----	------

Please tick the material required below

MAT Type ☐ HSS ☐ Toolsteel ☐

Die Button Shoulder



P=	W=	Qty=
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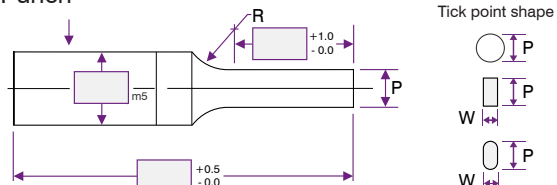
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P=	W=	Qty=
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Please tick the material required below

MAT Type ☐ HSS ☐ Toolsteel ☐

Headless Punch



P=	W=	Qty=
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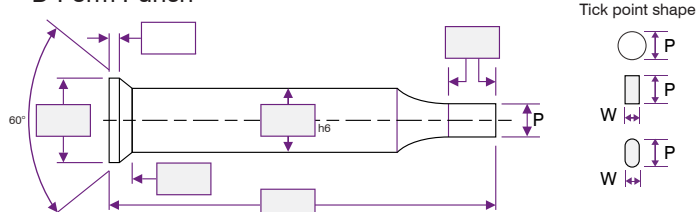
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P=	W=	Qty=
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Please tick the material required below

MAT Type ☐ HSS ☐ Toolsteel ☐

D-Form Punch



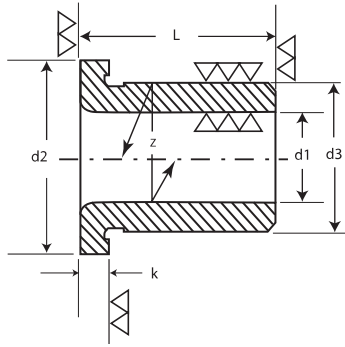
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P=	W=	Qty=
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P=	W=	Qty=
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Please tick the material required below

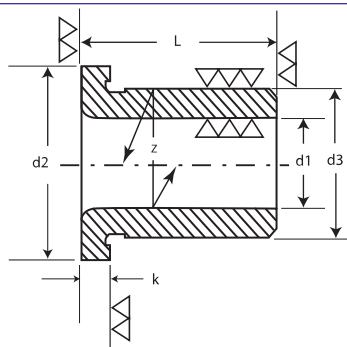
MAT Type ☐ HSS ☐ Toolsteel ☐



Materials: Case Hardened Steel
Hardness: 62 +/- 2 Hrc



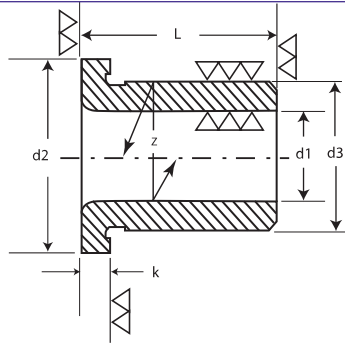
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0.5	3.0	6	2	0.01	DG172-005-3-6S	6	DG172-005-3-9L	9
0.6	3.0	6	2	0.01	DG172-006-3-6S	6	DG172-006-3-9L	9
0.7	3.0	6	2	0.01	DG172-007-3-6S	6	DG172-007-3-9L	9
0.8	3.0	6	2	0.01	DG172-008-3-6S	6	DG172-008-3-9L	9
0.9	3.0	6	2	0.01	DG172-009-3-6S	6	DG172-009-3-9L	9
1.0	3.0	6	2	0.01	DG172-010-3-6S	6	DG172-010-3-9L	9
1.1	4.0	7	2	0.01	DG172-011-4-6S	6	DG172-011-4-9L	9
1.2	4.0	7	2	0.01	DG172-012-4-6S	6	DG172-012-4-9L	9
1.3	4.0	7	2	0.01	DG172-013-4-6S	6	DG172-013-4-9L	9
1.4	4.0	7	2	0.01	DG172-014-4-6S	6	DG172-014-4-9L	9
1.5	4.0	7	2	0.01	DG172-015-4-6S	6	DG172-015-4-9L	9
1.6	4.0	7	2	0.01	DG172-016-4-6S	6	DG172-016-4-9L	9
1.7	4.0	7	2	0.01	DG172-017-4-6S	6	DG172-017-4-9L	9
1.8	4.0	7	2	0.01	DG172-018-4-6S	6	DG172-018-4-9L	9
1.9	5.0	8	2	0.01	DG172-019-5-6S	6	DG172-019-5-9L	9
2.0	5.0	8	2	0.01	DG172-020-5-6S	6	DG172-020-5-9L	9
2.1	5.0	8	2	0.01	DG172-021-5-6S	6	DG172-021-5-9L	9
2.2	5.0	8	2	0.01	DG172-022-5-6S	6	DG172-022-5-9L	9
2.3	5.0	8	2	0.01	DG172-023-5-6S	6	DG172-023-5-9L	9
2.4	5.0	8	2	0.01	DG172-024-5-6S	6	DG172-024-5-9L	9
2.5	5.0	8	2	0.01	DG172-025-5-6S	6	DG172-025-5-9L	9
2.6	5.0	8	2	0.01	DG172-026-5-6S	6	DG172-026-5-9L	9
2.7	6.0	10	2S/3L	0.01	DG172-027-6-8S	8	DG172-027-6-12L	12
2.8	6.0	10	2S/3L	0.01	DG172-028-6-8S	8	DG172-028-6-12L	12
2.9	6.0	10	2S/3L	0.01	DG172-029-6-8S	8	DG172-029-6-12L	12
3.0	6.0	10	2S/3L	0.01	DG172-030-6-8S	8	DG172-030-6-12L	12
3.1	6.0	10	2S/3L	0.01	DG172-031-6-8S	8	DG172-031-6-12L	12
3.2	6.0	10	2S/3L	0.01	DG172-032-6-8S	8	DG172-032-6-12L	12
3.3	6.0	10	2S/3L	0.01	DG172-033-6-8S	8	DG172-033-6-12L	12
3.4	7.0	11	2S/3L	0.01	DG172-034-7-8S	8	DG172-034-7-12L	12
3.5	7.0	11	2S/3L	0.01	DG172-035-7-8S	8	DG172-035-7-12L	12
3.6	7.0	11	2S/3L	0.01	DG172-036-7-8S	8	DG172-036-7-12L	12
3.7	7.0	11	2S/3L	0.01	DG172-037-7-8S	8	DG172-037-7-12L	12
3.8	7.0	11	2S/3L	0.01	DG172-038-7-8S	8	DG172-038-7-12L	12
3.9	7.0	11	2S/3L	0.01	DG172-039-7-8S	8	DG172-039-7-12L	12
4.0	7.0	11	2S/3L	0.01	DG172-040-7-8S	8	DG172-040-7-12L	12
4.0	8.0	12	2S/3L	0.01	DG172-040-8-8S	8		
4.1	8.0	12	2S/3L	0.01	DG172-041-8-8S	8	DG172-041-8-12L	12
4.2	8.0	12	2S/3L	0.01	DG172-042-8-8S	8	DG172-042-8-12L	12
4.3	8.0	12	2S/3L	0.01	DG172-043-8-8S	8	DG172-043-8-12L	12
4.4	8.0	12	2S/3L	0.01	DG172-044-8-8S	8	DG172-044-8-12L	12
4.5	8.0	12	2S/3L	0.01	DG172-045-8-8S	8	DG172-045-8-12L	12
4.6	8.0	12	2S/3L	0.01	DG172-046-8-8S	8	DG172-046-8-12L	12
4.7	8.0	12	2S/3L	0.01	DG172-047-8-8S	8	DG172-047-8-12L	12
4.8	8.0	12	2S/3L	0.01	DG172-048-8-8S	8	DG172-048-8-12L	12
4.9	8.0	12	2S/3L	0.01	DG172-049-8-8S	8	DG172-049-8-12L	12



Materials: Case Hardened Steel
Hardness: 62 +/- 2 Hrc



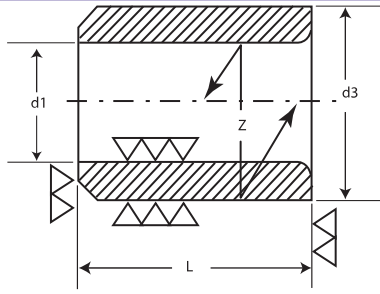
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5.1	10.0	14	3	0.02	DG172-051-10-10S	10	DG172-051-10-16L	16
5.2	10.0	14	3	0.02	DG172-052-10-10S	10	DG172-052-10-16L	16
5.3	10.0	14	3	0.02	DG172-053-10-10S	10	DG172-053-10-16L	16
5.4	10.0	14	3	0.02	DG172-054-10-10S	10	DG172-054-10-16L	16
5.5	10.0	14	3	0.02	DG172-055-10-10S	10	DG172-055-10-16L	16
5.6	10.0	14	3	0.02	DG172-056-10-10S	10	DG172-056-10-16L	16
5.7	10.0	14	3	0.02	DG172-057-10-10S	10	DG172-057-10-16L	16
5.8	10.0	14	3	0.02	DG172-058-10-10S	10	DG172-058-10-16L	16
6.0	10.0	14	3	0.02	DG172-060-10-10S	10	DG172-060-10-16L	16
6.1	12.0	16	3	0.02	DG172-061-12-10S	10	DG172-061-12-16L	16
6.2	12.0	16	3	0.02	DG172-062-12-10S	10	DG172-062-12-16L	16
6.3	12.0	16	3	0.02	DG172-063-12-10S	10	DG172-063-12-16L	16
6.4	12.0	16	3	0.02	DG172-064-12-10S	10	DG172-064-12-16L	16
6.5	12.0	16	3	0.02	DG172-065-12-10S	10	DG172-065-12-16L	16
6.6	12.0	16	3	0.02	DG172-066-12-10S	10	DG172-066-12-16L	16
6.7	12.0	16	3	0.02	DG172-067-12-10S	10	DG172-067-12-16L	16
6.8	12.0	16	3	0.02	DG172-068-12-10S	10	DG172-068-12-16L	16
6.9	12.0	16	3	0.02	DG172-069-12-10S	10	DG172-069-12-16L	16
7.0	12.0	16	3	0.02	DG172-070-12-10S	10	DG172-070-12-16L	16
7.1	12.0	16	3	0.02	DG172-071-12-10S	10	DG172-071-12-16L	16
7.2	12.0	16	3	0.02	DG172-072-12-10S	10	DG172-072-12-16L	16
7.3	12.0	16	3	0.02	DG172-073-12-10S	10	DG172-073-12-16L	16
7.4	12.0	16	3	0.02	DG172-074-12-10S	10	DG172-074-12-16L	16
7.5	12.0	16	3	0.02	DG172-075-12-10S	10	DG172-075-12-16L	16
7.6	12.0	16	3	0.02	DG172-076-12-10S	10	DG172-076-12-16L	16
7.7	12.0	16	3	0.02	DG172-077-12-10S	10	DG172-077-12-16L	16
7.8	12.0	16	3	0.02	DG172-078-12-10S	10	DG172-078-12-16L	16
7.9	12.0	16	3	0.02	DG172-079-12-10S	10	DG172-079-12-16L	16
8.0	12.0	16	3	0.02	DG172-080-12-10S	10	DG172-080-12-16L	16
8.0	15.0	19	4	0.02	DG172-080-15-12S	12	DG172-080-15-20L	20
8.1	15.0	19	4	0.02	DG172-081-15-12S	12	DG172-081-15-20L	20
8.2	15.0	19	4	0.02	DG172-082-15-12S	12	DG172-082-15-20L	20
8.3	15.0	19	4	0.02	DG172-083-15-12S	12	DG172-083-15-20L	20
8.4	15.0	19	4	0.02	DG172-084-15-12S	12	DG172-084-15-20L	20
8.5	15.0	19	4	0.02	DG172-085-15-12S	12	DG172-085-15-20L	20
8.6	15.0	19	4	0.02	DG172-086-15-12S	12	DG172-086-15-20L	20
8.7	15.0	19	4	0.02	DG172-087-15-12S	12	DG172-087-15-20L	20
8.8	15.0	19	4	0.02	DG172-088-15-12S	12	DG172-088-15-20L	20
8.9	15.0	19	4	0.02	DG172-089-15-12S	12	DG172-089-15-20L	20
9.0	15.0	19	4	0.02	DG172-090-15-12S	12	DG172-090-15-20L	20
9.1	15.0	19	4	0.02	DG172-091-15-12S	12	DG172-091-15-20L	20
9.2	15.0	19	4	0.02	DG172-092-15-12S	12	DG172-092-15-20L	20
9.3	15.0	19	4	0.02	DG172-093-15-12S	12	DG172-093-15-20L	20
9.4	15.0	19	4	0.02	DG172-094-15-12S	12	DG172-094-15-20L	20
9.5	15.0	19	4	0.02	DG172-095-15-12S	12	DG172-095-15-20L	20
9.6	15.0	19	4	0.02	DG172-096-15-12S	12	DG172-096-15-20L	20
9.7	15.0	19	4	0.02	DG172-097-15-12S	12	DG172-097-15-20L	20



Materials: Case Hardened Steel
Hardness: 62 +/- 2 Hrc



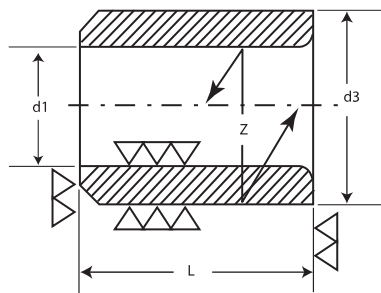
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9.9	15.0	19	4	0.02	DG172-099-15-12S	12	DG172-099-15-20L	20
10.0	15.0	19	4	0.02	DG172-100-15-12S	12	DG172-100-15-20L	20
10.1	18.0	22	4	0.02	DG172-101-18-12S	12	DG172-101-18-20L	20
10.2	18.0	22	4	0.02	DG172-102-18-12S	12	DG172-102-18-20L	20
10.3	18.0	22	4	0.02	DG172-103-18-12S	12	DG172-103-18-20L	20
10.4	18.0	22	4	0.02	DG172-104-18-12S	12	DG172-104-18-20L	20
10.5	18.0	22	4	0.02	DG172-105-18-12S	12	DG172-105-18-20L	20
10.6	18.0	22	4	0.02	DG172-106-18-12S	12	DG172-106-18-20L	20
10.7	18.0	22	4	0.02	DG172-107-18-12S	12	DG172-107-18-20L	20
10.8	18.0	22	4	0.02	DG172-108-18-12S	12	DG172-108-18-20L	20
10.9	18.0	22	4	0.02	DG172-109-18-12S	12	DG172-109-18-20L	20
11.0	18.0	22	4	0.02	DG172-110-18-12S	12	DG172-110-18-20L	20
11.1	18.0	22	4	0.02	DG172-111-18-12S	12	DG172-111-18-20L	20
11.2	18.0	22	4	0.02	DG172-112-18-12S	12	DG172-112-18-20L	20
11.3	18.0	22	4	0.02	DG172-113-18-12S	12	DG172-113-18-20L	20
11.4	18.0	22	4	0.02	DG172-114-18-12S	12	DG172-114-18-20L	20
11.5	18.0	22	4	0.02	DG172-115-18-12S	12	DG172-115-18-20L	20
11.6	18.0	22	4	0.02	DG172-116-18-12S	12	DG172-116-18-20L	20
11.7	18.0	22	4	0.02	DG172-117-18-12S	12	DG172-117-18-20L	20
11.8	18.0	22	4	0.02	DG172-118-18-12S	12	DG172-118-18-20L	20
11.9	18.0	22	4	0.02	DG172-119-18-12S	12	DG172-119-18-20L	20
12.0	18.0	22	4	0.02	DG172-120-18-12S	12	DG172-120-18-20L	20
12.0	22.0	26	4	0.02	DG172-120-22-16S	16		
12.5	22.0	26	4	0.02	DG172-125-22-16S	16	DG172-125-22-28L	28
13.0	22.0	26	4	0.02	DG172-130-22-16S	16	DG172-130-22-28L	28
13.5	22.0	26	4	0.02	DG172-135-22-16S	16	DG172-135-22-28L	28
14.0	22.0	26	4	0.02	DG172-140-22-16S	16	DG172-140-22-28L	28
14.5	22.0	26	4	0.02	DG172-145-22-16S	16	DG172-145-22-28L	28
15.0	22.0	26	4	0.02	DG172-150-22-16S	16	DG172-150-22-28L	28
15.5	26.0	30	4	0.02	DG172-155-26-16S	16	DG172-155-26-28L	28
16.0	26.0	30	4	0.02	DG172-160-26-16S	16	DG172-160-26-28L	28
16.5	26.0	30	4	0.02	DG172-165-26-16S	16	DG172-165-26-28L	28
17.0	26.0	30	4	0.02	DG172-170-26-16S	16	DG172-170-26-28L	28
18.0	26.0	30	4	0.02	DG172-180-26-16S	16	DG172-180-26-28L	28
18.5	30.0	35	6	0.02	DG172-185-30-20S	20	DG172-185-30-36L	36
19.0	30.0	35	6	0.02	DG172-190-30-20S	20	DG172-190-30-36L	36
19.5	30.0	35	6	0.02	DG172-195-30-20S	20	DG172-195-30-36L	36
20.0	30.0	35	6	0.02	DG172-200-30-20S	20	DG172-200-30-36L	36
21.0	30.0	35	6	0.02	DG172-210-30-20S	20	DG172-210-30-36L	36
22.0	30.0	35	6	0.02	DG172-220-30-20S	20	DG172-220-30-36L	36
23.0	35.0	40	5	0.02	DG172-230-30-20S	20	DG172-230-30-36L	36
24.0	35.0	40	5	0.02	DG172-240-30-20S	20	DG172-240-30-36L	36
25.0	35.0	40	5	0.02	DG172-250-30-20S	20	DG172-250-30-36L	36
26.0	35.0	40	5	0.02	DG172-260-30-20S	20	DG172-260-30-36L	36
30.0	42.0	47	5	0.02	DG172-300-42-20S	20	DG172-300-42-36L	36
32.0	48.0	55	5	0.04	DG172-320-48-25S	25	DG172-320-48-45L	45
35.0	48.0	55	5	0.04			DG172-350-48-45L	45



Materials: Case Hardened Steel
Hardness: 62 +/- 2 Hrc



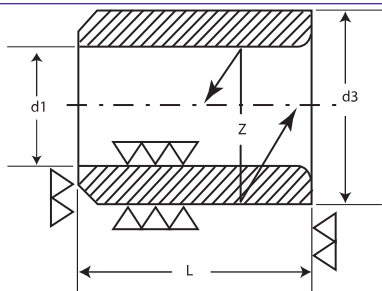
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0.5	3.0	0.01			DG179-005-3-9L	9
0.6	3.0	0.01			DG179-006-3-9L	9
0.7	3.0	0.01			DG179-007-3-9L	9
0.8	3.0	0.01	DG179-008-3-6S	6	DG179-008-3-9L	9
0.9	3.0	0.01	DG179-009-3-6S	6	DG179-009-3-9L	9
1.0	3.0	0.01	DG179-010-3-6S	6	DG179-010-3-9L	9
1.1	4.0	0.01			DG179-011-4-9L	9
1.2	4.0	0.01	DG179-012-4-6S	6	DG179-012-4-9L	9
1.5	4.0	0.01	DG179-015-4-6S	6	DG179-015-4-9L	9
1.6	4.0	0.01	DG179-016-4-6S	6	DG179-016-4-9L	9
1.7	4.0	0.01			DG179-017-4-9L	9
1.8	4.0	0.01			DG179-018-4-9L	9
1.9	5.0	0.01			DG179-019-5-9L	9
2.0	5.0	0.01	DG179-020-5-6S	6	DG179-020-5-9L	9
2.1	5.0	0.01			DG179-021-5-9L	9
2.2	5.0	0.01	DG179-022-5-6S	6	DG179-022-5-9L	9
2.3	5.0	0.01			DG179-023-5-9L	9
2.4	5.0	0.01	DG179-024-5-6S	6	DG179-024-5-9L	9
2.5	5.0	0.01	DG179-025-5-6S	6	DG179-025-5-9L	9
2.6	5.0	0.01	DG179-026-5-6S	6	DG179-026-5-9L	9
2.7	6.0	0.01	DG179-027-6-8S	8	DG179-027-6-12L	12
2.8	6.0	0.01	DG179-028-6-8S	8	DG179-028-6-12L	12
2.9	6.0	0.01	DG179-029-6-8S	8	DG179-029-6-12L	12
3.0	6.0	0.01	DG179-030-6-8S	8	DG179-030-6-12L	12
3.1	6.0	0.01	DG179-031-6-8S	8	DG179-031-6-12L	12
3.2	6.0	0.01	DG179-032-6-8S	8	DG179-032-6-12L	12
3.3	6.0	0.01	DG179-033-6-8S	8	DG179-033-6-12L	12
3.4	7.0	0.01	DG179-034-7-8S	8	DG179-034-7-12L	12
3.5	7.0	0.01	DG179-035-7-8S	8	DG179-035-7-12L	12
3.6	7.0	0.01	DG179-036-7-8S	8	DG179-036-7-12L	12
3.7	7.0	0.01	DG179-037-7-8S	8	DG179-037-7-12L	12
3.8	7.0	0.01	DG179-038-7-8S	8	DG179-038-7-12L	12
3.9	7.0	0.01			DG179-039-7-12L	12
4.0	7.0	0.01	DG179-040-7-8S	8	DG179-040-7-12L	12
4.1	8.0	0.01	DG179-041-8-8S	8	DG179-041-7-12L	12
4.2	8.0	0.01	DG179-042-8-8S	8	DG179-042-7-12L	12
4.3	8.0	0.01	DG179-043-8-8S	8	DG179-043-7-12L	12
4.4	8.0	0.01	DG179-044-8-8S	8	DG179-044-7-12L	12
4.5	8.0	0.01	DG179-045-8-8S	8	DG179-045-8-12L	12
4.6	8.0	0.01	DG179-046-8-8S	8	DG179-046-8-12L	12
4.7	8.0	0.01			DG179-047-8-12L	12
4.8	8.0	0.01	DG179-048-8-8S	8	DG179-048-8-12L	12
4.9	8.0	0.01			DG179-049-8-12L	12



Materials: Case Hardened Steel
Hardness: 62 +/- 2 Hrc



d1 F7	d3 n6	z	Product Code -Short	Short Length	Product Code -Long	Long Length
5.0	8.0	0.01	DG179-050-8-8S	8	DG179-050-8-12L	12
5.1	10.0	0.02	DG179-051-10-10S	10	DG179-051-10-16L	16
5.2	10.0	0.02	DG179-052-10-10S	10	DG179-052-10-16L	16
5.3	10.0	0.02	DG179-053-10-10S	10	DG179-053-10-16L	16
5.4	10.0	0.02	DG179-054-10-10S	10	DG179-054-10-16L	16
5.5	10.0	0.02	DG179-055-10-10S	10	DG179-055-10-16L	16
5.6	10.0	0.02	DG179-056-10-10S	10	DG179-056-10-16L	16
5.7	10.0	0.02			DG179-057-10-16L	16
5.8	10.0	0.02	DG179-058-10-10S	10	DG179-058-10-16L	16
5.9	10.0	0.02			DG179-059-10-16L	16
6.0	10.0	0.02	DG179-060-10-10S	10	DG179-060-10-16L	16
6.1	12.0	0.02	DG179-061-12-10S	10	DG179-061-10-16L	16
6.2	12.0	0.02	DG179-062-12-10S	10	DG179-062-10-16L	16
6.3	12.0	0.02	DG179-063-12-10S	10	DG179-063-10-16L	16
6.4	12.0	0.02	DG179-064-12-10S	10	DG179-064-10-16L	16
6.5	12.0	0.02	DG179-065-12-10S	10	DG179-065-10-16L	16
6.6	12.0	0.02	DG179-066-12-10S	10	DG179-066-10-16L	16
6.7	12.0	0.02	DG179-067-12-10S	10	DG179-067-10-16L	16
6.8	12.0	0.02	DG179-068-12-10S	10	DG179-068-10-16L	16
6.9	12.0	0.02	DG179-069-12-10S	10	DG179-069-10-16L	16
7.0	12.0	0.02	DG179-070-12-10S	10	DG179-070-10-16L	16
7.1	12.0	0.02	DG179-071-12-10S	10	DG179-071-10-16L	16
7.2	12.0	0.02	DG179-072-12-10S	10	DG179-072-10-16L	16
7.3	12.0	0.02	DG179-073-12-10S	10	DG179-073-10-16L	16
7.5	12.0	0.02	DG179-075-12-10S	10	DG179-075-10-16L	16
7.6	12.0	0.02	DG179-076-12-10S	10	DG179-076-10-16L	16
7.7	12.0	0.02			DG179-077-10-16L	16
7.8	12.0	0.02			DG179-078-10-16L	16
7.9	12.0	0.02	DG179-079-12-10S	10	DG179-079-10-16L	16
8.0	12.0	0.02	DG179-080-12-10S	10	DG179-080-10-16L	16
8.0	12.0	0.02	DG179-080-12-12S	12		
8.1	15.0	0.02	DG179-081-15-12S	12	DG179-081-15-20L	20
8.2	15.0	0.02	DG179-082-15-12S	12	DG179-082-15-20L	20
8.3	15.0	0.02	DG179-083-15-12S	12	DG179-083-15-20L	20
8.4	15.0	0.02			DG179-084-15-20L	20
8.5	15.0	0.02	DG179-085-15-12S	12		
8.6	15.0	0.02			DG179-086-15-20L	20
8.7	15.0	0.02			DG179-087-15-20L	20
8.8	15.0	0.02			DG179-088-15-20L	20
8.9	15.0	0.02			DG179-089-15-20L	20
9.0	15.0	0.02			DG179-090-15-20L	20
9.1	15.0	0.02			DG179-091-15-20L	20
9.2	15.0	0.02			DG179-092-15-20L	20
9.3	15.0	0.02	DG179-093-15-12S	12	DG179-093-15-20L	20
9.4	15.0	0.02			DG179-094-15-20L	20



Materials: Case Hardened Steel
Hardness: 62 +/- 2 Hrc



d1 F7	d3 n6	z	Product Code -Short	Short Length	Product Code -Long	Long Length
9.5	15.0	0.02	DG179-095-15-12S	12	DG179-095-15-20L	20
9.6	15.0	0.02	DG179-096-15-12S	12	DG179-096-15-20L	20
9.7	15.0	0.02	DG179-097-15-12S	12	DG179-097-15-20L	20
9.8	15.0	0.02			DG179-098-15-20L	20
9.9	15.0	0.02			DG179-099-15-20L	20
10.0	15.0	0.02	DG179-100-15-12S	12	DG179-100-15-20L	20
10.0	18.0	0.02	DG179-100-18-12S	12		
10.1	18.0	0.02	DG179-101-18-12S	12	DG179-101-18-20L	20
10.2	18.0	0.02			DG179-102-18-20L	20
10.3	18.0	0.02			DG179-103-18-20L	20
10.4	18.0	0.02			DG179-104-18-20L	20
10.5	18.0	0.02	DG179-105-18-12S	12	DG179-105-18-20L	20
10.6	18.0	0.02	DG179-106-18-12S	12	DG179-106-18-20L	20
10.7	18.0	0.02			DG179-107-18-20L	20
10.8	18.0	0.02			DG179-108-18-20L	20
10.9	18.0	0.02			DG179-109-18-20L	20
11.0	18.0	0.02	DG179-110-18-12S	12	DG179-110-18-20L	20
11.1	18.0	0.02			DG179-111-18-20L	20
11.2	18.0	0.02			DG179-112-18-20L	20
11.3	18.0	0.02			DG179-113-18-20L	20
11.4	18.0	0.02			DG179-114-18-20L	20
11.5	18.0	0.02	DG179-115-18-12S	12	DG179-115-18-20L	20
11.7	18.0	0.02			DG179-117-18-20L	20
12.0	18.0	0.02	DG179-120-18-12S	12	DG179-120-18-20L	20
12.5	22.0	0.02	DG179-125-22-16S	16	DG179-125-22-22L	22
12.7	22.0	0.02	DG179-127-22-16S	16		
13.0	22.0	0.02	DG179-130-22-16S	16	DG179-130-22-22L	22
13.5	22.0	0.02	DG179-135-22-16S	16	DG179-135-22-22L	22
14.0	22.0	0.02	DG179-140-22-16S	16	DG179-140-22-22L	22
14.5	22.0	0.02	DG179-145-22-16S	16	DG179-145-22-22L	22
15.0	22.0	0.02	DG179-150-22-16S	16	DG179-150-22-22L	22
15.5	26.0	0.02	DG179-155-26-16S	16	DG179-155-26-22L	22
16.0	26.0	0.02	DG179-160-26-16S	16	DG179-160-26-22L	22
16.5	26.0	0.02	DG179-165-26-16S	16	DG179-165-26-22L	22
17.0	26.0	0.02	DG179-170-26-16S	16	DG179-170-26-22L	22
18.0	26.0	0.02	DG179-180-26-16S	16	DG179-180-26-22L	22
18.5	30.0	0.02	DG179-185-30-20S	20		
19.0	30.0	0.02	DG179-190-30-20S	20	DG179-190-30-36L	36
20.0	30.0	0.02	DG179-200-30-20S	20	DG179-200-30-36L	36
21.0	30.0	0.02			DG179-210-30-36L	36
22.0	30.0	0.02			DG179-220-30-36L	36
24.0	35.0	0.02	DG179-240-35-20S	20	DG179-240-35-36L	36
25.0	35.0	0.02	DG179-250-35-20S	20	DG179-250-35-36L	36
26.0	35.0	0.02	DG179-260-35-20S	20	DG179-260-35-36L	36
28.0	42.0	0.02	DG179-280-42-20S	20		36
30.0	42.0	0.02	DG179-300-42-20S	20	DG179-300-42-36L	36
32.0	48.0	0.04	DG179-320-48-25S	25	DG179-320-48-45L	45



CUTTING TOOLS

■ Endmills	268
■ Slot Drills	269
■ Jobber Drills	272
■ Deep Hole Drills	275
■ Masonry Drills	276
■ Taper Shank Drills	277
■ Centre Drills	278
■ Chucking Reamers	279
■ Counter-bores	280
■ Counter-sinks	281
■ Taps	282
■ Button Dies	286
■ Gun Taps	287
■ Tapping Compounds & Fluids	289
■ Recoil	289
■ Hack Saws, Band Saw blades	290

ABRASIVES

■ Grinding Wheels	292
■ Wet & Dry Sheets	293
■ Dressing Sticks	293
■ Mounted Points	294
■ Diamond Points	295
■ Air Grinders	296
■ Diamond Paste & Thinner	297
■ Felt Bob & Cone	297
■ Carbide Burrs	298
■ Polishing Stones	299
■ Diamond Files	304
■ Hand Files	305

FASTENERS

■ Socket Head Cap Screws	307
■ Socket Shoulder Screws	311
■ Socket Head Counter Sunk Screws	312
■ Socket Set Screws	313
■ Allen Keys	314
■ Tapped Dowel Pins	315
■ Standard Dowel Pins	316
■ Pin Plungers	317
■ Ball Catches	317

EDM SUPPLIES

■ EDM Wires	318
■ EDM Water Filters	320
■ Rust Preventative	322
■ EDM Machine Cleaner	322
■ Resin - Hales brand	322
■ EDM Fluid	323
■ EDM Oil Filters	323
■ Tellurium Copper for EDM Electrodes	324
■ Copper Tubes	325

MATERIALS

■ Gauge Plate	326
■ Silver Steel	329
■ Wash Ground Mild Steel Bar	330
■ Urethane Rods	331
■ Shim Steel	331

SPRINGS

■ Die Springs Medium Duty	332
■ Die Springs Medium Heavy Duty	335
■ Die Springs Heavy Duty	338
■ Die Springs Extra Heavy Duty	341
■ Compression Springs	343
■ Gas Springs	352

CLAMPING & LIFTING

■ Vertical Toggle Clamps	354
■ Push Pull Clamps	356
■ Horizontal Toggle Clamps	360
■ Eye Bolts	363

INDUSTRIAL ACCESSORIES

■ Dial Indicator Kit	367
■ Coolant-proof Digital Calliper	367
■ Micrometer Outside	367
■ Magnetic Stand	368
■ Edge Finder	368
■ Steel Rule Toledo	368
■ Work Finisher Ceramic & Throwaway Knives	369
■ Tape Measure	369
■ Hand Held Refractometer	369
■ Air Tool Oil	370
■ Bearing Blue & Layout Stain	370
■ Tolerance Chart in Microns	371

- VHM - ULTRA grade of carbide for high performance
- Dual stepped core for optimal stability
- Ideal design for pocket milling in MQL & HSC
- Suitable for materials up to 48 HRC
- AlCrN for longer tool life



Product Code	Description	Size mm	Shank Dia mm	Length of Cut	Overall Length
CHMES06	6mm Reg AlCrN Carbide Endmill Harmony	6	6	13	57
CHMES08	8mm Reg AlCrN Carbide Endmill Harmony	8	8	19	63
CHMES10	10mm Reg AlCrN Carbide Endmill Harmony	10	10	22	72
CHMES12	12mm Reg AlCrN Carbide Endmill Harmony	12	12	26	83
CHMES14	14mm Reg AlCrN Carbide Endmill Harmony	14	14	26	83
CHMES16	16mm Reg AlCrN Carbide Endmill Harmony	16	16	32	92
CHMES20	20mm Reg AlCrN Carbide Endmill Harmony	20	20	38	104

Carbide Endmills - Regular

- For precision milling applications
- Suitable for materials up to 1600 N/mm²
- TiAlN for longer tool life



Product Code	Description	Size mm	Shank Dia mm	Length of Cut	Overall Length
CTMES02	2mm Reg TiAlN Carbide Endmill Std	2	3	6	38
CTMES03	3mm Reg TiAlN Carbide Endmill Std	3	3	12	38
CTMES04	4mm Reg TiAlN Carbide Endmill Std	4	4	14	50
CTMES05	5mm Reg TiAlN Carbide Endmill Std	5	6	16	50
CTMES06	6mm Reg TiAlN Carbide Endmill Std	6	6	19	50
CTMES08	8mm Reg TiAlN Carbide Endmill Std	8	8	20	63
CTMES10	10mm Reg TiAlN Carbide Endmill Std	10	10	22	75
CTMES12	12mm Reg TiAlN Carbide Endmill Std	12	12	15	75
CTMES16	16mm Reg TiAlN Carbide Endmill Std	16	16	32	89
CTMES20	20mm Reg TiAlN Carbide Endmill Std	20	20	38	100

Carbide Endmills - Long

- For long-reach finish milling applications
- Suitable for materials up to 1300 N/mm²
- TiAlN for longer tool life



Product Code	Description	Size mm	Shank Dia mm	Length of Cut	Overall Length
CTMEL03	3mm Long TiAlN Carbide Endmill Std	3	3	19	60
CTMEL04	4mm Long TiAlN Carbide Endmill Std	4	4	19	60
CTMEL05	5mm Long TiAlN Carbide Endmill Std	5	5	19	60
CTMEL06	6mm Long TiAlN Carbide Endmill Std	6	6	31	75
CTMEL08	8mm Long TiAlN Carbide Endmill Std	8	8	31	75
CTMEL10	10mm Long TiAlN Carbide Endmill Std	10	10	31	75
CTMEL12	12mm Long TiAlN Carbide Endmill Std	12	12	50	100
CTMEL16	16mm Long TiAlN Carbide Endmill Std	16	16	57	125
CTMEL20	20mm Long TiAlN Carbide Endmill Std	20	20	57	125

- For profile & contour milling
- Suitable for materials up to 1600 N/mm²
- TiAlN for longer tool life



Product Code	Description	Size mm	Shank Dia mm	Length of Cut	Overall Length
CTBEM02	2mm B/N Reg TiAlN Carbide Endmill Std	2	3	6	38
CTBEM03	3mm B/N Reg TiAlN Carbide Endmill Std	3	3	12	38
CTBEM04	4mm B/N Reg TiAlN Carbide Endmill Std	4	4	14	50
CTBEM05	5mm B/N Reg TiAlN Carbide Endmill Std	5	6	16	50
CTBEM06	6mm B/N Reg TiAlN Carbide Endmill Std	6	6	19	50
CTBEM08	8mm B/N Reg TiAlN Carbide Endmill Std	8	8	20	63
CTBEM10	10mm B/N Reg TiAlN Carbide Endmill Std	10	10	22	75
CTBEM12	12mm B/N Reg TiAlN Carbide Endmill Std	12	12	25	75
CTBEM16	16mm B/N Reg TiAlN Carbide Endmill Std	16	16	32	89
CTBEM20	20mm B/N Reg TiAlN Carbide Endmill Std	20	20	38	100

Carbide Endmills Ballnose - Long

- VHM - ULTRA grade of carbide for high performance
- For profile & contour milling in long reach applications
- Suitable for materials up to 1600 N/mm²
- AlCrN for longer tool life



Product Code	Description	Size mm	Shank Dia mm	Length of Cut	Overall Length
CTBEML03	3mm B/N Long TiAlN Carbide Endmill Std	3	6	8	60
CTBEML04	4mm B/N Long TiAlN Carbide Endmill Std	4	6	8	70
CTBEML05	5mm B/N Long TiAlN Carbide Endmill Std	5	6	10	80
CTBEML06	6mm B/N Long TiAlN Carbide Endmill Std	6	6	12	90
CTBEML08	8mm B/N Long TiAlN Carbide Endmill Std	8	8	14	100
CTBEML10	10mm B/N Long TiAlN Carbide Endmill Std	10	10	18	100
CTBEML12	12mm B/N Long TiAlN Carbide Endmill Std	12	12	22	110
CTBEML16	16mm B/N Long TiAlN Carbide Endmill Std	16	16	30	140
CTBEML20	20mm B/N Long TiAlN Carbide Endmill Std	20	20	38	160

Carbide Slot Drill - Regular

- For precision milling of slots & cavities
- Suitable for materials up to 1600 N/mm²
- TiAlN for longer tool life



Product Code	Description	Size mm	Shank Dia mm	Length of Cut	Overall Length
CTMSS03	3mm Reg TiAlN Carbide Slot Drill Std	3	3	12	38
CTMSS04	4mm Reg TiAlN Carbide Slot Drill Std	4	4	14	50
CTMSS05	5mm Reg TiAlN Carbide Slot Drill Std	5	6	16	50
CTMSS06	6mm Reg TiAlN Carbide Slot Drill Std	6	6	19	50
CTMSS08	8mm Reg TiAlN Carbide Slot Drill Std	8	8	20	63
CTMSS10	10mm Reg TiAlN Carbide Slot Drill Std	10	10	22	75
CTMSS12	12mm Reg TiAlN Carbide Slot Drill Std	12	12	25	75
CTMSS16	16mm Reg TiAlN Carbide Slot Drill Std	16	16	32	89
CTMSS20	20mm Reg TiAlN Carbide Slot Drill Std	20	20	38	100

- For profile & contour milling
- Suitable for materials up to 1600 N/mm²
- TiAlN for longer tool life



Product Code	Description	Size mm	Shank Dia mm	Length of Cut	Overall Length
CTBSM02	2mm B/N Long TiAlN Carbide Slot Drill Std	2	3	6	38
CTBSM03	3mm B/N Long TiAlN Carbide Slot Drill Std	3	3	12	38
CTBSM04	4mm B/N Long TiAlN Carbide Slot Drill Std	4	4	14	50
CTBSM05	5mm B/N Long TiAlN Carbide Slot Drill Std	5	6	16	50
CTBSM06	6mm B/N Long TiAlN Carbide Slot Drill Std	6	6	19	50
CTBSM08	8mm B/N Long TiAlN Carbide Slot Drill Std	8	8	20	63
CTBSM10	10mm B/N Long TiAlN Carbide Slot Drill Std	10	10	22	75
CTBSM12	12mm B/N Long TiAlN Carbide Slot Drill Std	12	12	25	75
CTBSM16	16mm B/N Long TiAlN Carbide Slot Drill Std	16	16	32	89
CTBSM20	20mm B/N Long TiAlN Carbide Slot Drill Std	20	20	38	100

Carbide Endmills 3 Flute - Regular

- For precision milling of slots & cavities
- For precision universal milling application
- Suitable for materials up to 1600 N/mm²
- TiAlN for longer tool life



Product Code	Description	Size mm	Shank Dia mm	Length of Cut	Overall Length
CTM3ER03	3mm Reg TiAlN Carbide 3 Flute Endmill Std	3	3	12	38
CTM3ER04	4mm Reg TiAlN Carbide 3 Flute Endmill Std	4	4	14	50
CTM3ER05	5mm Reg TiAlN Carbide 3 Flute Endmill Std	5	6	16	50
CTM3ER06	6mm Reg TiAlN Carbide 3 Flute Endmill Std	6	6	19	50
CTM3ER08	8mm Reg TiAlN Carbide 3 Flute Endmill Std	8	8	20	63
CTM3ER10	10mm Reg TiAlN Carbide 3 Flute Endmill Std	10	10	22	75
CTM3ER12	12mm Reg TiAlN Carbide 3 Flute Endmill Std	12	12	25	75

HSS Endmill - Regular

- For precision finish milling applications
- Suitable for materials up to 850 N/mm²
- For soft steels & non-ferrous material



Product Code	Description	Size mm	Shank Dia mm	Length of Cut	Overall Length
MER03	3mm Reg Endmill	3	6	10	50
MER04	4mm Reg Endmill	4	8	13	60
MER05	5mm Reg Endmill	5	8	16	60
MER06	6mm Reg Endmill	6	8	16	60
MER08	8mm Reg Endmill	8	10	18	65
MER10	10mm Reg Endmill	10	10	21	75
MER12	12mm Reg Endmill	12	12	24	80
MER14	14mm Reg Endmill	14	12	28.5	90
MER16	16mm Reg Endmill	16	16	26.5	95
MER20	20mm Reg Endmill	20	16	38	110
MER25	25mm Reg Endmill	25	25	44.5	120

- For precision finish milling applications
- Suitable for materials up to 850 N/mm²
- For soft steels & non-ferrous material



Product Code	Description	Size mm	Shank Dia mm	Length of Cut	Overall Length
MEL03	3mm Long Endmill	3	6	15	60
MEL04	4mm Long Endmill	4	8	20	60
MEL05	5mm Long Endmill	5	8	25	65
MEL06	6mm Long Endmill	6	8	25	65
MEL08	8mm Long Endmill	8	10	35	80
MEL10	10mm Long Endmill	10	10	45	95
MEL12	12mm Long Endmill	12	12	55	105
MEL16	14mm Long Endmill	16	16	65	120
MEL20	16mm Long Endmill	20	20	75	140

HSS Slot Drill - Regular

- For general milling of slots & cavities
- Suitable for materials up to 850 N/mm²
- For soft steels & non-ferrous material



Product Code	Description	Size mm	Shank Dia mm	Length of Cut	Overall Length
MSR02	2mm Reg Slot Drill	2	6	7	50
MSR03	3mm Reg Slot Drill	3	6	9	50
MSR04	4mm Reg Slot Drill	4	8	12	60
MSR05	5mm Reg Slot Drill	5	8	15	60
MSR06	6mm Reg Slot Drill	6	8	15	60
MSR08	8mm Reg Slot Drill	8	10	20	65
MSR10	10mm Reg Slot Drill	10	10	25	75
MSR12	12mm Reg Slot Drill	12	12	30	80
MSR14	14mm Reg Slot Drill	14	16	35	90
MSR16	16mm Reg Slot Drill	16	16	40	95
MSR20	20mm Reg Slot Drill	20	20	45	110
MSR25	25mm Reg Slot Drill	25	35	50	120

HSS Slot Drill - Long

- For general milling of slots & cavities
- Suitable for materials up to 850 N/mm²
- For soft steels & non-ferrous material



Product Code	Description	Size mm	Shank Dia mm	Length of Cut	Overall Length
MSL03	3mm Long Slot Drill	3	6	15	60
MSL04	4mm Long Slot Drill	4	8	20	60
MSL05	5mm Long Slot Drill	5	8	25	65
MSL06	6mm Long Slot Drill	6	8	25	65
MSL08	8mm Long Slot Drill	8	10	35	80
MSL10	10mm Long Slot Drill	10	10	45	95
MSL12	12mm Long Slot Drill	12	12	55	105
MSL16	16mm Long Slot Drill	16	16	65	120
MSL20	20mm Long Slot Drill	20	20	75	140



- Various combinations available
- Designed for machine and hand drilling

Product Code	Description	Size Range	Pieces	Case
DSET-SM2	Hales Drill 19pcs Set & Case	1.0 - 10.0mm x 0.5	19	ABS
DSET-SM3	Hales Drill 25pcs Set & Case	1.0 - 13.0mm x 0.5	25	ABS
DSET-SM99	Hales Drill 100pcs Set & Case	1.0 - 10mm x .01 (+10.5, 10.9, 11.0, 11.5, 11.9, 12.0, 12.5, 12.9, 13.0mm)	100	Plastic

HSS Jobber Drill - Metric

- General purpose drill
- Web thinned point for easier penetration
- Splitpoint for easier penetration
- Designed for machine and hand drilling



Product Code	Size mm	Length of Cut mm	Overall Length
JDM010	1.00	12	34
JDM0105	1.05	12	34
JDM0110	1.10	14	36
JDM0115	1.15	14	36
JDM0120	1.20	16	38
JDM0125	1.25	16	38
JDM0130	1.30	16	38
JDM0135	1.35	16	38
JDM0140	1.40	18	40
JDM0145	1.45	18	40
JDM0150	1.50	18	40
JDM0155	1.55	20	43
JDM0160	1.60	20	43
JDM0165	1.65	20	43
JDM0170	1.70	20	43
JDM0175	1.75	22	46
JDM0180	1.80	22	46
JDM0185	1.85	22	46
JDM0190	1.90	22	46
JDM0195	1.95	22	46
JDM0200	2.00	24	49
JDM0205	2.05	24	49
JDM0210	2.10	24	49
JDM0215	2.15	27	53
JDM0220	2.20	27	53

Product Code	Size mm	Length of Cut mm	Overall Length
JDM0225	2.25	27	53
JDM0230	2.30	27	53
JDM0235	2.35	27	53
JDM0240	2.40	27	53
JDM0245	2.45	30	57
JDM0250	2.50	30	57
JDM0255	2.55	30	57
JDM0260	2.60	30	57
JDM0265	2.65	30	57
JDM0270	2.70	33	61
JDM0275	2.75	33	61
JDM0280	2.80	33	61
JDM0285	2.85	33	61
JDM0290	2.90	33	61
JDM0295	2.95	33	61
JDM0300	3.00	33	61
JDM0310	3.10	36	65
JDM0320	3.20	36	65
JDM0330	3.30	36	65
JDM0340	3.40	39	70
JDM0350	3.50	39	70
JDM0360	3.60	39	70
JDM0370	3.70	39	70
JDM0380	3.80	43	75
JDM0390	3.90	43	75
JDM0400	4.00	43	75

- General purpose drill
- Web thinned point for easier penetration
- Splitpoint for easier penetration
- Designed for machine and hand drilling



Product Code	Size mm	Length of Cut mm	Overall Length
JDM0410	4.10	43	75
JDM0420	4.20	43	75
JDM0430	4.30	47	80
JDM0440	4.40	47	80
JDM0450	4.50	47	80
JDM0460	4.60	47	80
JDM0470	4.70	47	80
JDM0480	4.80	52	86
JDM0490	4.90	52	86
JDM0500	5.00	52	86
JDM0510	5.10	52	86
JDM0520	5.20	52	86
JDM0530	5.30	52	86
JDM0540	5.40	57	93
JDM0550	5.50	57	93
JDM0560	5.60	57	93
JDM0570	5.70	57	93
JDM0580	5.80	57	93
JDM0590	5.90	57	93
JDM0600	6.00	57	93
JDM0610	6.10	57	93
JDM0620	6.20	63	101
JDM0630	6.30	63	101
JDM0640	6.40	63	101
JDM0650	6.50	63	101
JDM0660	6.60	63	101
JDM0670	6.70	63	101
JDM0680	6.80	69	109
JDM0690	6.90	69	109
JDM0700	7.00	69	109
JDM0710	7.10	69	109
JDM0720	7.20	69	109
JDM0730	7.30	69	109
JDM0740	7.40	69	109
JDM0750	7.50	69	109
JDM0760	7.60	75	117
JDM0770	7.70	75	117
JDM0780	7.80	75	117
JDM0790	7.90	75	117
JDM0800	8.00	75	117
JDM0810	8.10	75	117
JDM0820	8.20	75	117
JDM0830	8.30	75	117
JDM0840	8.40	75	117
JDM0850	8.50	75	117
JDM0860	8.60	81	125

Product Code	Size mm	Length of Cut mm	Overall Length
JDM0870	8.70	81	125
JDM0880	8.80	81	125
JDM0890	8.90	81	125
JDM0900	9.00	81	125
JDM0910	9.10	81	125
JDM0920	9.20	81	125
JDM0930	9.30	81	125
JDM0940	9.40	81	125
JDM0950	9.50	81	125
JDM0960	9.60	87	133
JDM0970	9.70	87	133
JDM0980	9.80	87	133
JDM0990	9.90	87	133
JDM1000	10.00	87	133
JDM1010	10.10	87	133
JDM1020	10.20	87	133
JDM1030	10.30	87	133
JDM1040	10.40	87	133
JDM1050	10.50	87	133
JDM1060	10.60	87	133
JDM1070	10.70	94	142
JDM1080	10.80	94	142
JDM1090	10.90	94	142
JDM1100	11.00	94	142
JDM1110	11.10	94	142
JDM1120	11.20	94	142
JDM1130	11.30	94	142
JDM1140	11.40	94	142
JDM1150	11.50	94	142
JDM1160	11.60	94	142
JDM1170	11.70	94	142
JDM1180	11.80	94	142
JDM1190	11.90	101	151
JDM1200	12.00	101	151
JDM1210	12.10	101	151
JDM1220	12.20	101	151
JDM1230	12.30	101	151
JDM1240	12.40	101	151
JDM1250	12.50	101	151
JDM1260	12.60	101	151
JDM1270	12.70	101	151
JDM1280	12.80	101	151
JDM1290	12.90	101	151
JDM1300	13.00	101	151

- General purpose drill
- Web thinned point for easier penetration
- Splitpoint for easier penetration
- Designed for machine and hand drilling



Product Code	Size inch	Length of Cut mm	Overall Length
JD02	1/32	20	43
JD03	3/64	20	43
JD04	1/16	20	43
JD05	5/64	24	49
JD06	6/64	24	49
JD07	7/64	33	61
JD08	1/8	36	65
JD09	9/64	39	70
JD10	5/32	43	75
JD11	11/64	47	80
JD12	3/16	52	86
JD13	13/64	52	86
JD14	7/32	57	93
JD15	15/64	57	93
JD16	1/4	63	101
JD17	17/64	73	105

Product Code	Size inch	Length of Cut mm	Overall Length
JD18	9/32	69	109
JD19	19/64	75	117
JD20	5/16	75	117
JD21	21/64	75	117
JD22	11/32	81	125
JD23	23/64	81	125
JD24	3/8	87	133
JD25	25/64	87	133
JD26	13/32	87	133
JD27	27/64	94	142
JD28	7/16	94	142
JD29	29/64	94	142
JD30	15/32	101	151
JD31	31/64	111	151
JD32	1/2	114	152

HSS Jobber Drill Long



- General purpose drill
- Web thinned point for easier penetration
- Splitpoint for easier penetration
- Designed for machine and hand drilling

Product Code	Size mm	Length of Cut mm	Overall Length
LDM02	2	57	108
LDM025	2.5	64	117
LDM03	3	70	130
LDM035	3.5	76	137
LDM04	4	86	146
LDM045	4.5	86	146
LDM05	5	92	152
LDM055	5.5	92	152
LDM06	6	95	156
LDM065	6.5	98	159
LDM07	7	98	159
LDM075	7.5	102	162

Product Code	Size mm	Length of Cut mm	Overall Length
LDM08	8	105	165
LDM085	8.5	105	165
LDM09	9	108	171
LDM095	9.5	108	171
LDM10	10	111	178
LDM105	10.5	117	184
LDM11	11	117	184
LDM115	11.5	117	184
LDM12	12	121	197
LDM125	12.5	121	197
LDM13	13	121	203



- Extended Length
- Featuring parabolic deep hole flute design with extra length

Product Code	Description	Size mm	Length of Cut	Overall Length
DM02125	2mm Deep Hole Drill #1	2	90	125
DM03150	3mm Deep Hole Drill #1	3	105	150
DM035165	3.5mm Deep Hole Drill #1	3.5	115	165
DM04175	4mm Deep Hole Drill #1	4	120	175
DM045185	4.5mm Deep Hole Drill #1	4.5	125	185
DM05195	5mm Deep Hole Drill #1	5	135	195
DM055205	5.5mm Deep Hole Drill #1	5.5	140	205
DM06205	6mm Deep Hole Drill #1	6	140	205
DM065215	6.5mm Deep Hole Drill #1	6.5	150	215
DM07225	7mm Deep Hole Drill #1	7	155	225
DM075225	7.5mm Deep Hole Drill #1	7.5	155	225
DM08240	8mm Deep Hole Drill #1	8	165	240
DM085240	8.5mm Deep Hole Drill #1	8.5	165	240
DM09250	9mm Deep Hole Drill #1	9	175	250
DM095250	9.5mm Deep Hole Drill #1	9.5	175	250
DM10265	10mm Deep Hole Drill #1	10	185	265

HSS Deep Hole Drills Series 2



- Extended Length
- Featuring parabolic deep hole flute design with extra length

Product Code	Description	Size mm	Length of Cut	Overall Length
DM02160	2mm Deep Hole Drill #2	2	110	160
DM03190	3mm Deep Hole Drill #2	3	130	190
DM035210	3.5mm Deep Hole Drill #2	3.5	145	210
DM04220	4mm Deep Hole Drill #2	4	150	220
DM045235	4.5mm Deep Hole Drill #2	4.5	160	235
DM05245	5mm Deep Hole Drill #2	5	170	245
DM055260	5.5mm Deep Hole Drill #2	5.5	180	260
DM06260	6mm Deep Hole Drill #2	6	180	260
DM065275	6.5mm Deep Hole Drill #2	6.5	190	275
DM07290	7mm Deep Hole Drill #2	7	200	290
DM075290	7.5mm Deep Hole Drill #2	7.5	200	290
DM08305	8mm Deep Hole Drill #2	8	210	305
DM085305	8.5mm Deep Hole Drill #2	8.5	210	305
DM09320	9mm Deep Hole Drill #2	9	220	320
DM095340	9.5mm Deep Hole Drill #2	9.5	235	340
DM10340	10mm Deep Hole Drill #2	10	235	340



- Extended Length
- Featuring parabolic deep hole flute design with extra length

Product Code	Description	Size mm	Length of Cut	Overall Length
DM025225	2.5mm Deep Hole Drill #3	2.5	150	225
DM03240	3mm Deep Hole Drill #3	3	160	240
DM035265	3.5mm Deep Hole Drill #3	3.5	180	265
DM04280	4mm Deep Hole Drill #3	4	190	280
DM045295	4.5mm Deep Hole Drill #3	4.5	200	295
DM05315	5mm Deep Hole Drill #3	5	210	315
DM055330	5.5mm Deep Hole Drill #3	5.5	225	330
DM06330	6mm Deep Hole Drill #3	6	225	330
DM065350	6.5mm Deep Hole Drill #3	6.5	235	350
DM07370	7mm Deep Hole Drill #3	7	250	370
DM075370	7.5mm Deep Hole Drill #3	7.5	250	370
DM08390	8mm Deep Hole Drill #3	8	265	390
DM085390	8.5mm Deep Hole Drill #3	8.5	265	390
DM09410	9mm Deep Hole Drill #3	9	280	410
DM095430	9.5mm Deep Hole Drill #3	9.5	295	430
DM10430	10mm Deep Hole Drill #3	10	295	430

Masonry Drill - Single Brick



- Single Brick Masonry Drill
- Tradesman quality ideal for use in natural and artificial stone, masonry, brickwork & concrete.

Product Code	Description	Plug Colour	Dia. mm	Overall Length
MDMS03	3 x 60 Masonry Drill	Yellow	3	60
MDMS04	4 x 75 Masonry Drill	Yellow	4	75
MDMS05	5 x 85 Masonry Drill	White	5	85
MDMS055	5.5 x 95 Masonry Drill	Red	5.5	95
MDMS06	6 x 100 Masonry Drill	Red	6	100
MDMS065	6.5 x 100 Masonry Drill	Green	6.5	100
MDMS07	7 x 100 Masonry Drill	Green	7	100
MDMS08	8 x 120 Masonry Drill	Blue	8	120
MDMS09	9 x 120 Masonry Drill	Blue	9	120
MDMS10	10 x 120 Masonry Drill	Orange	10	120



- General purpose drill
- Suitable for materials up to 900 N/mm²

Product Code	Description	Dia mm	Overall Length
TSDM12	12 Morse Taper Shank Drill	12	182
TSDM125	12.5 Morse Taper Shank Drill	12.5	182
TSDM13	13 Morse Taper Shank Drill	13	182
TSDM135	13.5 Morse Taper Shank Drill	13.5	189
TSDM14	14 Morse Taper Shank Drill	14	189
TSDM145	14.5 Morse Taper Shank Drill	14.5	212
TSDM15	15 Morse Taper Shank Drill	15	212
TSDM155	15.5 Morse Taper Shank Drill	15.5	218
TSDM16	16 Morse Taper Shank Drill	16	218
TSDM165	16.5 Morse Taper Shank Drill	16.5	223
TSDM17	17 Morse Taper Shank Drill	17	223
TSDM175	17.5 Morse Taper Shank Drill	17.5	228
TSDM18	18 Morse Taper Shank Drill	18	228
TSDM185	18.5 Morse Taper Shank Drill	18.5	233
TSDM19	19 Morse Taper Shank Drill	19	233
TSDM195	19.5 Morse Taper Shank Drill	19.5	238
TSDM20	20 Morse Taper Shank Drill	20	238
TSDM205	20.5 Morse Taper Shank Drill	20.5	243
TSDM 21	21 Morse Taper Shank Drill	21	243
TSDM 215	21.5 Morse Taper Shank Drill	21.5	248
TSDM 22	22 Morse Taper Shank Drill	22	248
TSDM 225	22.5 Morse Taper Shank Drill	22.5	253
TSDM 23	23 Morse Taper Shank Drill	23	253
TSDM 235	23.5 Morse Taper Shank Drill	23.5	276
TSDM 24	24 Morse Taper Shank Drill	24	281
TSDM 245	24.5 Morse Taper Shank Drill	24.5	281
TSDM 25	25 Morse Taper Shank Drill	25	281
TSDM 255	25.5 Morse Taper Shank Drill	25.5	286
TSDM 26	26 Morse Taper Shank Drill	26	286
TSDM 265	26.5 Morse Taper Shank Drill	26.5	286
TSDM 27	27 Morse Taper Shank Drill	27	291
TSDM 275	27.5 Morse Taper Shank Drill	27.5	291
TSDM 28	28 Morse Taper Shank Drill	28	291
TSDM 285	28.5 Morse Taper Shank Drill	28.5	296
TSDM 29	29 Morse Taper Shank Drill	29	296
TSDM 295	29.5 Morse Taper Shank Drill	29.5	296
TSDM 30	30 Morse Taper Shank Drill	30	296
TSDM 305	30.5 Morse Taper Shank Drill	30.5	301
TSDM 31	31 Morse Taper Shank Drill	31	301

Product Code	Description	Dia mm	Overall Length
TSDM 315	31.5 Morse Taper Shank Drill	31.5	301
TSDM 32	32 Morse Taper Shank Drill	32	334
TSDM 325	32.5 Morse Taper Shank Drill	32.5	334
TSDM 33	33 Morse Taper Shank Drill	33	334
TSDM 335	33.5 Morse Taper Shank Drill	33.5	334
TSDM 34	34 Morse Taper Shank Drill	34	339
TSDM 345	34.5 Morse Taper Shank Drill	34.5	339
TSDM 35	35 Morse Taper Shank Drill	35	339
TSDM 355	35.5 Morse Taper Shank Drill	35.5	339
TSDM 36	36 Morse Taper Shank Drill	36	344
TSDM 365	36.5 Morse Taper Shank Drill	36.5	344
TSDM 37	37 Morse Taper Shank Drill	37	344
TSDM 375	37.5 Morse Taper Shank Drill	37.5	344
TSDM 38	38 Morse Taper Shank Drill	38	349
TSDM 385	38.5 Morse Taper Shank Drill	38.5	349
TSDM 39	39 Morse Taper Shank Drill	39	349
TSDM 395	39.5 Morse Taper Shank Drill	39.5	349
TSDM 40	40 Morse Taper Shank Drill	40	349
TSDM 405	40.5 Morse Taper Shank Drill	40.5	354
TSDM 41	41 Morse Taper Shank Drill	41	354
TSDM 415	41.5 Morse Taper Shank Drill	41.5	354
TSDM 42	42 Morse Taper Shank Drill	42	354
TSDM 425	42.5 Morse Taper Shank Drill	42.5	354
TSDM 43	43 Morse Taper Shank Drill	43	359
TSDM 435	43.5 Morse Taper Shank Drill	43.5	359
TSDM 44	44 Morse Taper Shank Drill	44	359
TSDM 445	44.5 Morse Taper Shank Drill	44.5	359
TSDM 45	45 Morse Taper Shank Drill	45	359
TSDM 455	45.5 Morse Taper Shank Drill	45.5	364
TSDM 46	46 Morse Taper Shank Drill	46	364
TSDM 465	46.5 Morse Taper Shank Drill	46.5	364
TSDM 47	47 Morse Taper Shank Drill	47	364
TSDM 475	47.5 Morse Taper Shank Drill	47.5	364
TSDM 48	48 Morse Taper Shank Drill	48	369
TSDM 485	48.5 Morse Taper Shank Drill	48.5	369
TSDM 49	49 Morse Taper Shank Drill	49	369
TSDM 495	49.5 Morse Taper Shank Drill	49.5	369
TSDM 50	50 Morse Taper Shank Drill	50	369
TSDM 505	50.5 Morse Taper Shank Drill	50.5	374



- Precision drill for machine use
- Rigid design for "seat" position accuracy
- 90° offers hold chamfering and spotting with the one tool
- 120° also available

Product Code	Description	Dia. mm	Overall Length
TMSD06	6.0 Trinite Spot Drill	6	66
TMSD08	8.0 Trinite Spot Drill	8	79
TMSD10	10.0 Trinite Spot Drill	10	89
TMSD12	12.0 Trinite Spot Drill	12	102
TMSD16	16.0 Trinite Spot Drill	16	115
TMSD20	20.0 Trinite Spot Drill	20	131

HSS Centre Drill



- For drilling 60° centre holes in the end of shafts
- Ensures accurate starting and centering for precision

Product Code	Description	Shank inch	Tip Dia. inch	Overall Length - inches
CD1	No. 1 Centre Drill	1/8	3/64	1 1/4
CD2	No. 2 Centre Drill	3/16	5/64	1 7/8
CD3	No. 3 Centre Drill	1/4	7/64	2
CD4	No. 4 Centre Drill	5/16	1/8	2 1/8
CD5	No. 5 Centre Drill	7/16	3/16	2 3/4
CD6	No. 6 Centre Drill	1/2	7/32	3
CD7	No. 7 Centre Drill	5/8	1/4	3 1/4



- Long series
- Straight shank

Product Code	Size mm	Flute Length mm	Overall Length
MRM015	1.5	12	62
MRM025	2.5	21	87
MRM03	3	21	87
MRM035	3.5	25	100
MRM04	4	32	110
MRM045	4.5	32	112
MRM05	5	32	125
MRM055	5.5	32	125
MRM06	6	38	150
MRM065	6.5	38	150
MRM07	7	38	150
MRM08	8	38	150

Product Code	Size mm	Flute Length mm	Overall Length
MRM09	9	45	180
MRM10	10	45	180
MRM11	11	45	180
MRM12	12	50	200
MRM13	13	50	200
MRM14	14	50	200
MRM15	15	50	200
MRM16	16	55	230
MRM18	18	55	230
MRM20	20	65	240
MRM25	25	70	265

HSS Chucking Reamer - Imperial



- Long series
- Straight shank

Product Code	Size imperial	Flute Length inches	Overall Length
MR04	1/16	1/2	2 1/2
MR05	5/64	7/8	3
MR06	3/32	3/4	3
MR08	1/8	7/8	3 1/2
MR10	5/32	1	4
MR12	3/16	1 1/8	4 1/2
MR14	7/32	1 1/4	5
MR16	1/4	1 1/2	6

Product Code	Size imperial	Flute Length inches	Overall Length
MR17	17/64	1 1/2	6
MR18	9/32	1 1/2	6
MR19	19/64	1 1/2	
MR20	5/16	1 1/2	6
MR21	21/64	1 1/2	6
MR22	11/32	1 1/2	6
MR24	3/8	1 3/4	7
MR25	25/64	1 3/4	7
MR26	13/32	1 3/4	7
MR28	7/16	1 3/4	7
MR30	15/32	1 3/4	7
MR32	1/2	2	8
MR40	5/8	2	9
MR48	3/4	2 1/2	9 1/2
MR56	7/8	2 1/2	9 1/2
MR64	1	2 3/4	10 1/2



- Solid pilot style
- 3 flute design
- Right hand cutting
- Nominal size to suit metric socket head cap screws
- Material HSS

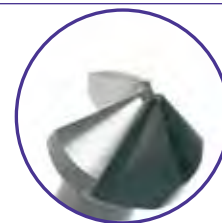
Product Code	Description	Size mm	Shank Dia. mm	Overall Length
HCBO3	M3 Counter-bore Bit	6	5.0	71
HCBO4	M4 Counter-bore Bit	8	5.0	71
HCBO5	M5 Counter-bore Bit	10	8.0	80
HCBO6	M6 Counter-bore Bit	11	8.0	80
HCBO8	M8 Counter-bore Bit	15	12.5	100
HCBO10	M10 Counter-bore Bit	18	12.5	100
HCBO12	M12 Counter-bore Bit	20	12.5	100
HCBO16	M16 Counter-bore Bit (Tapered Shank)	26	MT3	192

Counter-bore Set



7 Piece Hales counter-bore set in case

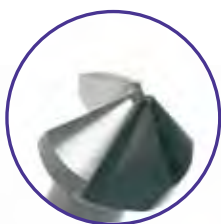
Product Code	Size mm
HCB-SET	M3
	M4
	M5
	M6
	M8
	M10
	M12



- Counter-sinking tool
- For use in portable drills or drilling machines
- For use on most materials including plastics, non-ferrous & ferrous metals
- Material HSS

Product Code	Description	Size mm	Shank Dia. mm	Overall Length
CSK063	6.3mm Counter-sink Bit	6.3	5	45
CSK08	8mm Counter-sink Bit	8	6	50
CSK010	10mm Counter-sink Bit	10	6	50
CSK124	12.4mm Counter-sink Bit	12.4	8	56
CSK15	15mm Counter-sink Bit	15	10	60
CSK165	16.5mm Counter-sink Bit	16.5	10	60
CSK205	20.5mm Counter-sink Bit	20.5	10	63
CSK25	25mm Counter-sink Bit	25	10	67
CSK31	31mm Counter-sink Bit	31	12	71

Counter-sink Set



6 Piece Hales Counter-sink set in case

Product Code	Size mm
CSK-SET	6.3
	8.3
	10.4
	12.4
	16.5
	20.5

Taper



Intermediate



Bottoming



- General purpose use
- Suitable for materials up to 1000 N/mm²
- Through & blind holes
- Suitable for both hand and machine operations
- Material: HSS
- Depths up to approx. 1 x d₁

Product Code	Size	Type	Pitch	Shank Dia mm	Overall Length mm	Drill Dia. mm
TM021	M2	Taper	0.4	2.5	41	1.6
TM022	M2	Intermediate	0.4	2.5	41	1.6
TM023	M2	Bottoming	0.4	2.5	41	1.6
TM0251	M2.5	Taper	0.45	2.8	45	2.05
TM0252	M2.5	Intermediate	0.45	2.8	45	2.05
TM0253	M2.5	Bottoming	0.45	2.8	45	2.05
TM031	M3	Taper	0.5	3.15	48	2.5
TM032	M3	Intermediate	0.5	3.15	48	2.5
TM033	M3	Bottoming	0.5	3.15	48	2.5
TM041	M4	Taper	0.7	4	53	3.3
TM042	M4	Intermediate	0.7	4	53	3.3
TM043	M4	Bottoming	0.7	4	53	3.3
TM051	M5	Taper	0.8	5	58	4.2
TM052	M5	Intermediate	0.8	5	58	4.2
TM053	M5	Bottoming	0.8	5	58	4.2
TM061	M6	Taper	1	6.3	66	5
TM062	M6	Intermediate	1	6.3	66	5
TM063	M6	Bottoming	1	6.3	66	5
TM081	M8	Taper	1.25	8	72	6.8
TM082	M8	Intermediate	1.25	8	72	6.8
TM083	M8	Bottoming	1.25	8	72	6.8
TM101	M10	Taper	1.5	10	80	8.5
TM102	M10	Intermediate	1.5	10	80	8.5
TM103	M10	Bottoming	1.5	10	80	8.5
TM121	M12	Taper	1.75	9	89	10.2
TM122	M12	Intermediate	1.75	9	89	10.2
TM123	M12	Bottoming	1.75	9	89	10.2
TM141	M14	Taper	2	11.2	95	12
TM142	M14	Intermediate	2	11.2	95	12
TM143	M14	Bottoming	2	11.2	95	12
TM161	M16	Taper	2	12.5	102	14
TM162	M16	Intermediate	2	12.5	102	14
TM163	M16	Bottoming	2	12.5	102	14
TM181	M18	Taper	2.5	14	112	15.5
TM182	M18	Intermediate	2.5	14	112	15.5
TM183	M18	Bottoming	2.5	14	112	15.5
TM201	M20	Taper	2.5	14	112	17.5
TM202	M20	Intermediate	2.5	14	112	17.5
TM203	M20	Bottoming	2.5	14	112	17.5
TM241	M24	Taper	3	18	130	21
TM242	M24	Intermediate	3	18	130	21
TM243	M24	Bottoming	3	18	130	21



- General purpose use
- Suitable for materials up to 1000 N/mm²
- Through & blind holes
- Suitable for both hand and machine operations
- Material: HSS
- Depths up to approx. 1 x d_i

Product Code	Size	Type	TPI	Shank Dia mm	Overall Length mm	Drill Dia. mm
TW081	1/8	Taper	40	3.2	48	2.6
TW082	1/8	Intermediate	40	3.2	48	2.6
TW083	1/8	Bottoming	40	3.2	48	2.6
TW121	3/16	Taper	24	5	58	3.7
TW122	3/16	Intermediate	24	5	58	3.7
TW123	3/16	Bottoming	24	5	58	3.7
TW141	7/32	Taper	24(WHIT)	5.6	62	4.5
TW142	7/32	Intermediate	24(WHIT)	5.6	62	4.5
TW143	7/32	Bottoming	24(WHIT)	5.6	62	4.5
TW161	1/4	Taper	20	6.3	66	5.1
TW162	1/4	Intermediate	20	6.3	66	5.1
TW163	1/4	Bottoming	20	6.3	66	5.1
TW201	5/16	Taper	18	8	72	6.5
TW202	5/16	Intermediate	18	8	72	6.5
TW203	5/16	Bottoming	18	8	72	6.5
TW241	3/8	Taper	16	10	80	7.9
TW242	3/8	Intermediate	16	10	80	7.9
TW243	3/8	Bottoming	16	10	80	7.9
TW281	7/16	Taper	14	8	85	9.3
TW282	7/16	Intermediate	14	8	85	9.3
TW283	7/16	Bottoming	14	8	85	9.3
TW321	1/2	Taper	12	9	89	10.5
TW322	1/2	Intermediate	12	9	89	10.5
TW323	1/2	Bottoming	12	9	89	10.5
TW361	9/16	Taper	12	11.2	95	12.1
TW362	9/16	Intermediate	12	11.2	95	12.1
TW363	9/16	Bottoming	12	11.2	95	12.1
TW401	5/8	Taper	11	12.5	102	13.5
TW402	5/8	Intermediate	11	12.5	102	13.5
TW403	5/8	Bottoming	11	12.5	102	13.5
TW481	3/4	Taper	10	14	112	16.3
TW482	3/4	Intermediate	10	14	112	16.3
TW483	3/4	Bottoming	10	14	112	16.3



- General purpose use
- Suitable for materials up to 1000 N/mm²
- Through & blind holes
- Suitable for both hand and machine operations
- Material: HSS
- Depths up to approx. 1 x d₁

Product Code	Size	Type	Pitch	Shank Dia mm	Overall Length mm	Drill Dia. mm
TMS03	M3	HSS Hand Tap Set Metric Includes Taper, Intermediate and Bottoming Taps	0.5	3.15	48	2.5
TMS04	M4		0.7	4	53	3.3
TMS05	M5		0.8	5	58	4.2
TMS06	M6		1	6.3	66	5
TMS08	M8		1.25	8	72	6.8
TMS10	M10		1.5	10	80	8.5
TMS12	M12		1.75	9	89	10.2
TMS14	M14		2	11.2	95	12
TMS16	M16		2	12.5	102	14
TMS18	M18		2.5	14	112	15.5
TMS20	M20		2.5	14	112	17.5
TMS24	M24		3	18	130	21

Hand Tap Sets - Imperial BSW



- General purpose use
- Suitable for materials up to 1000 N/mm²
- Through & blind holes
- Suitable for both hand and machine operations
- Material: HSS
- Depths up to approx. 1 x d₁

Product Code	Size -inch	Type	TPI	Shank Dia mm	Overall Length mm	Drill Dia. mm
TWS08	1/8	HSS Hand Tap Set Imperial Includes Taper, Intermediate and Bottoming Taps	40	3.15	48	2.55
TWS10	5/32		32	4	53	3.2
TWS12	3/16		24(WHIT)	5	58	3.7
TWS16	1/4		20	6.3	66	5.1
TWS20	5/16		18	8	72	6.5
TWS24	3/8		16	10	80	7.9
TWS28	7/16		14	8	85	9.3
TWS32	1/2		12	9	89	10.5



- General purpose use
- Suitable for materials up to 1000 N/mm²
- Blind holes
- Material: HSS
- Depths up to approx. 2.5 x d₂

Product Code	Size	Type	Pitch	Shank Dia mm	Overall Length mm	Drill Dia. mm
TSFM03	M3	M3 Spiral Fluted Tap HSS	0.5	3.15	48	2.5
TSFM04	M4	M4 Spiral Fluted Tap HSS	0.7	4	53	3.3
TSFM05	M5	M5 Spiral Fluted Tap HSS	0.8	5	58	4.2
TSFM06	M6	M6 Spiral Fluted Tap HSS	1	6.3	66	5
TSFM08	M8	M8 Spiral Fluted Tap HSS	1.25	8	72	6.8
TSFM10	M10	M10 Spiral Fluted Tap HSS	1.5	10	80	8.5
TSFM12	M12	M12 Spiral Fluted Tap HSS	1.75	9	89	10.2
TSFM14	M14	M14 Spiral Fluted Tap HSS	2	11.2	95	12
TSFM16	M16	M16 Spiral Fluted Tap HSS	2	12.5	102	14
TSFM20	M20	M20 Spiral Fluted Tap HSS	2.5	14	112	17.5

Pipe Taps, Straight Flute - Imperial BSPT



- General purpose use
- Suitable for materials up to 1000 N/mm²
- Through & blind holes
- Suitable for both hand and machine operations
- Material: HSS
- Taper pipe reamer recommended prior to tapping Rc BSPT thread form

Product Code	Size	Type	TPI	Shank Dia mm	Overall Length mm	Drill Dia. mm
TPT08ORD	1/8	1/8 BSPT Tap HSS	28	8.00	59	8.4
TPT16ORD	1/4	1/4 BSPT Tap HSS	19	10.00	67	10.8
TPT24ORD	3/8	3/8 BSPT Tap HSS	19	12.50	75	14.5
TPT32ORD	1/2	1/2 BSPT Tap HSS	14	16.00	87	18.0
TPT48ORD	3/4	3/4 BSPT Tap HSS	14	20.00	96	23.0

- General purpose use
- Suitable for materials up to 1000 N/mm²
- Through & Blind holes
- Suitable for both hand and machine operations
- Material: HSS
- Depths up to approx. 1 x d₂

Taper



Intermediate



Bottoming



Product Code	Size	Type	TPI	Shank Dia mm	Overall Length mm	Drill Dia. mm
TP081	1/8	Taper	28	8.00	59	8.80
TP082	1/8	Intermediate	28	8.00	59	8.80
TP083	1/8	Bottoming	28	8.00	59	8.80
TP161	1/4	Taper	19	10.00	67	11.80
TP162	1/4	Intermediate	19	10.00	67	11.80
TP163	1/4	Bottoming	19	10.00	67	11.80
TP241	3/8	Taper	19	12.50	75	15.30
TP242	3/8	Intermediate	19	12.50	75	15.30
TP243	3/8	Bottoming	19	12.50	75	15.30
TP321	1/2	Taper	14	16.00	87	19.00
TP322	1/2	Intermediate	14	16.00	87	19.00
TP323	1/2	Bottoming	14	16.00	87	19.00
TP481	3/4	Taper	14	20.00	96	24.50
TP482	3/4	Intermediate	14	20.00	96	24.50
TP483	3/4	Bottoming	14	20.00	96	24.50
TP641	1	Taper	11	25.00	109	31.00
TP642	1	Intermediate	11	25.00	109	31.00
TP643	1	Bottoming	11	25.00	109	31.00

Button Dies - Metric



- Metric coarse
- Circular split button die
- Material: HSS

Product Code	Size	Type	Pitch	Outer Dia. inch
BD03	M3	Button Die 3mm x 0.5 pitch x 1 inch outer dia.	0.5	1
BD04	M4	Button Die 4mm x 0.7 pitch x 1 inch outer dia.	0.7	1
BD05	M5	Button Die 5mm x 0.8 pitch x 1 inch outer dia.	0.8	1
BD06	M6	Button Die 6mm x 1.0 pitch x 1 inch outer dia.	1	1
BD08	M8	Button Die 8mm x 1.25 pitch x 1 inch outer dia.	1.25	1
BD10	M10	Button Die 10mm x 1.5 pitch x 1 1/2 inch outer dia.	1.5	1 1/2
BD12	M12	Button Die 12mm x 1.75 pitch x 1 1/2 inch outer dia.	1.75	1 1/2
BD16	M16	Button Die 16mm x 2.0 pitch x 2 inch outer dia.	2	2
BD20	M20	Button Die 20mm x 2.5 pitch x 2 inch outer dia.	2.5	2



- General purpose use
- Suitable for materials up to 1000 N/mm²
- Through holes
- Material: HSS
- Depths up to approx. 3 x d_i

Product Code	Size	Type	Pitch	Shank Dia mm	Overall Length mm	Drill Dia. mm
TMG03	M3	M3 Gun Nose Tap HSS	0.5	3.15	48	2.5
TMG04	M4	M4 Gun Nose Tap HSS	0.7	4	53	3.3
TMG05	M5	M5 Gun Nose Tap HSS	0.8	5	58	4.2
TMG06	M6	M6 Gun Nose Tap HSS	1	6.3	66	5
TMG08	M8	M8 Gun Nose Tap HSS	1.25	8	72	6.8
TMG10	M10	M10 Gun Nose Tap HSS	1.5	10	80	8.5
TMG12	M12	M12 Gun Nose Tap HSS	1.75	9	89	10.2
TMG14	M14	M14 Gun Nose Tap HSS	2	11.2	95	12
TMG16	M16	M16 Gun Nose Tap HSS	2	12.5	102	14
TMG18	M18	M18 Gun Nose Tap HSS	2.5	14	112	15.5
TMG20	M20	M20 Gun Nose Tap HSS	2.5	14	112	17.5

Gun Taps - Imperial BSW



- General purpose use
- Suitable for materials up to 1000 N/mm²
- Through holes
- Material: HSS
- Depths up to approx. 3 x d_i

Product Code	Size - inch	Type	TPI	Shank Dia mm	Overall Length mm	Drill Dia. mm
TWG08	1/8	1/8 Gun Nose Tap HSS	40	3.15	48	2.55
TWG10	5/32	5/32 Gun Nose Tap HSS	32	4	53	3.2
TWG12	3/16	3/16 Gun Nose Tap HSS	24	5	58	3.7
TWG16	1/4	1/4 Gun Nose Tap HSS	20	6.3	66	5.1
TWG20	5/16	5/16 Gun Nose Tap HSS	18	8	72	6.5
TWG24	3/8	3/8 Gun Nose Tap HSS	16	10	80	7.9
TWG32	1/2	1/2 Gun Nose Tap HSS	12	9	89	10.5
TWG40	5/8	5/8 Gun Nose Tap HSS	11	12.5	102	16.25
TWG48	3/4	3/4 Gun Nose Tap HSS	10	14	112	19.25



Gun Tap Set HSSE
M3 - M12 Taps (7 Pieces)
2.5 - 10.2 mm Tapping Drills (7 Pieces)

Product Code	Product	Pack Size
GUN-SET	Gun Tap Set	7 pcs

Spiral Tap Set - Metric



Spiral Tap Set HSSE
M3 - M12 Taps (7 Pieces)
2.5 - 10.2 mm Tapping Drills (7 Pieces)

Product Code	Product	Pack Size
SPIRAL-SET	Spiral Tap Set	7 pcs



Bulk Inserts Available

Kit Includes:

- High Speed Steel Drill
- HSS STI Tap
- Combination Tap and Installation Tool
- Magnetic Tang Removal Tool
- Quantity of Inserts
- Easy to follow instruction
- All contained in a quality case

Product Code	Description
RC02-0.4	M2 x 0.4 Thread Repair Kit
RC03-0.5	M3 x 0.5 Thread Repair Kit
RC04-0.7	M4 x 0.7 Thread Repair Kit
RC05-0.8	M5 x 0.8 Thread Repair Kit
RC06-1.0	M6 x 1.0 Thread Repair Kit
RC08-1.25	M8 x 1.25 Thread Repair Kit
RC10-1.5	M10 x 1.5 Thread Repair Kit
RC12-1.75	M12 x 1.75 Thread Repair Kit

Tapping Compounds & Fluids



Product	Product Code	Description	Volume
Treflex Paste	CRC-TREF500ML	Treflex is a green coloured, active cutting compound. Suitable for pipe screwing, hack sawing, tapping, reaming, etc.	500 ml
	CRC-TREF2LT		2 Lt
Treflex HD Fluid	CRC-TREF HD 500	Treflex HD cutting fluid is an extreme duty, thick fluid that sticks to the cutting tool through out the operation. Ideal for tapping and drilling stainless steel, and titanium.	500 ml
Cut ADE Fluid	MAT-CUTADE-050	Cutting fluid for direct application. Unique solution for dealing with metalworking in any way. Longer tool life, less broken taps, better work piece finish. No hazardous symbols.	500 ml

- Quality band saw blade in plastic case x 100ft
- Available in HSS & Bi Metal
- Custom band saw blades also available on request



Product Code	Blade Width - inch	Teeth per Inch
BB0408	1/4	8 Teeth Per Inch
BB0410	1/4	10 Teeth Per Inch
BB0414	1/4	14 Teeth Per Inch
BB0418	1/4	18 Teeth Per Inch
BB0608	3/8	8 Teeth Per Inch
BB0610	3/8	10 Teeth Per Inch
BB0614	3/8	14 Teeth Per Inch
BB0618	3/8	18 Teeth Per Inch
BB0624	3/8	24 Teeth Per Inch
BB0806	1/2	6 Teeth Per Inch
BB0808	1/2	8 Teeth Per Inch
BB0810	1/2	10 Teeth Per Inch
BB0814	1/2	14 Teeth Per Inch
BB0818	1/2	18 Teeth Per Inch
BB0824	1/2	24 Teeth Per Inch
BB1210	3/4	10 Teeth Per Inch

Hack Saw Frame & Blades



Product Code	Pack Quantity	Description	Material
HSF	1	Professional ergonomic design with soft grip handle.. Premium quality Bi-Metal Cobalt HSS blade included.. Made from light-weight anodised Aluminium.	Made from light-weight anodised aluminium.

Product Code	Pack Quantity	Teeth per Inch	Material
HSB1218	2	18 Teeth Per Inch	Bi Metal HSS
HSB1224	2	24 Teeth Per Inch	Bi Metal HSS
HSB1232	2	32 Teeth Per Inch	Bi Metal HSS
HSBC1218	2	18 Teeth Per Inch	Bi Metal Cobalt HSS
HSBC1224	2	24 Teeth Per Inch	Bi Metal Cobalt HSS
HSBC1232	2	32 Teeth Per Inch	Bi Metal Cobalt HSS

Product Code	Size	Grit
CUTOFF-1501019-60	150 x 1.0 x 19.05	60
CUTOFF-1501631-46	150 x 1.6 x 31.75	46
CUTOFF-1501631-60	150 x 1.6 x 31.75	60
CUTOFF-1801631-46	180 x 1.6 x 31.75	46
CUTOFF-1801631-60	180 x 1.6 x 31.75	60
CUTOFF-2001631-46	200 x 1.6 x 31.75	46
CUTOFF-2001631-60	200 x 1.6 x 31.75	60



Surface Grinding Wheel - White Aluminium Oxide

Product Code	Size	Grit	Grade
GWW-1501331-46K	150 x 13 x 31.75	46	WA/38A
GWW-1501331-60K	150 x 13 x 31.75	60	WA/38A
GWW-1800631-46K	180 x 6 x 31.75	46	WA/38A
GWW-1800631-60K	180 x 6 x 31.75	60	WA/38A
GWW-1801331-46K	180 x 13 x 31.75	46	WA/38A
GWW-2001331-46K	200 x 13 x 31.75	46	WA/38A
GWW-2001331-60K	200 x 13 x 31.75	60	WA/38A
GWW-2002031-46J	200 x 20 x 31.75	46	WA/38A
GWW-2002031-60J	200 x 20 x 31.75	60	WA/38A
GWW-2002050-46J	200 x 20 x 50.8	46	WA/38A
GWW-2002050-60J	200 x 20 x 50.8	60	WA/38A
GWW-200253175-46K	200 x 25 x 31.75	46	WA/38A
GWW-200253175-60K	200 x 25 x 31.75	60	WA/38A
GWW-2002550-46J	200 x 25 x 50.8	46	WA/38A
GWW-2002550-60J	200 x 25 x 50.8	60	WA/38A
GWW-2502550-46J	250 x 25 x 50.8	46	WA/38A
GWW-2502576-46J	250 x 25 x 76.2	46	WA/38A
GWW-2502576-60J	250 x 25 x 76.2	60	WA/38A
GWW-3002576-46J	300 x 25 x 76.2	46	WA/38A
GWW-3002576-60K	300 x 25 x 76.2	60	WA/38A
GWW-30038127-46K	300 x 38 x 127	46	WA/38A (Recess one side)
GWW-35038127-46K	350 x 38 x 127	46	WA/38A (Recess one side)



Application - General Purpose

Material - Hard & Soft

Life - Standard

Surface Grinding Wheel - Blue Ceramic

Product Code	Size	Grit	Grade
GWB-1801331-46K	180 x 13 x 31.75	46	3CXG/3SG
GWB-1801331-60K	180 x 13 x 31.75	60	3CXG/3SG
GWB-2001331-46K	200 x 13 x 31.75	46	3CXG/3SG
GWB-2001331-60K	200 x 13 x 31.75	60	3CXG/3SG
GWB-35025127-46K	350 x 25 x 127	46	3CXG/3SG
GWB-35040127-46K	350 x 40 x 127	46	3CXG/3SG (Recess one side)
GWB-40050127-46J	400 x 50 x 127	46	3CXG/3SG



Application - Tool & Die Sharpening

Material - Hard (Tool steel/ HSS)

Life - Long Life



Product Code	Size	Grit	Grade
GWQ-2002031-461	200 x 20 x 31.75	46	NQ
GWQ-2002031-601	200 x 20 x 31.75	60	NQ
GWQ-3005076-46G	300 x 50 x 76	46	NQ (Recess 2 Sides)
GWQ-35040127-46G	350 x 40 x 127	46	NQ (Recess 1 Side)
GWQ-40050127-46F	400 x 50 x 127	46	NQ

Application - General Purpose

Material - Hard & Soft

Life - Extra Long Life

Diamond Dresser



Product Code	Diameter	Carat
DD035	3/8"	.05 Crt
DD045	1/2"	.05 Crt

Bench Grinding Wheel - Grey Aluminium Oxide



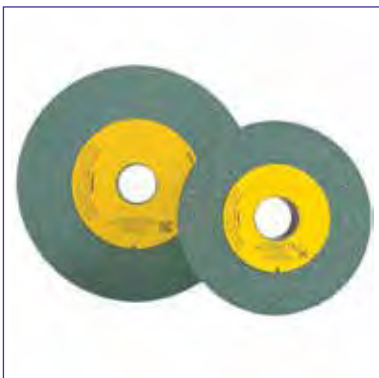
Product Code	Size	Grit	Grade
GWGY-1802531-A60	180 x 25 x 31.75	60	A60M
GWGY-2002031-A60	200 x 20 x 31.75	60	A60M
GWGY-2002531-A36	200 x 20 x 31.75	36	A36P
GWGY-2002531-A46	200 x 20 x 31.75	46	A46M
GWGY-2002531-A60	200 x 20 x 31.75	60	A60M
GWYG-200253175-A36	200 x 25 x 31.75	36	A36M
GWYG-200253175-A46	200 x 25 x 31.75	46	A46M
GWYG-200253175-A60	200 x 25 x 31.75	60	A60M

Application - General Purpose

Material - Soft

Life - Standard

Bench Grinding Wheel - Green Silicone Carbide



Product Code	Size	Grit	Grade
GWGN-1802531-60K	180 x 25 x 31.75	60	GC
GWGN-2002531-60K	200 x 25 x 31.75	60	GC
GWGN-2002531-80K	200 x 25 x 31.75	80	GC

Application - Carbide Tooling

Material - Hard (Carbide)

Life - Standard

Product Code	Size	Colour
DS-25	25mm sq x 150mm	Dark Grey



Economy Rolls

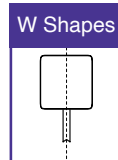
Width 25mm		Width 40mm		Width 50mm	
Product Code	Grit	Product Code	Grit	Product Code	Grit
ER25060	60	ER40060	60	ER50060	60
ER25080	80	ER40080	80	ER50080	80
ER25120	120	ER40120	120	ER50100	100
ER25180	180	ER40180	180	ER50120	120
ER25240	240	ER40240	240	ER50180	180
ER25320	320	ER40320	320	ER50240	240
				ER50320	320



Wet & Dry Sheets

Product Code	Grit	Product Code	Grit
WD0080	80	WD0320	320
WD0100	100	WD0400	400
WD0120	120	WD0500	500
WD0150	150	WD0600	600
WD0180	180	WD0800	800
WD0220	220	WD1000	1000
WD0240	240	WD1200	1200
WD0280	280		





"W" Shapes

All W Shapes are basically rectangular or square. The diameter and thickness are shown in the table below.

Product Code	Diameter	Thick	Mandrel	Grit
MPW142	3/32	1/4	1/8	60
MPW144	1/8	1/4	1/8	60
MPW145	1/8	3/8	1/8	60
MPW146	1/8	1/2	1/8	60
MPW149	5/32	1/4	1/8	60
MPW153	3/16	3/8	1/8	60
MPW154	3/16	1/2	1/8	60
MPW160	1/4	1/4	1/8	80
MPW162	1/4	3/8	1/8	60
MPW163	1/4	1/2	1/8	60
MPW164	1/4	3/4	1/8	100
MPW170	5/16	1/2	1/8	60
MPW176	3/8	1/2	1/8	60
MPW177	3/8	3/4	1/8	60
MPW185	1/2	1/2	1/8	80
MPW220	1	1	1/4	60

Mounted Points

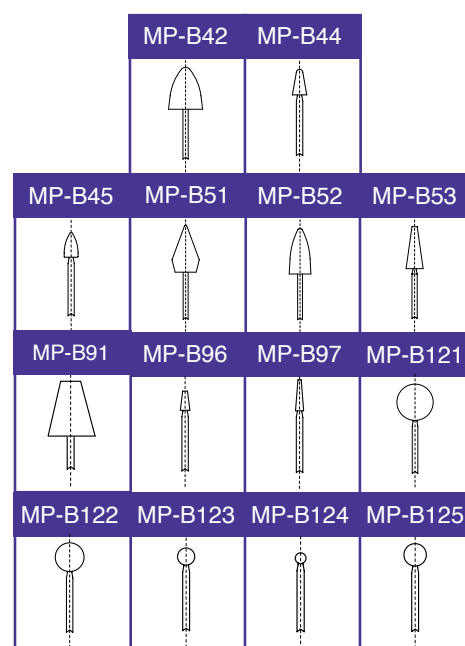


"B" Shapes

B Shapes vary in shape and size, see diagrams.

The diameter and thickness are shown in the table below.

Product Code	Diameter	Thick	Mandrel	Grit
MPB42	1/2	3/4	1/8	60
MPB44	7/32	3/8	1/8	60
MPB45	3/16	5/16	1/8	60
MPB51	7/16	3/4	1/8	80
MPB52	3/8	3/4	1/8	60
MPB53	1/4	5/8	1/8	60
MPB97	1/8	3/8	1/8	60
MPB121	1/2	1/2	1/8	120
MPB122	3/8	3/8	1/8	120
MPB123	3/16	3/16	1/8	60
MPB125	1/4	1/4	1/8	60
MPB132	3/8	1/2	1/8	60
MPB135	1/4	1/2	1/8	60





Product Code	Description	Package Size
MPSET	Pink Mounted Points	Box of 48 pieces

Diamond Point Sets



Product Code	Description
DP	30 Medium grit diamond plated mounted points picked to suit the toolmaker, sold in a plastic case.

Diamond Rubbing Points



Product Code	Diameter	Overall Length	Grit	Colour
RP04080	4 mm	13 mm	80	Orange
RP06120	6 mm	17 mm	120	Green
RP06180	6 mm	17 mm	180	Yellow
RP08080	8 mm	20 mm	80	Orange
RP08120	8 mm	20 mm	120	Green
RP08180	8 mm	20 mm	180	Yellow
RP10080	10 mm	20 mm	80	Orange
RP10120	10 mm	20 mm	120	Green
RP10180	10 mm	20 mm	180	Yellow
RP13080	13 mm	20 mm	80	Orange
RP20080	20 mm	25 mm	80	Orange
RP20120	20 mm	25 mm	120	Green
RP20180	20 mm	25 mm	180	Yellow



The ultimate in precision air grinders, 64,000 RPM.
Ideal for quality tool room work.
Suits 1/8" shank

Product Code	Description	RPM
AG	Straight Premium Grinder	64,000

Economy Air Grinder



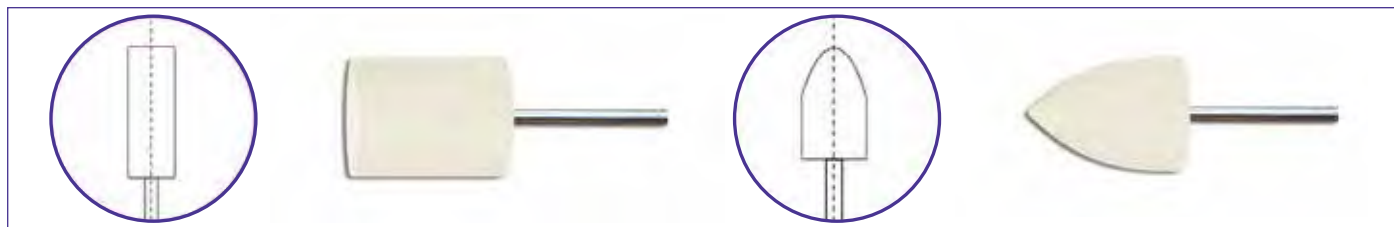
Economy Air Grinder is ideal for tool room work.
Suits 3mm and 1/8" shank

Product Code	Description	RPM
LDG5202	Straight Economy Grinder	54,000

120° Angle Pad Grinder



Product Code	Description	RPM
LDG57101	120° Pad Grinder	22,000



FB = Standard Felt Bob

Product Code	Dia.	Overall Length	Shank Size
FB1414	1/4	1/4	1/8
FB14516	1/4	5/16	1/8
FB3838	3/8	3/8	1/8
FB1212	1/2	1/2	1/8
FB121	1/2	1	1/8
FB3434	3/4	3/4	1/8
FB11	1	1	1/4

FBH = Hard Felt Bob

Product Code	Dia.	Overall Length	Shank Size
FBH1414	1/4	1/4	1/8
FBH3838	3/8	3/8	1/8
FBH1212	1/2	1/2	1/8
FBH3434	3/4	3/4	1/8

FC = Standard Felt Cone

Product Code	Dia.	Overall Length	Shank Size
FC14	1/4	5/8	1/8
FC24	3/8	7/8	1/8
FC12	1/2	1	1/8
FC58	5/8	1 1/4	1/8

Diamond Paste



Product Code	Microns	Colour	Description
DP01	1 Micron	Light Blue	The Superfine grade is for those applications which demand the highest possible accuracy and mirror finish.
DP03	3 Micron	Green	
DP06	6 Micron	Yellow	
DP09	9 Micron	Red	The Medium grades ensure a perfect intermediate surface for finishing to a high grade commercial polish with the Find grades.
DP15	15 Micron	Light Brown	
DP30	30 Micron	Dark Brown	
DP45	45 Micron	Purple	The Coarse and Extra Coarse grades ensure rapid stock removal for eliminating machining marks, deep scratches or blemishes.
DP60	60 Micron	Orange	

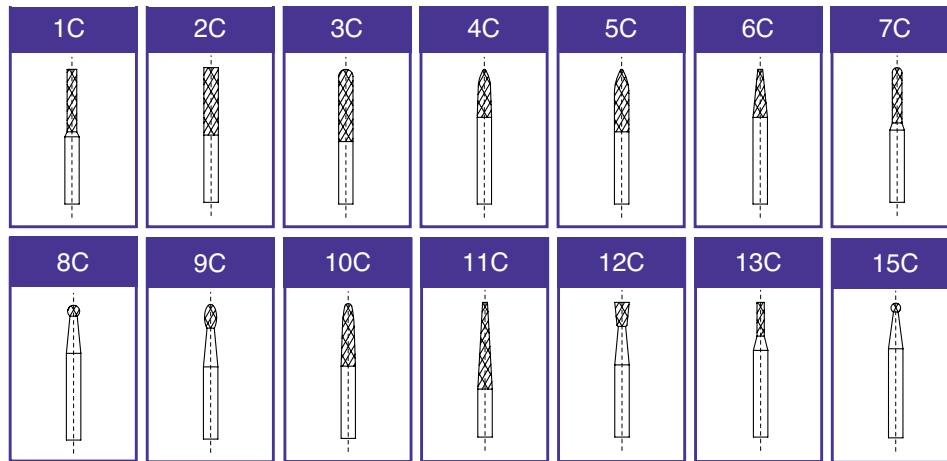
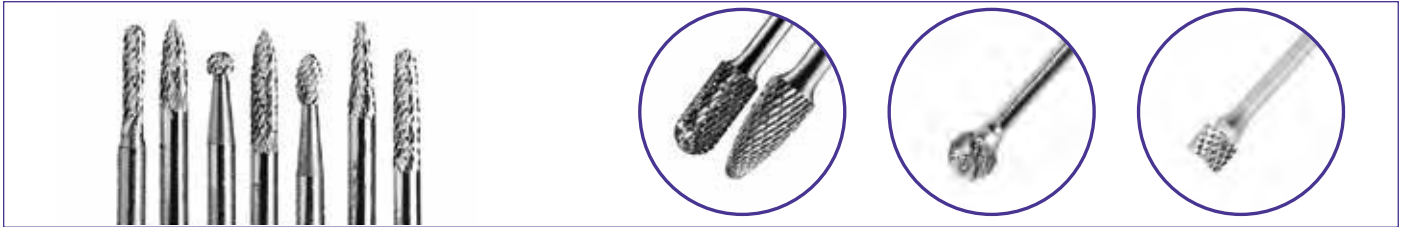
Diamond Thinner



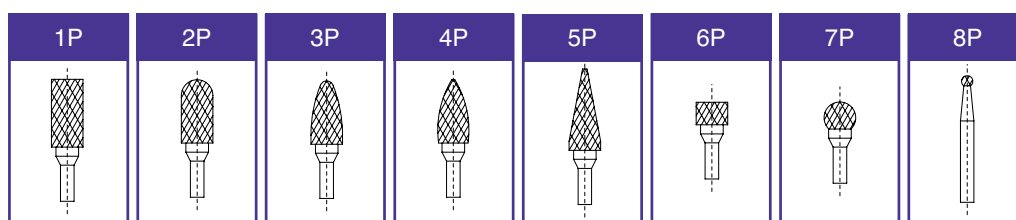
Diamond Thinner is used to thin the slurry, extend the diamond compound and reduce gumming. It offers excellent surface tension and adhesion to tool surfaces.

The precise blend of natural diamond offers unsurpassed cutting capability, toughness and extended durability resulting in superior finishing. DIAMAX is a medium-heavy concentration that is both water and oil soluble.

Product Code	Volume
DPT04	4 oz. (118 ml)
DPT16	16 oz. (475 ml)



Product Code	Shank Dia.	Cutting Dia.	Flute Length
1C	1/8"	3/32"	7/16"
2C	1/8"	1/8"	9/16"
3C	1/8"	1/8"	9/16"
4C	1/8"	1/8"	3/8"
5C	1/8"	1/8"	1/2"
6C	1/8"	1/8"	1 1/32"
7C	1/8"	3/32"	7/16"
8C	1/8"	1/8"	1/8"
9C	1/8"	1/8"	7/32"
10C	1/8"	1/8"	1/2"
11C	1/8"	1/8"	5/8"
12C	1/8"	1/8"	3/16"
13C	1/8"	1/16"	1/4"
15C	1/8"	3/32"	3/32"



Product Code	Shank Dia.	Cutting Dia.	Flute Length
1P	1/8"	1/4"	1/2"
2P	1/8"	1/4"	1/2"
3P	1/8"	1/4"	1/2"
4P	1/8"	1/4"	1/2"
5P	1/8"	1/4"	1/2"
7P	1/8"	1/4"	1/4"
8P	1/8"	1/4"	3/8"



10
Piece
Set



9
Piece
Set

Product Code	Description	Package
BURSET1#	10 pcs 1/8"	Plastic Case
BURSET5#	9 pcs 1/4"	Plastic Case

Ceramic Super Stones and Stone Holder



- Made from long ceramic fibres embedded in the thermoset resin.
- Exhibit superior strength compared to normal abrasive stones
- High tensile strength yet can be flexed without breaking
- Incomparable polishing ability, producing fine surface finish with minimal wear
- Used with ultrasonic polishers, offer aggressive stock removal

Product Code	Size	Grits	Colour
CSSEM102L	1 X 2 X 150	120	Emerald
CSSEM106L	1 X 6 X 150	120	Emerald
CSSEM110L	1 X 10 X 150	120	Emerald
CSSG102L	1 X 2 X 150	180	Gold
CSSG106L	1 X 6 X 150	180	Gold
CSSG110L	1 X 10 X 150	180	Gold
CSSLB102L	1 X 2 X 150	300	Light Brown
CSSLB106L	1 X 6 X 150	300	Light Brown
CSSLB110L	1 X 10 X 150	300	Light Brown
CSSOR102L	1 X 2 X 150	400	Orange
CSSOR106L	1 X 6 X 150	400	Orange
CSSOR110L	1 X 10 X 150	400	Orange
CSSBR102L	1 X 2 X 150	600	Brown
CSSBR106L	1 X 6 X 150	600	Brown
CSSBR110L	1 X 10 X 150	600	Brown
CSSB102L	1 X 2 X 150	800	Blue
CSSB106L	1 X 6 X 150	800	Blue
CSSB110L	1 X 10 X 150	800	Blue
CSSW102L	1 X 2 X 150	1000	White
CSSW106L	1 X 6 X 150	1000	White
CSSW110L	1 X 10 X 150	1000	White
CSSR102L	1 X 2 X 150	1200	Red
CSSR106L	1 X 6 X 150	1200	Red
CSSR110L	1 X 10 X 150	1200	Red



Product Code	Description
SSH2	Holder to suit 2mm stones
SSH6	Holder to suit 6mm stones
SSH10	Holder to suit 10mm stones



AM2 Polishing Stone

Most popular all-round finishing stone, suitable for all types of mould & die steels.
Grits: 100, 150, 180, 220, 320, 400, 600, 900

Product Code	Description	Grits
AM21818150	1/8 X 1/8 X 150 Am2 Stone	150#
AM21818220	1/8 X 1/8 X 220 Am2 Stone	220#
AM21818320	1/8 X 1/8 X 320 Am2 Stone	320#
AM21818400	1/8 X 1/8 X 400 Am2 Stone	400#
AM21818600	1/8 X 1/8 X 600 Am2 Stone	600#
AM21814150	1/8 X 1/4 X 150 Am2 Stone	150#
AM21814220	1/8 X 1/4 X 220 Am2 Stone	220#
AM21814320	1/8 X 1/4 X 320 Am2 Stone	320#
AM21814400	1/8 X 1/4 X 400 Am2 Stone	400#
AM21814600	1/8 X 1/4 X 600 Am2 Stone	600#
AM21814150	1/8 X 1/4 X 150 Am2 Stone	150#
AM21814220	1/8 X 1/4 X 220 Am2 Stone	220#
AM21814320	1/8 X 1/4 X 320 Am2 Stone	320#
AM21814400	1/8 X 1/4 X 400 Am2 Stone	400#
AM21814600	1/8 X 1/4 X 600 Am2 Stone	600#
AM21812100	1/8 X 1/2 X 100 Am2 Stone	100#
AM21812150	1/8 X 1/2 X 150 Am2 Stone	150#
AM21812220	1/8 X 1/2 X 220 Am2 Stone	220#
AM21812320	1/8 X 1/2 X 320 Am2 Stone	320#
AM21812400	1/8 X 1/2 X 400 Am2 Stone	400#
AM21812600	1/8 X 1/2 X 600 Am2 Stone	600#
AM21812900	1/8 X 1/2 X 900 Am2 Stone	900#
AM2181320	1/8 X 1 X 320 Am2 Stone	320#
AM2181400	1/8 X 1 X 400 Am2 Stone	400#
AM2181600	1/8 X 1 X 600 Am2 Stone	600#
AM21414100	1/4 X 1/4 X 100 Am2 Stone	100#
AM21414150	1/4 X 1/4 X 150 Am2 Stone	150#
AM21414180	1/4 X 1/4 X 180 Am2 Stone	180#
AM21414220	1/4 X 1/4 X 220 Am2 Stone	220#
AM21414320	1/4 X 1/4 X 320 Am2 Stone	320#
AM21414400	1/4 X 1/4 X 400 Am2 Stone	400#
AM21414600	1/4 X 1/4 X 600 Am2 Stone	600#
AM21414900	1/4 X 1/4 X 900 Am2 Stone	900#
AM21412100	1/4 X 1/2 X 100 Am2 Stone	100#
AM21412150	1/4 X 1/2 X 150 Am2 Stone	150#
AM21412180	1/4 X 1/2 X 180 Am2 Stone	180#
AM21412220	1/4 X 1/2 X 220 Am2 Stone	220#
AM21412320	1/4 X 1/2 X 320 Am2 Stone	320#
AM21412400	1/4 X 1/2 X 400 Am2 Stone	400#
AM21412600	1/4 X 1/2 X 600 Am2 Stone	600#
AM2141100	1/4 X 1 X 100 Am2 Stone	100#
AM2141150	1/4 X 1 X 150 Am2 Stone	150#
AM2141220	1/4 X 1 X 220 Am2 Stone	220#



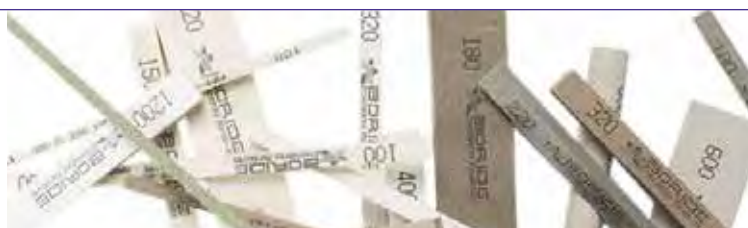
AM2 Polishing Stone

Most popular all-round finishing stone, suitable for all types of mould & die steels.

Grits: 100, 150, 180, 220, 320, 400, 600, 900

Product Code	Description	Grits
AM2141320	1/4 X 1 X 320 Am2 Stone	320#
AM2141400	1/4 X 1 X 400 Am2 Stone	400#
AM2141600	1/4 X 1 X 600 Am2 Stone	600#
AM23838150	3/8 X 3/8 X 150 Am2 Stone	150#
AM23838220	3/8 X 3/8 X 220 Am2 Stone	220#
AM21212100	1/2 X 1/2 X 100 Am2 Stone	100#
AM21212150	1/2 X 1/2 X 150 Am2 Stone	150#
AM21212220	1/2 X 1/2 X 220 Am2 Stone	220#
AM21212320	1/2 X 1/2 X 320 Am2 Stone	320#
AM21212400	1/2 X 1/2 X 400 Am2 Stone	400#
AM21212600	1/2 X 1/2 X 600 Am2 Stone	600#
AM2121100	1/2 X 1 X 100 Am2 Stone	100#
AM2121150	1/2 X 1 X 150 Am2 Stone	150#
AM2121220	1/2 X 1 X 220 Am2 Stone	220#
AM2121320	1/2 X 1 X 320 Am2 Stone	320#
AM2121400	1/2 X 1 X 400 Am2 Stone	400#
AM2121600	1/2 X 1 X 600 Am2 Stone	600#
AM211100	1 X 1 X 100 Am2 Stone	100#
AM211150	1 X 1 X 150 Am2 Stone	150#
AM211220	1 X 1 X 220 Am2 Stone	220#
AM211320	1 X 1 X 320 Am2 Stone	320#

Boride Polishing Stones - AM2 -Round



AM2 Polishing Stone - Round

Most popular all-round finishing stone, suitable for all types of mould & die steels.

Grits: 220 & 320

Product Code	Description	Grits
AM2-14R220	1/4 X 220 Am2 Round Stone	220#
AM2-14R320	1/4 X 320 Am2 Round Stone	320#
AM2-38R220	3/8 X 220 Am2 Round Stone	220#
AM2-38R320	3/8 X 320 Am2 Round Stone	320#
AM2-12R220	1/2 X 220 Am2 Round Stone	220#
AM2-12R320	1/2 X 320 Am2 Round Stone	320#



AM8 Polishing Stone

Removes EDM scale, suitable for all types of mould & die steels.

Grits: 100, 120, 150, 180, 220, 320, 400, 600

Product Code	Description	Grits
AM81814150	1/8 X 1/4 X 150 Am8 Stone	150#
AM81814220	1/8 X 1/4 X 220 Am8 Stone	220#
AM81814320	1/8 X 1/4 X 320 Am8 Stone	320#
AM81814400	1/8 X 1/4 X 400 Am8 Stone	400#
AM81814600	1/8 X 1/4 X 600 Am8 Stone	600#
AM81812100	1/8 X 1/2 X 100 Am8 Stone	100#
AM81812120	1/8 X 1/2 X 120 Am8 Stone	120#
AM81812150	1/8 X 1/2 X 150 Am8 Stone	150#
AM81812220	1/8 X 1/2 X 220 Am8 Stone	220#
AM81812320	1/8 X 1/2 X 320 Am8 Stone	320#
AM81812400	1/8 X 1/2 X 400 Am8 Stone	400#
AM81812600	1/8 X 1/2 X 600 Am8 Stone	600#
AM81414100	1/4 X 1/4 X 100 Am8 Stone	100#
AM81414150	1/4 X 1/4 X 150 Am8 Stone	150#
AM81414220	1/4 X 1/4 X 220 Am8 Stone	220#
AM81414320	1/4 X 1/4 X 320 Am8 Stone	320#
AM81414400	1/4 X 1/4 X 400 Am8 Stone	400#
AM81414600	1/4 X 1/4 X 600 Am8 Stone	600#
AM81412100	1/4 X 1/2 X 100 Am8 Stone	100#
AM81412120	1/4 X 1/2 X 120 Am8 Stone	120#
AM81412150	1/4 X 1/2 X 150 Am8 Stone	150#
AM81412220	1/4 X 1/2 X 220 Am8 Stone	220#
AM81412320	1/4 X 1/2 X 320 Am8 Stone	320#
AM81412400	1/4 X 1/2 X 400 Am8 Stone	400#
AM81412600	1/4 X 1/2 X 600 Am8 Stone	600#

Boride Polishing Stones - CS



CS Polishing Stone Fast cutting black silicone carbide general purpose polishing stone, used on all tool steels as well as used for roughing out on non-ferrous materials. Grits: 100, 120, 150, 180, 220, 320, 400, 600

Product Code	Description	Grits	Product Code	Description	Grits
CS1814150	1/8 X 1/4 X 150 CS Stone	150#	CS1414400	1/4 X 1/4 X 400 CS Stone	400#
CS1812150	1/8 X 1/2 X 150 CS Stone	150#	CS1412150	1/4 X 1/2 X 150 CS Stone	150#
CS1812180	1/8 X 1/2 X 220 CS Stone	220#	CS1412220	1/4 X 1/2 X 220 CS Stone	220#
CS1812320	1/8 X 1/2 X 320 CS Stone	320#	CS1412320	1/4 X 1/2 X 320 CS Stone	320#
CS1812400	1/8 X 1/2 X 400 CS Stone	400#	CS1212150	1/2 X 1/2 X 150 CS Stone	150#
CS1812600	1/8 X 1/2 X 600 CS Stone	600#	CS1212220	1/2 X 1/2 X 220 CS Stone	220#
CS1414150	1/4 X 1/4 X 150 CS Stone	150#	CS1212320	1/2 X 1/2 X 320 CS Stone	320#
CS1414320	1/4 X 1/4 X 320 CS Stone	320#	CS11600-M	1 X 1 X 600 CS Stone	600#



T2 Polishing Stone is a medium-hard aluminium oxide stone that cuts very fast yet provides a silky smooth finish on quality mould steel such as P-20, H-13 & 420
Grits: 150, 220, 320, 400, 600

Product Code	Description	Grits
T21814150	1/8 X 1/4 X 150 T2 Stone	150#
T21814220	1/8 X 1/4 X 220 T2 Stone	220#
T21812150	1/8 X 1/2 X 150 T2 Stone	150#
T21812220	1/8 X 1/2 X 220 T2 Stone	220#
T21414150	1/4 X 1/4 X 150 T2 Stone	150#
T21414220	1/4 X 1/4 X 220 T2 Stone	220#
T21414320	1/4 X 1/4 X 320 T2 Stone	320#
T21414400	1/4 X 1/4 X 400 T2 Stone	400#
T21414600	1/4 X 1/4 X 600 T2 Stone	600#
T21412150	1/4 X 1/2 X 150 T2 Stone	150#
T21412220	1/4 X 1/2 X 220 T2 Stone	220#
T21412320	1/4 X 1/2 X 320 T2 Stone	320#
T21412400	1/4 X 1/2 X 400 T2 Stone	400#
T21412600	1/4 X 1/2 X 600 T2 Stone	600#

Polishing Lubricant



For mould polishing to clean, lubricate and prevent stone loading.
Water based, odour free and easy to clean.

Product Code	Size
ABORI-LARGE	1 Gallon (3.78 L)

Combination Stone



Aluminium oxide combination stone with a fine side for finishing
and a coarse side for re-grinding.

Product Code	Size - inches	Material
COMSTONE-S	5/8" x 1 5/8" x 4 1/2"	Aluminium Oxide
COMSTONE-L	1" x 2" x 8"	Aluminium Oxide



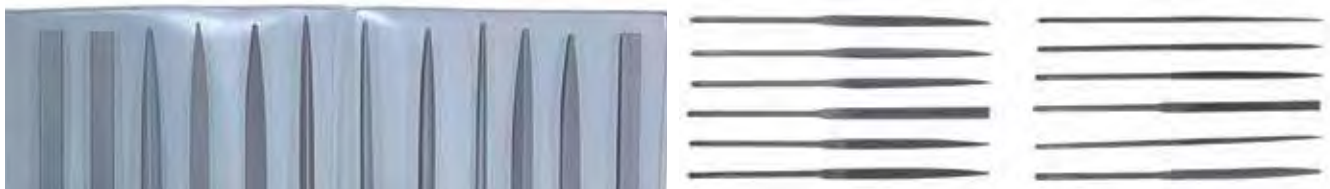
Product Code	Description	Shank Dia.	Overall Length
DFILE1	Square Diamond Needle File	3mm	140mm
DFILE2	Half Round Diamond Needle File	3mm	140mm
DFILE3	Triangular Diamond Needle File	3mm	140mm
DFILE4	Flat Diamond Needle File	3mm	140mm
DFILE5	Round Diamond Needle File	3mm	140mm
DFILE6	Knife Diamond Needle File	3mm	140mm
DFILE7	Lozenge Diamond Needle File	3mm	140mm
DFILE9	Oval Diamond Needle File	3mm	140mm

Diamond Riffler File Set



Product Code	Description
DR	10 pc Set in Plastic Pouch

Hand Needle File Set



Product Code	Description
NFS	12 pc Set in Plastic Pouch



Product Code	Description	Length
WF061	Smooth Flat File	6"
WF062	2nd Cut Flat File	6"
WF063	Bastard Flat File	6"
WF081	Smooth Flat File	8"
WF082	2nd Cut Flat File	8"
WF083	Bastard Flat File	8"

Product Code	Description	Length
WF101	Smooth Flat File	10"
WF102	2nd Cut Flat File	10"
WF103	Bastard Flat File	10"
WF121	Smooth Flat File	12"
WF122	2nd Cut Flat File	12"
WF123	Bastard Flat File	12"

Hand File



Product Code	Description	Length
WH061	Smooth Hand File	6"
WH062	2nd Cut Hand File	6"
WH063	Bastard Hand File	6"
WH081	Smooth Hand File	8"
WH082	2nd Cut Hand File	8"
WH083	Bastard Hand File	8"

Product Code	Description	Length
WH101	Smooth Hand File	10"
WH102	2nd Cut Hand File	10"
WH103	Bastard Hand File	10"
WH121	Smooth Hand File	12"
WH122	2nd Cut Hand File	12"
WH123	Bastard Hand File	12"

Half Round File



Product Code	Description	Length
WZ041	Smooth Half Round File	4"
WZ042	2nd Cut Half Round File	4"
WZ043	Bastard Half Round File	4"
WZ061	Smooth Half Round File	6"
WZ062	2nd Cut Half Round File	6"
WZ063	Bastard Half Round File	6"
WZ081	Smooth Half Round File	8"
WZ082	2nd Cut Half Round File	8"

Product Code	Description	Length
WZ083	Bastard Half Round File	8"
WZ101	Smooth Half Round File	10"
WZ102	2nd Cut Half Round File	10"
WZ103	Bastard Half Round File	10"
WZ121	Smooth Half Round File	12"
WZ122	2nd Cut Half Round File	12"
WZ123	Bastard Half Round File	12"



Product Code	Description	Length
WT061	Smooth 3 Square File	6"
WT062	2nd Cut 3 Square File	6"
WT082	2nd Cut 3 Square File	8"

Square Hand File



Product Code	Description	Length
WS061	Smooth Square File	6"
WS062	2nd Cut Square File	6"
WS063	Bastard Square File	6"
WS081	Smooth Square File	8"
WS082	2nd Cut Square File	8"
WS083	Bastard Square File	8"

Product Code	Description	Length
WS101	Smooth Square File	10"
WS102	2nd Cut Square File	10"
WS103	Bastard Square File	10"
WS121	Smooth Square File	12"
WS122	2nd Cut Square File	12"
WS123	Bastard Square File	12"

Round Hand File



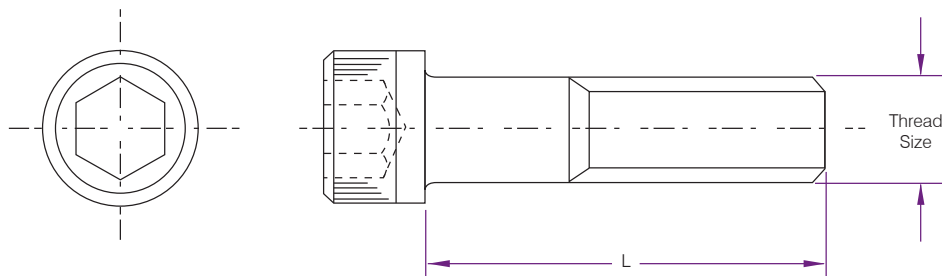
Product Code	Description	Length
WR061	Smooth Round File	6"
WR062	2nd Cut Round File	6"
WR063	Bastard Round File	6"
WR081	Smooth Round File	8"
WR082	2nd Cut Round File	8"
WR083	Bastard Round File	8"

Product Code	Description	Length
WR101	Smooth Round File	10"
WR102	2nd Cut Round File	10"
WR103	Bastard Round File	10"
WR121	Smooth Round File	12"
WR122	2nd Cut Round File	12"
WR123	Bastard Round File	12"

Plastic Handles for Hand Files



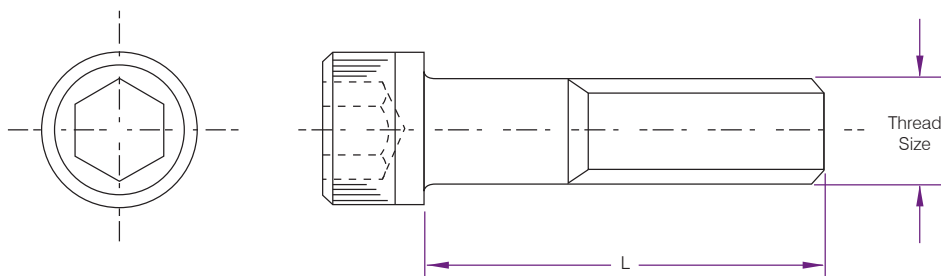
Product Code	Description	Length
WT061	Suits 4 inch-6 inch files	4"
WT062	Suits 8 inch-10 inch files	5"
WT082	Suits 10 inch-12 inch files	8"



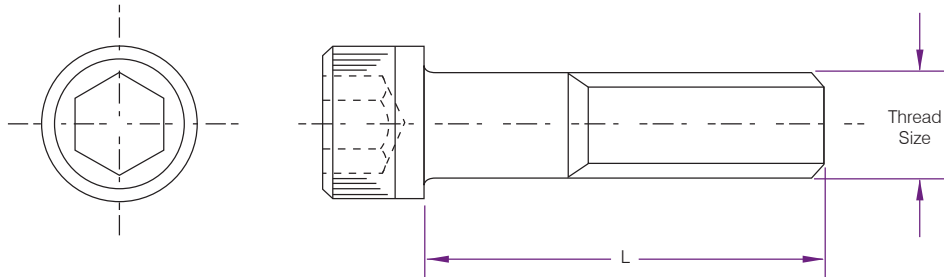
METRIC						
Length	M2	M3	M4	M5	M6	M8
5		UCAP3M05	UCAP4M05			
6		UCAP3M06	UCAP4M06	UCAP5M06		
8		UCAP3M08	UCAP4M08	UCAP5M08	UCAP6M08	
10		UCAP3M10	UCAP4M10	UCAP5M10	UCAP6M10	UCAP8M10
12	UCAP2M12	UCAP3M12	UCAP4M12	UCAP5M12	UCAP6M12	UCAP8M12
16		UCAP3M16	UCAP4M16	UCAP5M16	UCAP6M16	UCAP8M16
20		UCAP3M20	UCAP4M20	UCAP5M20	UCAP6M20	UCAP8M20
25		UCAP3M25	UCAP4M25	UCAP5M25	UCAP6M25	UCAP8M25
30		UCAP3M30	UCAP4M30	UCAP5M30	UCAP6M30	UCAP8M30
35		UCAP3M35	UCAP4M35	UCAP5M35	UCAP6M35	UCAP8M35
40			UCAP4M40	UCAP5M40	UCAP6M40	UCAP8M40
45			UCAP4M45	UCAP5M45	UCAP6M45	UCAP8M45
50			UCAP4M50	UCAP5M50	UCAP6M50	UCAP8M50
55				UCAP5M55	UCAP6M55	UCAP8M55
60				UCAP5M60	UCAP6M60	UCAP8M60
65				UCAP5M65	UCAP6M65	UCAP8M65
70				UCAP5M70	UCAP6M70	UCAP8M70
75					UCAP6M75	UCAP8M75
80				UCAP5M80	UCAP6M80	UCAP8M80
90				UCAP5M90	UCAP6M90	UCAP8M90
100					UCAP6M100	UCAP8M100
110					UCAP6M110	UCAP8M110
120					UCAP6M120	UCAP8M120
130						UCAP8M130
140					UCAP6M140	UCAP8M140
150						UCAP8M150
160						UCAP8M160
180						UCAP8M180



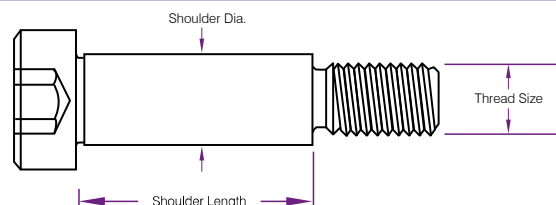
METRIC					
Length	M10	M12	M14	M16	M18
10	UCAP10M10				
12	UCAP10M12	UCAP12M12			
16	UCAP10M16	UCAP12M16			
20	UCAP10M20	UCAP12M20			
25	UCAP10M25	UCAP12M25	UCAP14M25	UCAP16M25	
30	UCAP10M30	UCAP12M30	UCAP14M30	UCAP16M30	
35	UCAP10M35	UCAP12M35	UCAP14M35	UCAP16M35	
40	UCAP10M40	UCAP12M40	UCAP14M40	UCAP16M40	
45	UCAP10M45	UCAP12M45	UCAP14M45	UCAP16M45	
50	UCAP10M50	UCAP12M50	UCAP14M50	UCAP16M50	UCAP18M50
55	UCAP10M55	UCAP12M55	UCAP14M55	UCAP16M55	
60	UCAP10M60	UCAP12M60	UCAP14M60	UCAP16M60	
65	UCAP10M65	UCAP12M65	UCAP14M65	UCAP16M65	
70	UCAP10M70	UCAP12M70	UCAP14M70	UCAP16M70	
75	UCAP10M75	UCAP12M75	UCAP14M75	UCAP16M75	
80	UCAP10M80	UCAP12M80	UCAP14M80	UCAP16M80	
90	UCAP10M90	UCAP12M90	UCAP14M90	UCAP16M90	
100	UCAP10M100	UCAP12M100	UCAP14M100	UCAP16M100	
110	UCAP10M110	UCAP12M110	UCAP14M110	UCAP16M110	
120	UCAP10M120	UCAP12M120	UCAP14M120	UCAP16M120	
130	UCAP10M130	UCAP12M130	UCAP14M130	UCAP16M130	
140	UCAP10M140	UCAP12M140	UCAP14M140	UCAP16M140	
150	UCAP10M150	UCAP12M150	UCAP14M150	UCAP16M150	
160	UCAP10M160	UCAP12M160	UCAP14M160	UCAP16M160	
170	UCAP10M170	UCAP12M170	UCAP14M170	UCAP16M170	
180	UCAP10M180	UCAP12M180	UCAP14M180	UCAP16M180	
190	UCAP10M190	UCAP12M190	UCAP14M190	UCAP16M190	
200	UCAP10M200	UCAP12M200	UCAP14M200	UCAP16M200	
220		UCAP12M220	UCAP14M220	UCAP16M220	
230		UCAP12M230	UCAP14M230		
240		UCAP12M240		UCAP16M240	
250		UCAP12M250	UCAP14M250	UCAP16M250	
260				UCAP16M260	
300			UCAP14M300	UCAP16M300	
320			UCAP14M320		
340			UCAP14M2340		



METRIC						
Length	M20	M22	M24	M27	M30	M36
30	UCAP20M30					
35	UCAP20M35					
40	UCAP20M40		UCAP24M40			
45	UCAP20M45		UCAP24M45			
50	UCAP20M50		UCAP24M50			
55	UCAP20M55		UCAP24M55			
60	UCAP20M60		UCAP24M60			
65	UCAP20M65		UCAP24M65			
70	UCAP20M70		UCAP24M70			
75	UCAP20M75		UCAP24M75			
80	UCAP20M80		UCAP24M80	UCAP27M80	UCAP30M80	UCAP36M80
90	UCAP20M90		UCAP24M90	UCAP27M90	UCAP30M90	UCAP36M90
100	UCAP20M100		UCAP24M100	UCAP27M100	UCAP30M100	UCAP36M100
110	UCAP20M110	UCAP22M110	UCAP24M110	UCAP27M110	UCAP30M110	UCAP36M110
120	UCAP20M120		UCAP24M120	UCAP27M120	UCAP30M120	UCAP36M120
130	UCAP20M130	UCAP22M130	UCAP24M130		UCAP30M130	UCAP36M130
140	UCAP20M140		UCAP24M140	UCAP27M140	UCAP30M140	UCAP36M140
150	UCAP20M150		UCAP24M150	UCAP27M150	UCAP30M150	UCAP36M150
160	UCAP20M160		UCAP24M160		UCAP30M160	
180	UCAP20M180		UCAP24M180	UCAP27M180	UCAP30M180	UCAP36M180
200	UCAP20M200		UCAP24M200	UCAP27M200	UCAP30M200	UCAP36M200
220	UCAP20M220		UCAP24M220		UCAP30M220	
240	UCAP20M240		UCAP24M240		UCAP30M240	UCAP36M240
260	UCAP20M260		UCAP24M260		UCAP30M260	UCAP36M260
280	UCAP20M280		UCAP24M280		UCAP30M280	UCAP36M280
300	UCAP20M300		UCAP24M300		UCAP30M300	UCAP36M300
320			UCAP24M320		UCAP30M320	
340			UCAP24M340		UCAP30M340	
360					UCAP30M360	



IMPERIAL									
Length	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1"
1/4		UCAP31614	UCAP1414						
3/8	UCAP1838	UCAP31638	UCAP1438	UCAP51638					
1/2	UCAP1812	UCAP31612	UCAP1412	UCAP51612	UCAP3812		UCAP5812	UCAP3412	
5/8		UCAP31658	UCAP1458	UCAP51658	UCAP3858	UCAP1258			
3/4	UCAP1834	UCAP31634	UCAP1434	UCAP51634	UCAP3834	UCAP1234			
7/8			UCAP1478	UCAP51678					
1	UCAP181	UCAP3161	UCAP141	UCAP5161	UCAP381	UCAP121	UCAP581		
1 1/4		UCAP316114	UCAP14114	UCAP516114	UCAP38114	UCAP12114	UCAP58114	UCAP34114	
1 1/2		UCAP316112	UCAP14112	UCAP51614	UCAP38112	UCAP12112	UCAP58112	UCAP34112	UCAP1112
1 3/4		UCAP316134	UCAP14134	UCAP516134	UCAP38134	UCAP12134	UCAP58134	UCAP34134	
2		UCAP3162	UCAP142	UCAP5162	UCAP382	UCAP122	UCAP582	UCAP342	UCAP12
2 1/4			UCAP14214	UCAP516214	UCAP38214	UCAP12214	UCAP58214	UCAP34214	
2 1/2		UCAP316212	UCAP14212	UCAP516212	UCAP38212	UCAP12212	UCAP58212	UCAP34212	UCAP1212
2 3/4			UCAP14234	UCAP516234	UCAP38234	UCAP12234			
3			UCAP143	UCAP5163	UCAP383	UCAP123	UCAP583	UCAP343	UCAP13
3 1/4			UCAP14314	UCAP516314	UCAP38314	UCAP12314			
3 1/2			UCAP14312	UCAP516312	UCAP38312	UCAP12312	UCAP58312	UCAP34312	UCAP1312
4			UCAP144	UCAP5164	UCAP384	UCAP124	UCAP584	UCAP344	UCAP14
4 1/2				UCAP516412	UCAP38412	UCAP12412	UCAP58412	UCAP34412	
5					UCAP385	UCAP125	UCAP585	UCAP345	UCAP15
5 1/2					UCAP38512	UCAP12512	UCAP58512	UCAP34512	
6					UCAP386	UCAP126	UCAP586	UCAP346	UCAP16
6 1/2						UCAP12612	UCAP58612	UCAP34612	
7						UCAP127	UCAP587	UCAP347	UCAP17
8						UCAP128	UCAP588	UCAP348	UCAP18
9								UCAP349	UCAP19



METRIC							
Shoulder Length	Shoulder Dia. (Thread Size)						
	6mm (M5)	8mm (M6)	10mm (M8)	12mm (M10)	16mm (M12)	20mm (M16)	24mm (M20)
10	USS6M10						
12	USS6M12	USS8M12	USS10M12				
16	USS6M16	USS8M16	USS10M16	USS12M16			
20	USS6M20	USS8M20	USS10M20	USS12M20	USS16M20		
25	USS6M25	USS8M25	USS10M25	USS12M25			
30	USS6M30	USS8M30	USS10M30	USS12M30	USS16M30		
35		USS8M35					
40	USS6M40	USS8M40	USS10M40	USS12M40	USS16M40	USS20M40	
50	USS6M50	USS8M50	USS10M50	USS12M50	USS16M50	USS20M50	USS24M50
60	USS6M60	USS8M60	USS10M60	USS12M60	USS16M60	USS20M60	USS24M60
70		USS8M70	USS10M70	USS12M70	USS16M70	USS20M70	USS24M70
80			USS10M80	USS12M80	USS16M80	USS20M80	USS24M80
90				USS12M90	USS16M90	USS20M90	USS24M90
100					USS16M100	USS20M100	USS24M100
120					USS16M120	USS20M120	USS24M120
140							

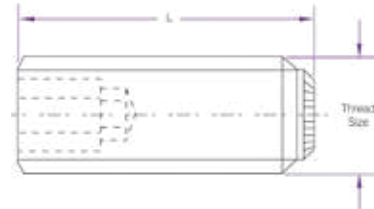
IMPERIAL						
Shoulder Length	Shoulder Dia. (Thread Size)					
	1/4 (3/16)	5/16 (1/4)	3/8 (5/16)	1/2 (3/8)	5/8 (1/2)	3/4 (5/8)
3/8	USS1438	USS51638				
1/2	USS1412	USS51612	USS3812	USS1212		
5/8		USS51658	USS3858	USS1258		
3/4	USS1434	USS51634	USS3834	USS1234		
1	USS141	USS5161	USS381	USS121		
1 1/4	USS14114	USS516114	USS38114	USS12114	USS58114	
1 1/2	USS14112	USS516112	USS38112	USS12112	USS58112	USS34112
1 3/4		USS516134	USS38134	USS12134	USS58134	USS34134
2	USS142	USS5162	USS382	USS122	USS582	USS342
2 1/4		USS516214	USS38214	USS12214	USS58214	USS34214
2 1/2		USS516212	USS38212	USS12212	USS58212	USS34212
2 3/4			USS38234	USS12234	USS58234	USS34234
3			USS383	USS123	USS583	USS343
3 1/4			USS38314	USS12314		
3 1/2			USS38312	USS12312	USS58312	USS34312
4			USS384	USS124	USS584	USS344
4 1/2				USS12412	USS58412	USS34412
4 1/4				USS34414		
5				USS125	USS585	USS345
6						USS346



METRIC										
Length	M3	M4	M5	M6	M8	M10	M12	M16	M20	M24
6	UCS3M06									
8	UCS3M08	UCS4M08	UCS5M08							
10	UCS3M10	UCS4M10	UCS5M10	UCS6M10	UCS8M10					
12	UCS3M12	UCS4M12	UCS5M12	UCS6M12	UCS8M12	UCS10M12				
16	UCS3M16	UCS4M16	UCS5M16	UCS6M16	UCS8M16	UCS10M16	UCS12M16			
20	UCS3M20	UCS4M20	UCS5M20	UCS6M20	UCS8M20	UCS10M20				
25	UCS3M25	UCS4M25	UCS5M25	UCS6M25	UCS8M25	UCS10M25	UCS12M25			
30	UCS3M30	UCS4M30	UCS5M30	UCS6M30	UCS8M30	UCS10M30	UCS12M30	UCS16M30		
35		UCS4M35	UCS5M35	UCS6M35	UCS8M35	UCS10M35	UCS12M35	UCS16M35	UCS20M35	
40		UCS4M40	UCS5M40	UCS6M40	UCS8M40	UCS10M40	UCS12M40	UCS16M40		
45			UCS5M45	UCS6M45	UCS8M45	UCS10M45	UCS12M45	UCS16M45	UCS20M45	
50			UCS5M50	UCS6M50	UCS8M50	UCS10M50	UCS12M50	UCS16M50		
55					UCS8M55	UCS10M55	UCS12M55	UCS16M55	UCS20M55	
60					UCS8M60	UCS10M60	UCS12M60	UCS16M60	UCS20M60	UCS24M60
70					UCS8M70	UCS10M70	UCS12M70	UCS16M70	UCS20M70	UCS24M70
80						UCS10M80	UCS12M80	UCS16M80	UCS20M80	UCS24M80
90						UCS10M90	UCS12M90	UCS16M90	UCS20M90	UCS24M90
100						UCS10M100	UCS12M100	UCS16M100	UCS20M100	UCS24M100
120								UCS16M120	UCS20M120	UCS24M120
140								UCS16M140	UCS20M140	UCS24M140
160								UCS16M160		

IMPERIAL						
Length	3/16	1/4	5/16	3/8	1/2	5/8
3/8	UCS31638	UCS1438				
1/2	UCS31612	UCS1412	UCS51612	UCS3812		
5/8	UCS31658	UCS1458	UCS51658	UCS3858		
3/4	UCS31634	UCS1434	UCS51634	UCS3834	UCS1234	
1	UCS3161	UCS141	UCS5161	UCS381	UCS121	UCS581
1 1/4	UCS316114	UCS14114	UCS516114	UCS38114	UCS12114	
1 1/2	UCS316112	UCS14112	UCS516112	UCS38112	UCS12112	UCS58112
1 3/4		UCS14134	UCS516134	UCS38134	UCS12134	UCS58134
2		UCS142	UCS5162	UCS382	UCS122	UCS582
2 1/2		UCS14212	UCS516212	UCS38212	UCS12212	UCS58212
3				UCS383	UCS123	UCS583
3 1/2						UCS58312
4						UCS584

Knurled Cup Point



METRIC					
Length	M3	M4	M5	M6	M8
3	USET3M03				
4	USET3M04	USET4M04			
5	USET3M05	USET4M05	USET5M05		
6	USET3M06	USET4M06	USET5M06	USET6M06	
8	USET3M08	USET4M08	USET5M08	USET6M08	USET8M08
10	USET3M10	USET4M10	USET5M10	USET6M10	USET8M10
12	USET3M12	USET4M12	USET5M12	USET6M12	USET8M12
16	USET3M16	USET4M16	USET5M16	USET6M16	USET8M16
20		USET4M20	USET5M20	USET6M20	USET8M20
25		USET4M25	USET5M25	USET6M25	USET8M25
30			USET5M30	USET6M30	USET8M30
35				USET6M35	USET8M35
40				USET6M40	USET8M40
45				USET6M45	USET8M45
50				USET6M50	USET8M50

METRIC					
Length	M10	M12	M16	M20	M24
10	USET10M10				
12	USET10M12	USET12M12			
16	USET10M16	USET12M16	USET16M16		
20	USET10M20	USET12M20	USET16M20	USET20M20	
25	USET10M25	USET12M25	USET16M25	USET20M25	USET24M25
30	USET10M30	USET12M30	USET16M30	USET20M30	USET24M30
35	USET10M35	USET12M35	USET16M35	USET20M35	USET24M35
40	USET10M40	USET12M40	USET16M40	USET20M40	USET24M40
45	USET10M45	USET12M45	USET16M45		
50	USET10M50	USET12M50	USET16M50	USET20M50	USET24M50
60		USET12M60	USET16M60	USET20M60	USET24M60

IMPERIAL							
Length	3/16	1/4	5/16	3/8	1/2	5/8	3/4
3/16	USET316316						
1/4	USET31614	USET1414	USET51614				
5/16		USET14516	USET516516	USET38516			
3/8		USET1438	USET51638	USET3838			
1/2	USET31612	USET1412	USET51612	USET3812	USET1212		
5/8			USET51658	USET3858	USET1258	USET5858	
3/4		USET1434		USET3834	USET1234	USET5834	USET3434
7/8					USET1278		
1		USET141	USET5161	USET381	USET121	USET581	USET341
1 1/4					USET12114	USET58114	
1 1/2			USET516112	USET38112	USET12112	USET58112	USET34112
1 3/4						USET58134	
2					USET122	USET582	USET342
2 1/2					USET12212		USET34212



IMPERIAL		
Size	Short Arm	Long Arm
1.5	UMWS015	UMWL015
2	UMWS02	UMWL02
2.5	UMWS025	UMWL025
3	UMWS03	UMWL03
4	UMWS04	UMWL04
5	UMWS05	UMWL05
6	UMWS06	UMWL06
8	UMWS08	UMWL08
10	UMWS10	UMWL10
12	UMWS12	UMWL12
14	UMWS14	UMWL14
17	UMWS17	UMWL17
19	UMWS19	UMWL19

Allen Keys (Hexagon Wrench) - Imperial



IMPERIAL		
Size	Short Arm	Long Arm
1/16	UWS04	UWL04
5/64	UWS05	UWL05
3/32	UWS06	UWL06
7/64	UWS07	UWL07
1/8	UWS08	UWL08
9/64	UWS09	UWL09
5/32	UWS10	UWL10
3/16	UWS12	UWL12
7/32	UWS14	UWL14
1/4	UWS16	UWL16
5/16	UWS20	UWL20
3/8	UWS24	UWL24
7/16	UWS28	UWL28
1/2	UWS32	UWL32
9/16	UWS36	UWL36
5/8	UWS40	UWL40



Product Code	Description
BONDHUS-HEX-METRIC	9 PCS SET (LONG): 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10MM
BONDHUS-HEX-IMPERIAL	13 PCS SET (LONG): 0.050, 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 3/16, 7/32, 1/4, 5/16, 3/8"
BONDHUS-B-END-METRIC	9 PCS SET: 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10MM
BONDHUS-B-END-IMPERIAL	13 PCS SET: 0.050, 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 3/16, 7/32, 1/4, 5/16, 3/8"
BONDHUS-T-HANDLE-METRIC	8 PCS SET WITH STAND: 2, 2.5, 3, 4, 5, 6, 8, 10MM

Tapped Dowel Pins - Metric



METRIC (Thread Size)							
Length	6mm (M4)	8mm (M5)	10mm (M5)	12mm (M6)	13mm (M8)	16mm (M8)	20mm (M10)
20	UDT6M20	UDT8M20					
24	UDT6M24						
25		UDT8M25	UDT10M25				
30	UDT6M30	UDT8M30	UDT10M30	UDT12M30			
35	UDT6M35	UDT8M35					
36	UDT6M36	UDT8M36	UDT10M36				
40	UDT6M40	UDT8M40	UDT10M40	UDT12M40		UDT16M40	
45				UDT12M45		UDT16M45	
50	UDT6M50	UDT8M50	UDT10M50	UDT12M50	UDT13M50	UDT16M50	UDT20M50
55							
60		UDT8M60	UDT10M60	UDT12M60		UDT16M60	UDT20M60
70			UDT10M70	UDT12M70		UDT16M70	
80			UDT10M80	UDT12M80		UDT16M80	UDT20M80
90						UDT16M90	UDT20M90
100						UDT16M100	UDT20M100

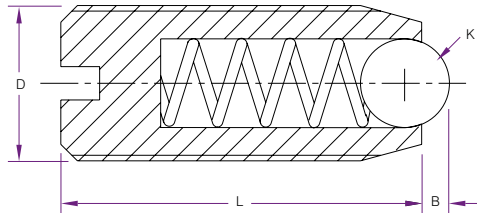


METRIC									
Length	M3	M4	M5	M6	M8	M10	M12	M16	M20
10	UD3M10	UD4M10							
12	UD3M12	UD4M12	UD5M12	UD6M12					
15		UD4M15							
16	UD3M16		UD5M16	UD6M16	UD8M16				
18	UD3M18								
20	UD3M20	UD4M20	UD5M20	UD6M20	UD8M20	UD10M20	UD12M20		
25	UD3M25	UD4M25	UD5M25	UD6M25	UD8M25	UD10M25	UD12M25		
30	UD3M30	UD4M30	UD5M30	UD6M30	UD8M30	UD10M30	UD12M30		
35		UD4M35	UD5M35	UD6M35	UD8M35		UD12M35		
40		UD4M40	UD5M40	UD6M40	UD8M40	UD10M40	UD12M40	UD16M40	
50		UD4M50	UD5M50	UD6M50	UD8M50	UD10M50	UD12M50	UD16M50	UD20M50
60				UD6M60	UD8M60	UD10M60	UD12M60	UD16M60	UD20M60
70				UD6M70	UD8M70	UD10M70	UD12M70	UD16M70	UD20M70
80						UD10M80	UD12M80	UD16M80	UD20M80
90							UD12M90	UD16M90	
100						UD10M100	UD12M100	UD16M100	UD20M100
120									UD20M120

Standard Dowel Pins - Imperial

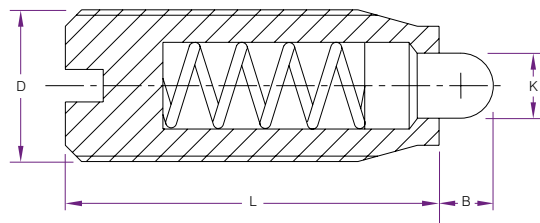


IMPERIAL						
Length	1/8	3/16	1/4	5/16	3/8	1/2
3/8	UD1838					
1/2	UD1812	UD31612	UD1412	UD51612	UD3812	
5/8	UD1858	UD31658				
3/4	UD1834	UD31634	UD1434	UD51634	UD3834	UD1234
1	UD181	UD3161	UD141	UD5161	UD381	UD121
1 1/4	UD18114	UD16114	UD14114	UD516114	UD38114	UD12114
1 1/2	UD18112	UD316112	UD14112	UD516112	UD38112	UD12112
1 3/4	UD18134	UD16134	UD14134	UD516134	UD38134	UD12134
2	UD182	UD3162	UD142	UD5162	UD382	UD122
2 1/4			UD14214	UD516214	UD38214	UD12214
2 1/2			UD14212	UD16212	UD38212	
3				UD5163	UD383	UD123
3 1/2						UD12312
4						UD124



Product Code	D	K	B	L
RAM04	M4	2.5	0.8	9.0
RAM05	M5	3.0	0.9	12
RAM06	M6	3.5	1.0	14
RAM08	M8	5.0	1.5	16
RAM10	M10	6.0	2.0	19
RAM12	M12	8.0	2.5	22
RAM16	M16	10	3.5	24

Pin Plungers



Product Code	D	K	B	L
RBM04	M4	1.5	1.5	15
RBM05	M5	2.4	2.3	18
RBM06	M6	2.7	2.5	20
RBM08	M8	3.5	3	22
RBM10	M10	4	3	22
RBM12	M12	6	4	28
RBM16	M16	7.5	5	32



Sumitomo Premium Brass EDM Wire

Produces superior results on virtually any wire EDM machine. Manufactured from high purity brass, Sumitomo SBS EDM Wire offers reliability, high performance and value for money.

Product Code	Size	Type
EDMW20HP3	0.20 x 3Kg	SBS Hard EDM Wire P3 Spool
EDMW25AP3	0.25 x 3Kg	SBS Soft EDM Wire P3 Spool
EDMW25HP5	0.25 x 5Kg	SBS Hard EDM Wire P5 Spool
EDMW25H6DIN160	0.25 x 6Kg	SBS Hard EDM Wire DIN160 Spool
EDMW25HP10	0.25 x 10Kg	SBS Hard EDM Wire P10 Spool
EDMW25HP20	0.25 x 20Kg	SBS Hard EDM Wire P20 Spool

Specification	Hard	Soft
Composition (%) Cu/Zn	65/35	65/35
Tensile Strength (N/mm ²) 440 - 585	930-1080	440-585
Diameter Tolerance	±0.001	±0.001

EDM Wire - Standard Brass



Standard Brass EDM Wire

Hales Standard Brass EDM wire offers a low cost alternative. Suitable for all types of EDM machines and recommended for standard applications requiring good accuracy and surface finish.

Product Code	Size	Type
HW20X5HW	0.20 x 5Kg	Hard EDM Wire P5 Spool
HW25X5HW	0.25 x 5Kg	Hard EDM Wire P5 Spool
HW25X6HWP5	0.25 x 6Kg	Hard EDM Wire P5 Spool
HW25XDIN160H-6KG	0.25 x 6Kg	Hard EDM Wire DIN160 Spool

Specification	Hard
Composition (%) Cu/Zn	63/37
Tensile Strength (N/mm ²)	900
Diameter Tolerance	0/-0.002

60/40 Brass EDM Wire

Designed with greater stiffness making it ideal for all automatic wire threading applications.

60/40 Brass EDM Wire has similar chemical composition and characteristics as other high performance Japanese EDM Wires

Product Code	Size	Type
HW25X5H60/40	0.25 x 5Kg	Hard EDM Wire P5 Spool
HW25X6H60/40P5	0.25 x 6Kg	Hard EDM Wire P5 Spool
W25XDIN160H6040-6KG	0.25 x 6Kg	Hard EDM Wire DIN160 Spool

Specification	Hard
Composition (%) Cu/Zn	60/40
Tensile Strength (N/mm ²)	900
Diameter Tolerance	0/-0.002

**EDM Wire - Speedcut Gamma****Speedcut Gamma EDM Wire (Zinc Coated)**

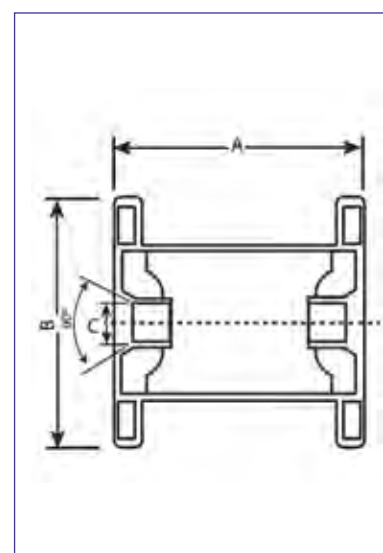
Speedcut Gamma is a new generation zinc coated EDM Wire that delivers high surface quality and increased speed up to 30% faster than regular brass wire.

Product Code	Size	Type
SPEEDCUTGAMMA.25-6KGP5	0.25 x 6Kg	Speedcut Gamma EDM Wire P5 Spool
SPEEDCUTGAM.25160DIN-8KG	0.25 x 8Kg	Speedcut Gamma EDM Wire DIN160 Spool
SPEEDCUTGAMMA.25-10KG	0.25 x 10Kg	Speedcut Gamma EDM Wire P0 Spool
SPEEDCUTGAMMA.25-16KG	0.25 x 16Kg	Speedcut Gamma EDM Wire DIN200 Spool
SPEEDCUTGAMMA.30-10KG	0.30 x 10Kg	Speedcut Gamma EDM Wire P10 Spool

Specification	Hard
Composition (%) Cu/Zn	63/37
Tensile Strength (N/mm ²)	900
Diameter Tolerance	0/-0.002

**EDM Wire - Spool Specifications**

Spool	A	B	C
DIN 125	125	125	16
DIN 160	160	160	22
DIN 200	200	200	22
P3	110	130	20
P5	115	160	20
P10	133	200	25
P15	140	250	35
P20	140	250	35



**EDM Water Filter**

Suits machine types: Agie, Charmille, Japax, Sodick

Product Code	Size	Type
FILW-01	150 X 32 X 355	EDM Water Filter

**EDM Water Filter**

Suits machine types: Agie, Charmille, Japax

Product Code	Size	Type
FILW-14P	150 X 31 X 375	EDM Water Filter

**EDM Water Filter**

Suits machine types: Brother, Mitsubishi

Product Code	Size	Type
FILW-20M	300 X 29 X 500	EDM Water Filter

**EDM Water Filter**

Suits machine type: Makino

Product Code	Size	Type
FILW-20N-05M	300 X 29 X 500	EDM Water Filter 5 Micron

**EDM Water Filter**

Suits machine types: Japax, Makino, Sodick

Product Code	Size	Type
FILW-23	260 X 46 X 280	EDM Water Filter

EDM Water Filter

Suits machine types: Fanuc, Sodick

Product Code	Size	Type
FILW-35CN	340 X 300	Central Nipple Edm Water Filter
FILW-35N	340 X 300	Nipple Edm Water Filter

**EDM Water Filter**

Suits machine types: Fanuc, Sodick

Product Code	Size	Type
FILW-35HP	340 X 46 X 300	Edm Water Filter

**EDM Water Filter**

Suits machine type: Sodick

Product Code	Size	Type
FILW-40N	340 X 450	Central Nipple Edm Water Filter

**EDM Water Filter**

Suits machine types: Sodick

Product Code	Size	Type
FILW-40SE	340 X 46 X 450	Edm Water Filter



EDM Wear Parts Available





Hales Resin is of high quality, specially formulated for the de-ionisation of water in wire EDM machines. This virgin resin offers many additional hours of service life over ordinary products.

Product Code	Size	Type
RESIN-25L BAG	25L Bag	Edion Long Life Resin
RESIN-25L BOX	25L Box (5 x 5L Bags)	Edion Long Life Resin

Rust Preventative



Hales EDM rust inhibitor reduces rust on work pieces and machines. This solution is environmentally safe, does not affect de-ionisation or filtration processes and will not cause valves to stick. Water concentrate: 1:200 (1/2%)

Product Code	Size	Type
FIL-HRI	5L Pail	Novotec Rust Inhibitor

EDM Wire Machine Cleaner



Hales B2000 - EDM Wire Machine Cleaner

- Removes rust, sludge and carbon immediately / that occurred on the guides, control box and work tank of wire cut machines.
- Removes rust and carbon on the work pieces
- Excellent on copper, stainless steel and aluminium
- Does not damage the shine of metallic surfaces and prevents yellowish discolouration
- Cleaning effect lasts for 1 - 2 months
- Possible to dilute and use.

Dilute Information:

- Rust occurring during production: 3 part Water to 1 part B-2000
- Components after 2-3 days of rust: 1 part Water to 1 part B-2000
- Old rust: Do Not dilute B-2000

Product Code	Size	Type
FIL-EDMCLEAN 5LT	5L Pail	EDM Cleaner

Hales EDM5 Fluid is a high quality solution with all the benefits that make it a superior product.

- High flash point and fire point that increase operator safety.
- Superior thermal stability, ensures low evaporation, long filter and fluid life, leading to reduced costs.
- Excellent filter-ability, allows rapid flushing of erosion debris, which, combined with low viscosity, enables high erosion rates with excellent surface finish.
- Crystal clear and low odour.

HALES EDM5-20	20L PAIL	EDM5 Fluid
HALES EDM5-205	205L Drum)	EDM5 Fluid



EDM Oil Filters

Hales stock a large range of high quality, long life and cost effective EDM filters for EDM wire cut and sinking machines.

FILE-09	260 X 46 X 280	EDM Oil Filter	Makino
FILE-12	150 X 72 X 450	EDM Oil Filter	Japax, Makino, Sodick
FILE-18	150 X 34 X 345	EDM Oil Filter	Hitachi, Mitsubishi
FILE-28	150 X 32 X 365	EDM Oil Filter	Agie, Chmer, Creator, Herless



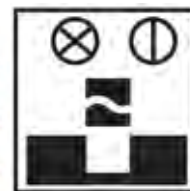


For EDM Electrodes

- The addition of tellurium to copper results in short clean chips
- Allows cutting speeds to increase by more than five times compared to using pure copper
- Excellent surface finish
- Less wear
- Increased tool life

Tellurium Copper comes in square, round and rectangular profiles.

Square			
Product Code	Type	Size	Available Lengths
TC11	Square	1" x 1"	Can Be Supplied Per Inch
TC22	Square	2" x 2"	Can Be Supplied Per Inch
TC212212	Square	2 1/2" x 2 1/2"	Can Be Supplied Per Inch
TC234234	Square	2 3/4" x 2 3/4"	Can Be Supplied Per Inch
TC44	Square	4" x 4"	Can Be Supplied Per Inch
Round			
Product Code	Type	Size - Dia.	Available Lengths
TC14R	Round	1/4"	48" lengths only
TC38R	Round	3/8"	48" lengths only
TC12R	Round	1/2"	48" lengths only
TC58R	Round	5/8"	24" or 48" lengths only
TC34R	Round	3/4"	24" or 48" lengths only
TC1R	Round	1"	Can Be Supplied Per Inch
TC114R	Round	1 1/4"	Can Be Supplied Per Inch
TC112R	Round	1 1/2"	Can Be Supplied Per Inch
TC2R	Round	2"	Can Be Supplied Per Inch
TC212R	Round	2 1/2"	Can Be Supplied Per Inch
TC3R	Round	3"	Can Be Supplied Per Inch
TC4R	Round	4"	Can Be Supplied Per Inch
TC6R	Round	6"	Can Be Supplied Per Inch
Rectangular			
Product Code	Type	Size	Available Length
TC3164	Rectangular	3/16" x 4"	Can Be Supplied Per Inch
TC143	Rectangular	1/4" x 3"	Can Be Supplied Per Inch
TC144	Rectangular	1/4" x 4"	Can Be Supplied Per Inch
TC146	Rectangular	1/4" x 6"	Can Be Supplied Per Inch
TC121	Rectangular	1/2" x 1"	Can Be Supplied Per Inch
TC122	Rectangular	1/2" x 2"	Can Be Supplied Per Inch
TC123	Rectangular	1/2" x 3"	Can Be Supplied Per Inch
TC124	Rectangular	1/2" x 4"	Can Be Supplied Per Inch
TC126	Rectangular	1/2" x 6"	Can Be Supplied Per Inch
TC342	Rectangular	3/4" x 2"	Can Be Supplied Per Inch
TC343	Rectangular	3/4" x 3"	Can Be Supplied Per Inch
TC344	Rectangular	3/4" x 4"	Can Be Supplied Per Inch
TC12	Rectangular	1" x 2"	Can Be Supplied Per Inch
TC13	Rectangular	1" x 3"	Can Be Supplied Per Inch
TC16	Rectangular	1" x 6"	Can Be Supplied Per Inch
TC1346	Rectangular	1 3/4" x 6"	Can Be Supplied Per Inch
TC2614	Rectangular	2" x 6 1/4"	Can Be Supplied Per Inch
TC2124	Rectangular	2 1/2" x 4"	Can Be Supplied Per Inch



Product Code	Size & Description	Channel Type
TCTC075	0.75mm Coreless Copper Tube	2 Channel
TCTC1	1mm Coreless Copper Tube	3 Channel
TCTC125	1.25mm Coreless Copper Tube	3 Channel
TCTC15	1.5mm Coreless Copper Tube	3 Channel
TCTC175	1.75mm Coreless Copper Tube	3 Channel
TCTC2	2mm Coreless Copper Tube	3 Channel
TCTC25	2.5mm Coreless Copper Tube	3 Channel
TCTC3	3mm Coreless Copper Tube	3 Channel
TCTC35	3.5mm Coreless Copper Tube	3 Channel
TCTC4	4mm Coreless Copper Tube	3 Channel
TCTC45	4.5mm Coreless Copper Tube	3 Channel
TCTC5	5mm Coreless Copper Tube	3 Channel
TCTC6	6mm Coreless Copper Tube	3 Channel
TCTC8	8mm Coreless Copper Tube	3 Channel

Metric Copper Tubes - Single Hole



Product Code	Size & Description	Channel Type
TCTM075	0.75mm Copper Tube	1 Channel
TCTM1	1mm Copper Tube	1 Channel
TCTM125	1.25mm Copper Tube	1 Channel
TCTM15	1.5mm Copper Tube	1 Channel
TCTM175	1.75mm Copper Tube	1 Channel
TCTM2	2mm Copper Tube	1 Channel
TCTM25	2.5mm Copper Tube	1 Channel
TCTM3	3mm Copper Tube	1 Channel
TCTM35	3.5mm Copper Tube	1 Channel
TCTM4	4mm Copper Tube	1 Channel
TCTM45	4.5mm Copper Tube	1 Channel
TCTM5	5mm Copper Tube	1 Channel
TCTM6	6mm Copper Tube	1 Channel
TCTM8	8mm Copper Tube	1 Channel



Main characteristics and properties of the materials :

- High as quenched hardness
- Low dimensional movement or distortion after hardening
- Hardens from a relatively low hardening temperature
- Good machinability

Typical Applications:

- Blanking Dies
- Gauges
- Form Tools
- Taps
- Punches
- Dies
- Gauge Blocks
- Jigs & Fixtures

Nominal chemical composition

- Carbon 0.95%
- Manganese 1.2%
- Chromium 0.50%
- Tungsten 0.50%
- Silicon 0.25%
- Vanadium 0.20%
- S & P up to 0.035% max.

O1 is a medium alloyed oil hardening steel with excellent cutting force and toughness.

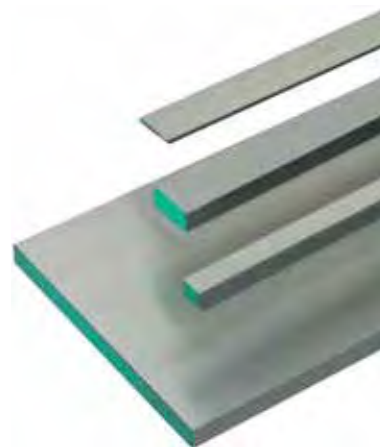
The excellent dimensional stability reduces distortion and the possibility of cracking during heat treatment.

Supplied in the annealed condition, the precision tolerances minimise additional costly tool room machining.

Ground Flat Stock provides toolmakers with a decarburisation free surface, plus high wear resistance after heat treatment, making it ideal for a multitude of uses and applications: dies, press tools, punches, gauges, cams, jigs, machining knives and marking devices.

Hardness as supplied: 229 Brinall max Tensile Strength: 45 Tons / sq. in.

Hales stock a comprehensive range of metric Ground Flat Stock in 500mm lengths. 1 metre lengths also available.

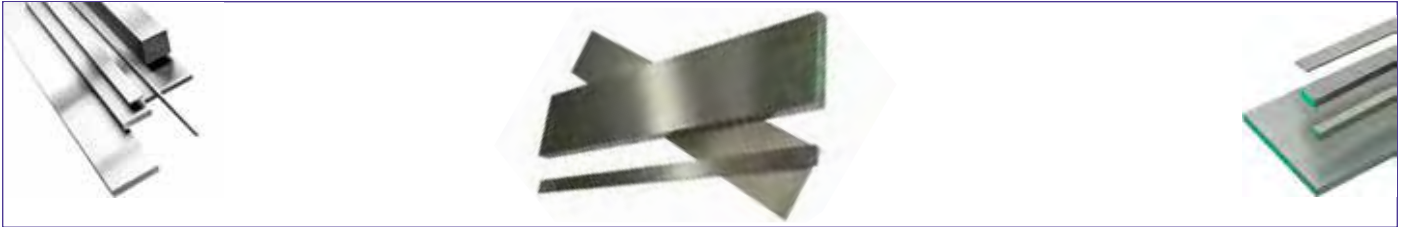


Gauge Plate

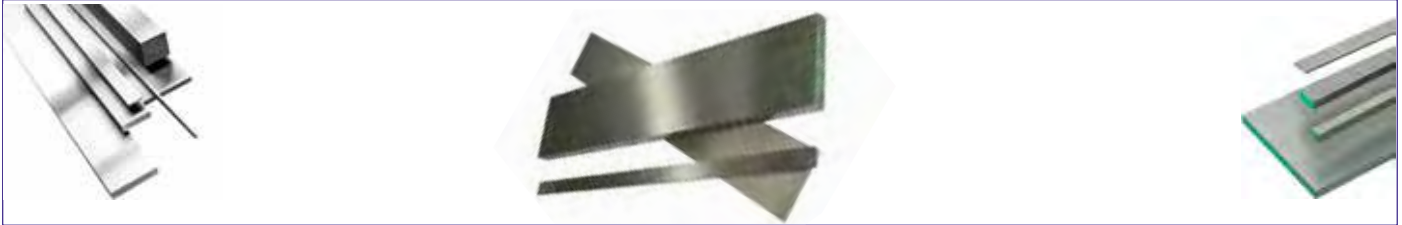


Part Number	Description	Part Number	Description	Part Number	Description
GM01010	1 X 10 X 500 Gauge Plate	GM01075	1 X 75 X 500 Gauge Plate	GM015015M	1.5 X 15 X 1000 Gauge Plate
GM01010M	1 X 10 X 1000 Gauge Plate	GM01075M	1 X 75 X 1000 Gauge Plate	GM015020	1.5 X 20 X 500 Gauge Plate
GM01015	1 X 15 X 500 Gauge Plate	GM01080	1 X 80 X 500 Gauge Plate	GM015025	1.5 X 25 X 500 Gauge Plate
GM01020	1 X 20 X 500 Gauge Plate	GM01100	1 X 100 X 500 Gauge Plate	GM015025M	1.5 X 25 X 1000 Gauge Plate
GM01020M	1 X 20 X 1000 Gauge Plate	GM01100M	1 X 100 X 1000 Gauge Plate	GM015030	1.5 X 30 X 500 Gauge Plate
GM01025	1 X 25 X 500 Gauge Plate	GM01125	1 X 125 X 500 Gauge Plate	GM015030M	1.5 X 30 X 1000 Gauge Plate
GM01030	1 X 30 X 500 Gauge Plate	GM01125M	1 X 125 X 1000 Gauge Plate	GM015040	1.5 X 40 X 500 Gauge Plate
GM01030M	1 X 30 X 1000 Gauge Plate	GM01150	1 X 150 X 500 Gauge Plate	GM015050	1.5 X 50 X 500 Gauge Plate
GM01040	1 X 40 X 500 Gauge Plate	GM01150M	1 X 150 X 1000 Gauge Plate	GM015050M	1.5 X 50 X 1000 Gauge Plate
GM01040M	1 X 40 X 1000 Gauge Plate	GM01200	1 X 200 X 500 Gauge Plate	GM015060	1.5 X 60 X 500 Gauge Plate
GM01050	1 X 50 X 500 Gauge Plate	GM01250	1 X 250 X 500 Gauge Plate	GM015060M	1.5 X 60 X 1000 Gauge Plate
GM01050M	1 X 50 X 1000 Gauge Plate	GM01300	1 X 300 X 500 Gauge Plate	GM015075	1.5 X 75 X 500 Gauge Plate
GM01060	1 X 60 X 500 Gauge Plate	GM015010	1.5 X 10 X 500 Gauge Plate	GM015075M	1.5 X 75 X 1000 Gauge Plate
GM01060M	1 X 60 X 1000 Gauge Plate	GM015015	1.5 X 15 X 500 Gauge Plate	GM015080	1.5 X 80 X 500 Gauge Plate

Gauge Plate



Part Number	Description	Part Number	Description	Part Number	Description
GM015080M	1.5 X 80 X 1000 Gauge Plate	GM05250M	5 X 250 X 1000 Gauge Plate	GM08015M	8 X 15 X 1000 Gauge Plate
GM015100	1.5 X 100 X 500 Gauge Plate	GM05300	5 X 300 X 500 Gauge Plate	GM08020	8 X 20 X 500 Gauge Plate
GM015100M	1.5 X 100 X 1000 Gauge Plate	GM0600	6mm Sq X 500 Gauge Plate	GM08020M	8 X 20 X 1000 Gauge Plate
GM015125	1.5 X 125 X 500 Gauge Plate	GM06010	6 X 10 X 500 Gauge Plate	GM08025	8 X 25 X 500 Gauge Plate
GM015125M	1.5 X 125 X 1000 Gauge Plate	GM06010M	6 X 10 X 1000 Gauge Plate	GM08025M	8 X 25 X 1000 Gauge Plate
GM015150	1.5 X 150 X 500 Gauge Plate	GM06015	6 X 15 X 500 Gauge Plate	GM08030	8 X 30 X 500 Gauge Plate
GM015150M	1.5 X 150 X 1000 Gauge Plate	GM05250	5 X 250 X 500 Gauge Plate	GM08030M	8 X 30 X 1000 Gauge Plate
GM015200	1.5 X 200 X 500 Gauge Plate	GM05250M	5 X 250 X 1000 Gauge Plate	GM08040	8 X 40 X 500 Gauge Plate
GM015200M	1.5 X 200 X 1000 Gauge Plate	GM05300	5 X 300 X 500 Gauge Plate	GM08040M	8 X 40 X 1000 Gauge Plate
GM015250	1.5 X 250 X 500 Gauge Plate	GM0600	6mm Sq X 500 Gauge Plate	GM08050	8 X 50 X 500 Gauge Plate
GM015300	1.5 X 300 X 500 Gauge Plate	GM06010	6 X 10 X 500 Gauge Plate	GM08050M	8 X 50 X 1000 Gauge Plate
GM02010	2 X 10 X 500 Gauge Plate	GM06010M	6 X 10 X 1000 Gauge Plate	GM08060	8 X 60 X 500 Gauge Plate
GM02010M	2 X 10 X 1000 Gauge Plate	GM06015	6 X 15 X 500 Gauge Plate	GM08060M	8 X 60 X 1000 Gauge Plate
GM02015	2 X 15 X 500 Gauge Plate	GM06015M	6 X 15 X 1000 Gauge Plate	GM08075	8 X 75 X 500 Gauge Plate
GM02015M	2 X 15 X 1000 Gauge Plate	GM06020	6 X 20 X 500 Gauge Plate	GM08075M	8 X 75 X 1000 Gauge Plate
GM02020	2 X 20 X 500 Gauge Plate	GM06020M	6 X 20 X 1000 Gauge Plate	GM08080	8 X 80 X 500 Gauge Plate
GM02020M	2 X 20 X 1000 Gauge Plate	GM06025	6 X 25 X 500 Gauge Plate	GM08080M	8 X 80 X 1000 Gauge Plate
GM02025	2 X 25 X 500 Gauge Plate	GM06025M	6 X 25 X 1000 Gauge Plate	GM08100	8 X 100 X 500 Gauge Plate
GM02025M	2 X 25 X 1000 Gauge Plate	GM06030	6 X 30 X 500 Gauge Plate	GM08100M	8 X 100 X 1000 Gauge Plate
GM02030	2 X 30 X 500 Gauge Plate	GM06030M	6 X 30 X 1000 Gauge Plate	GM08125	8 X 125 X 500 Gauge Plate
GM02030M	2 X 30 X 1000 Gauge Plate	GM06040	6 X 40 X 500 Gauge Plate	GM08125M	8 X 125 X 1000 Gauge Plate
GM02040	2 X 40 X 500 Gauge Plate	GM06040M	6 X 40 X 1000 Gauge Plate	GM08150	8 X 150 X 500 Gauge Plate
GM02040M	2 X 40 X 1000 Gauge Plate	GM06050	6 X 50 X 500 Gauge Plate	GM08150M	8 X 150 X 1000 Gauge Plate
GM02050	2 X 50 X 500 Gauge Plate	GM06050M	6 X 50 X 1000 Gauge Plate	GM08200	8 X 200 X 500 Gauge Plate
GM02050M	2 X 50 X 1000 Gauge Plate	GM06060	6 X 60 X 500 Gauge Plate	GM08200M	8 X 200 X 1000 Gauge Plate
GM02060	2 X 60 X 500 Gauge Plate	GM06060M	6 X 60 X 1000 Gauge Plate	GM08250	8 X 250 X 500 Gauge Plate
GM02060M	2 X 60 X 1000 Gauge Plate	GM06075	6 X 75 X 500 Gauge Plate	GM08250M	8 X 250 X 1000 Gauge Plate
GM02075	2 X 75 X 500 Gauge Plate	GM06075M	6 X 75 X 1000 Gauge Plate	GM08300	8 X 300 X 500 Gauge Plate
GM02075M	2 X 75 X 1000 Gauge Plate	GM06080	6 X 80 X 500 Gauge Plate	GM1000	10mmsq X 500 Gauge Plate
GM02080	2 X 80 X 500 Gauge Plate	GM06080M	6 X 80 X 1000 Gauge Plate	GM10015	10 X 15 X 500 Gauge Plate
GM02080M	2 X 80 X 1000 Gauge Plate	GM06100	6 X 100 X 500 Gauge Plate	GM10015M	10 X 15 X 1000 Gauge Plate
GM05075M	5 X 75 X 1000 Gauge Plate	GM06100M	6 X 100 X 1000 Gauge Plate	GM10020	10 X 20 X 500 Gauge Plate
GM05080	5 X 80 X 500 Gauge Plate	GM06125	6 X 125 X 500 Gauge Plate	GM10020M	10 X 20 X 1000 Gauge Plate
GM05080M	5 X 80 X 1000 Gauge Plate	GM06125M	6 X 125 X 1000 Gauge Plate	GM10025	10 X 25 X 500 Gauge Plate
GM05100	5 X 100 X 500 Gauge Plate	GM06150	6 X 150 X 500 Gauge Plate	GM10025M	10 X 25 X 1000 Gauge Plate
GM05100M	5 X 100 X 1000 Gauge Plate	GM06150M	6 X 150 X 1000 Gauge Plate	GM10030	10 X 30 X 500 Gauge Plate
GM05125	5 X 125 X 500 Gauge Plate	GM06200	6 X 200 X 500 Gauge Plate	GM10030M	10 X 30 X 1000 Gauge Plate
GM05125M	5 X 125 X 1000 Gauge Plate	GM06200M	6 X 200 X 1000 Gauge Plate	GM10040	10 X 40 X 500 Gauge Plate
GM05150	5 X 150 X 500 Gauge Plate	GM06250	6 X 250 X 500 Gauge Plate	GM10040M	10 X 40 X 1000 Gauge Plate
GM05150M	5 X 150 X 1000 Gauge Plate	GM06300	6 X 300 X 500 Gauge Plate	GM10050	10 X 50 X 500 Gauge Plate
GM05200	5 X 200 X 500 Gauge Plate	GM0800	8mmsq X 500 Gauge Plate	GM10050M	10 X 50 X 1000 Gauge Plate
GM05200M	5 X 200 X 1000 Gauge Plate	GM08010	8 X 10 X 500 Gauge Plate	GM10060	10 X 60 X 500 Gauge Plate
GM05250	5 X 250 X 500 Gauge Plate	GM08010M	8 X 10 X 1000 Gauge Plate	GM10060M	10 X 60 X 1000 Gauge Plate
GM05250	5 X 250 X 500 Gauge Plate	GM08015	8 X 15 X 500 Gauge Plate	GM10075	10 X 75 X 500 Gauge Plate
GM10075M	10 X 75 X 1000 Gauge Plate	GM15030M	15 X 30 X 1000 Gauge Plate	GM25040M	25 X 40 X 1000 Gauge Plate



Part Number	Description	Part Number	Description	Part Number	Description
GM10100	10 X 100 X 500 Gauge Plate	GM15040	15 X 40 X 500 Gauge Plate	GM25050	25 X 50 X 500 Gauge Plate
GM10100M	10 X 100 X 1000 Gauge Plate	GM15040M	15 X 40 X 1000 Gauge Plate	GM25050M	25 X 50 X 1000 Gauge Plate
GM10125	10 X 125 X 500 Gauge Plate	GM15050	15 X 50 X 500 Gauge Plate	GM25060	25 X 60 X 500 Gauge Plate
GM10125M	10 X 125 X 1000 Gauge Plate	GM15050M	15 X 50 X 1000 Gauge Plate	GM25075	25 X 75 X 500 Gauge Plate
GM10150	10 X 150 X 500 Gauge Plate	GM15060	15 X 60 X 500 Gauge Plate	GM25075M	25 X 75 X 1000 Gauge Plate
GM10150M	10 X 150 X 1000 Gauge Plate	GM15060M	15 X 60 X 1000 Gauge Plate	GM25080	25 X 80 X 500 Gauge Plate
GM10200	10 X 200 X 500 Gauge Plate	GM15075	15 X 75 X 500 Gauge Plate	GM25080M	25 X 80 X 1000 Gauge Plate
GM10200M	10 X 200 X 1000 Gauge Plate	GM15080	15 X 80 X 500 Gauge Plate	GM25100	25 X 100 X 500 Gauge Plate
GM10250	10 X 250 X 500 Gauge Plate	GM15100	15 X 100 X 500 Gauge Plate	GM25100M	25 X 100 X 1000 Gauge Plate
GM10300	10 X 300 X 500 Gauge Plate	GM15100M	15 X 100 X 1000 Gauge Plate	GM25125	25 X 125 X 500 Gauge Plate
GM1200	12mm Sq X 500 Gauge Plate	GM15125	15 X 125 X 500 Gauge Plate	GM25125M	25 X 125 X 1000 Gauge Plate
GM12015	12 X 15 X 500 Gauge Plate	GM15150	15 X 150 X 500 Gauge Plate	GM25150	25 X 150 X 500 Gauge Plate
GM12015M	12 X 15 X 1000 Gauge Plate	GM15150M	15 X 150 X 1000 Gauge Plate	GM25200	25 X 200 X 500 Gauge Plate
GM12020	12 X 20 X 500 Gauge Plate	GM15200	15 X 200 X 500 Gauge Plate	GM25250	25 X 250 X 500 Gauge Plate
GM12020M	12 X 20 X 1000 Gauge Plate	GM15250	15 X 250 X 500 Gauge Plate	GM25250M	25 X 250 X 1000 Gauge Plate
GM12025	12 X 25 X 500 Gauge Plate	GM15250M	15 X 250 X 1000 Gauge Plate	GM25300	25 X 300 X 500 Gauge Plate
GM12025M	12 X 25 X 1000 Gauge Plate	GM15300	15 X 300 X 500 Gauge Plate	GM25300M	25 X 300 X 1000 Gauge Plate
GM12030	12 X 30 X 500 Gauge Plate	GM2000	20mm sq X 500 Gauge Plate	GM3000	30mmsq X 500 Gauge Plate
GM12030M	12 X 30 X 1000 Gauge Plate	GM2000M	20mmsq X 1000 Gauge Plate	GM30040	30 X 40 X 500 Gauge Plate
GM12040	12 X 40 X 500 Gauge Plate	GM20025	20 X 25 X 500 Gauge Plate	GM30040M	30 X 40 X 1000 Gauge Plate
GM12040M	12 X 40 X 1000 Gauge Plate	GM20025M	20 X 25 X 1000 Gauge Plate	GM30050	30 X 50 X 500 Gauge Plate
GM12050	12 X 50 X 500 Gauge Plate	GM20030	20 X 30 X 500 Gauge Plate	GM30050M	30 X 50 X 1000 Gauge Plate
GM12050M	12 X 50 X 1000 Gauge Plate	GM20030M	20 X 30 X 1000 Gauge Plate	GM30060	30 X 60 X 500 Gauge Plate
GM12060	12 X 60 X 500 Gauge Plate	GM20040	20 X 40 X 500 Gauge Plate	GM30060M	30 X 60 X 1000 Gauge Plate
GM12060M	12 X 60 X 1000 Gauge Plate	GM20040M	20 X 40 X 1000 Gauge Plate	GM30075	30 X 75 X 500 Gauge Plate
GM12075	12 X 75 X 500 Gauge Plate	GM20050	20 X 50 X 500 Gauge Plate	GM30075M	30 X 75 X 1000 Gauge Plate
GM12080	12 X 80 X 500 Gauge Plate	GM20050M	20 X 50 X 1000 Gauge Plate	GM30080	30 X 80 X 500 Gauge Plate
GM12080M	12 X 80 X 1000 Gauge Plate	GM20060	20 X 60 X 500 Gauge Plate	GM30080M	30 X 80 X 1000 Gauge Plate
GM12100	12 X 100 X 500 Gauge Plate	GM20060M	20 X 60 X 1000 Gauge Plate	GM30100	30 X 100 X 500 Gauge Plate
GM12100M	12 X 100 X 1000 Gauge Plate	GM20075	20 X 75 X 500 Gauge Plate	GM30125	30 X 125 X 500 Gauge Plate
GM12125	12 X 125 X 500 Gauge Plate	GM20075M	20 X 75 X 1000 Gauge Plate	GM30125M	30 X 125 X 1000 Gauge Plate
GM12125M	12 X 125 X 1000 Gauge Plate	GM20080	20 X 80 X 500 Gauge Plate	GM30150	30 X 150 X 500 Gauge Plate
GM12150	12 X 150 X 500 Gauge Plate	GM20080M	20 X 80 X 1000 Gauge Plate	GM30150M	30 X 150 X 1000 Gauge Plate
GM12150M	12 X 150 X 1000 Gauge Plate	GM20100	20 X 100 X 500 Gauge Plate	GM30200	30 X 200 X 500 Gauge Plate
GM12200	12 X 200 X 500 Gauge Plate	GM20125	20 X 125 X 500 Gauge Plate	GM30200M	30 X 200 X 1000 Gauge Plate
GM12200M	12 X 200 X 1000 Gauge Plate	GM20150	20 X 150 X 500 Gauge Plate	GM30250	30 X 250 X 500 Gauge Plate
GM12250	12 X 250 X 500 Gauge Plate	GM20200	20 X 200 X 500 Gauge Plate	GM30250M	30 X 250 X 1000 Gauge Plate
GM12250M	12 X 250 X 1000 Gauge Plate	GM20250	20 X 250 X 500 Gauge Plate	GM30300	30 X 300 X 500 Gauge Plate
GM12300	12 X 300 X 500 Gauge Plate	GM20250M	20 X 250 X 1000 Gauge Plate	GM30300M	30 X 300 X 1000 Gauge Plate
GM1500	15mmsq X 500 Gauge Plate	GM20300	20 X 300 X 500 Gauge Plate	GM4000	40mmsq X 500 Gauge Plate
GM15020	15 X 20 X 500 Gauge Plate	GM2500	25mm Sq X 500 Gauge Plate	GM5000	50mmsq X 500 Gauge Plate
GM15020M	15 X 20 X 1000 Gauge Plate	GM25030	25 X 30 X 500 Gauge Plate		
GM15025	15 X 25 X 500 Gauge Plate	GM25030M	25 X 30 X 1000 Gauge Plate		
GM15030	15 X 30 X 500 Gauge Plate	GM25040	25 X 40 X 500 Gauge Plate		



METRIC Silver Steel Water Hardening

Product Code	Rod Diameter x Length
SSM02	2mm Dia. x 1m
SSM025	2.5mm Dia. x 1m
SSM03	3mm Dia. x 1m
SSM035	3.5mm Dia. x 1m
SSM04	4mm Dia. x 1m
SSM045	4.5mm Dia. x 1m
SSM05	5mm Dia. x 1m
SSM055	5.5mm Dia. x 1m
SSM06	6mm Dia. x 1m
SSM065	6.5mm Dia. x 1m
SSM075	7.5mm Dia. x 1m
SSM08	8mm Dia. x 1m
SSM09	9mm Dia. x 1m
SSM095	9.5mm Dia. x 1m
SSM10	10mm Dia. x 1m
SSM12	12mm Dia. x 1m
SSM125	12.5mm Dia. x 1m
SSM13	13mm Dia. x 1m
SSM14	14mm Dia. x 1m
SSM15	15mm Dia. x 1m
SSM16	16mm Dia. x 1m
SSM17	17mm Dia. x 1m
SSM18	18mm Dia. x 1m
SSM19	19mm Dia. x 1m
SSM20	20mm Dia. x 1m
SSM21	21mm Dia. x 1m
SSM22	22mm Dia. x 1m
SSM23	23mm Dia. x 1m
SSM24	24mm Dia. x 1m
SSM25	25mm Dia. x 1m
SSM26	26mm Dia. x 1m
SSM30	30mm Dia. x 1m

IMPERIAL Silver Steel Water Hardening

Product Code	Rod Diameter x Length
SS08	1/8 Dia. x 1m
SS12	3/16 Dia. x 1m
SS16	1/4 Dia. x 1m
SS20	5/16 Dia. x 1m
SS24	3/8 Dia. x 1m
SS28	7/16 Dia. x 1m
SS32	1/2 Dia. x 1m
SS40	5/8 Dia. x 1m
SS48	3/4 Dia. x 1m
SS56	7/8 Dia. x 1m
SS64	1" Dia. x 1m
SS86	1.1/4" Dia. x 1m



Product Code	Description (W x Thickness x L)	Product Code	Description (W x Thickness x L)	Product Code	Description (W x Thickness x L)
HSB506-050	50 X 6 stock bar 50cm	HSB10016-050	100 X 16 stock bar 50cm	HSB20030-100	200 X 30 stock bar 100cm
HSB506-100	50 X 6 stock bar 100cm	HSB10016-100	100 X 16 stock bar 100cm	HSB20040-050	200 X 40 stock bar 50cm
HSB5010-050	50 X 10 stock bar 50cm	HSB10020-050	100 X 20 stock bar 50cm	HSB20040-100	200 X 40 stock bar 100cm
HSB5010-100	50 X 10 stock bar 100cm	HSB10020-100	100 X 20 stock bar 100cm	HSB20050-050	200 X 50 stock bar 50cm
HSB5012-050	50 X 12 stock bar 50cm	HSB10025-050	100 X 25 stock bar 50cm	HSB20050-100	200 X 50 stock bar 100cm
HSB5012-100	50 X 12 stock bar 100cm	HSB10025-100	100 X 25 stock bar 100cm		
HSB5016-050	50 X 16 stock bar 50cm	HSB10032-050	100 X 32 stock bar 50cm	HSB25010-050	250 X 10 stock bar 50cm
HSB5016-100	50 X 16 stock bar 100cm	HSB10032-100	100 X 32 stock bar 100cm	HSB25010-100	250 X 10 stock bar 100cm
HSB5020-050	50 X 20 stock bar 50cm	HSB10040-050	100 X 40 stock bar 50cm	HSB25012-050	250 X 12 stock bar 50cm
HSB5020-100	50 X 20 stock bar 100cm	HSB10040-100	100 X 40 stock bar 100cm	HSB25012-100	250 X 12 stock bar 100cm
HSB5025-050	50 X 25 stock bar 50cm	HSB10050-050	100 X 50 stock bar 50cm	HSB25016-050	250 X 16 stock bar 50cm
HSB5025-100	50 X 25 stock bar 100cm	HSB10050-100	100 X 50 stock bar 100cm	HSB25016-100	250 X 16 stock bar 100cm
HSB5030-050	50 X 30 stock bar 50cm			HSB25020-050	250 X 20 stock bar 50cm
HSB5030-100	50 X 30 stock bar 100cm	HSB1506-050	150 X 6 stock bar 50cm	HSB25020-100	250 X 20 stock bar 100cm
HSB5040-050	50 X 40 stock bar 50cm	HSB15010-050	150 X 10 stock bar 50cm	HSB25025-050	250 X 25 stock bar 50cm
HSB5040-100	50 X 40 stock bar 100cm	HSB15010-100	150 X 10 stock bar 100cm	HSB25025-100	250 X 25 stock bar 100cm
HSB5050-050	50 X 50 stock bar 50cm	HSB15012-050	150 X 12 stock bar 50cm	HSB25030-050	250 X 30 stock bar 50cm
HSB5050-100	50 X 50 stock bar 100cm	HSB15012-100	150 X 12 stock bar 100cm	HSB25030-100	250 X 30 stock bar 100cm
		HSB15016-050	150 X 16 stock bar 50cm	HSB25040-050	250 X 40 stock bar 50cm
HSB7506-050	75 X 6 stock bar 50cm	HSB15016-100	150 X 16 stock bar 100cm	HSB25040-100	250 X 40 stock bar 100cm
HSB7512-050	75 X 12 stock bar 50cm	HSB15020-050	150 X 20 stock bar 50cm	HSB25050-050	250 X 50 stock bar 50cm
HSB7512-100	75 X 12 stock bar 100cm	HSB15020-100	150 X 20 stock bar 100cm	HSB25050-100	250 X 50 stock bar 100cm
HSB7516-050	75 X 16 stock bar 50cm	HSB15025-050	150 X 25 stock bar 50cm	HSB25060-050	250 X 60 stock bar 50cm
HSB7516-100	75 X 16 stock bar 100cm	HSB15025-100	150 X 25 stock bar 100cm	HSB25060-100	250 X 60 stock bar 100cm
HSB7520-050	75 X 20 stock bar 50cm	HSB15032-050	150 X 32 stock bar 50cm		
HSB7520-100	75 X 20 stock bar 100cm	HSB15032-100	150 X 32 stock bar 100cm	HSB30012-050	300 X 12 stock bar 50cm
HSB7525-050	75 X 25 stock bar 50cm	HSB15040-050	150 X 40 stock bar 50cm	HSB30012-100	300 X 12 stock bar 100cm
HSB7525-100	75 X 25 stock bar 100cm	HSB15040-100	150 X 40 stock bar 100cm	HSB30016-050	300 X 16 stock bar 50cm
HSB7530-050	75 X 30 stock bar 50cm	HSB15050-050	150 X 50 stock bar 50cm	HSB30016-100	300 X 16 stock bar 100cm
HSB7530-100	75 X 30 stock bar 100cm	HSB15050-100	150 X 50 stock bar 100cm	HSB30020-050	300 X 20 stock bar 50cm
HSB7540-050	75 X 40 stock bar 50cm			HSB30020-100	300 X 20 stock bar 100cm
HSB7540-100	75 X 40 stock bar 100cm	HSB20012-050	200 X 12 stock bar 50cm	HSB30025-050	300 X 25 stock bar 50cm
HSB7550-050	75 X 50 stock bar 50cm	HSB20012-100	200 X 12 stock bar 100cm	HSB30025-100	300 X 25 stock bar 100cm
HSB7550-100	75 X 50 stock bar 100cm	HSB20016-050	200 X 16 stock bar 50cm	HSB30030-050	300 X 30 stock bar 50cm
		HSB20016-100	200 X 16 stock bar 100cm	HSB30030-100	300 X 30 stock bar 100cm
HSB1006-050	100 X 6 stock bar 50cm	HSB20020-050	200 X 20 stock bar 50cm	HSB30040-050	300 X 40 stock bar 50cm
HSB1006-100	100 X 6 stock bar 100cm	HSB20020-100	200 X 20 stock bar 100cm	HSB30040-100	300 X 40 stock bar 100cm
HSB10010-050	100 X 10 stock bar 50cm	HSB20025-050	200 X 25 stock bar 50cm	HSB30050-050	300 X 50 stock bar 50cm
HSB10010-100	100 X 10 stock bar 100cm	HSB20025-100	200 X 25 stock bar 100cm	HSB30050-100	300 X 50 stock bar 100cm
HSB10012-050	100 X 12 stock bar 50cm	HSB20030-050	200 X 30 stock bar 50cm	HSB30060-050	300 X 60 stock bar 50cm
HSB10012-100	100 X 12 stock bar 100cm			HSB30060-100	300 X 60 stock bar 100cm



	Product Code	Diameter	Length
Urethane Shore A90	U006-L	6mm	1 Metre
	U010-L	10mm	1 Metre
	U012-L	12mm	1 Metre
	U015-L	15mm	1 Metre
	U022-L	22mm	1 Metre
	U025-L	25mm	1 Metre
	U032-L	32mm	1 Metre
	U035-L	35mm	1 Metre
	U040-L	40mm	1 Metre
	U045-L	45mm	1 Metre
	U050-L	50mm	1 Metre
	U060-L	60mm	1 Metre
	U070-L	70mm	1 Metre
	U100-L	100mm	1 Metre

Steel Shim in a Can

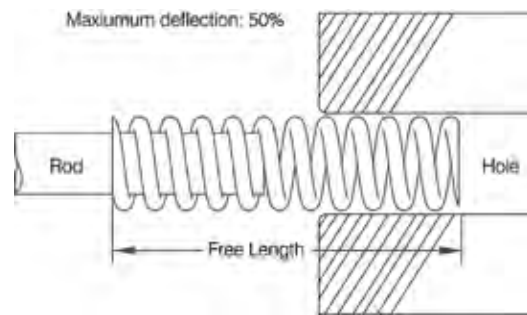


Product Code	Description
SHS001	0.001 SHIM STEEL 6 inch wide x 100 inch long
SHS002	0.002 SHIM STEEL 6 inch wide x 100 inch long
SHS003	0.003 SHIM STEEL 6 inch wide x 100 inch long
SHS004	0.004 SHIM STEEL 6 inch wide x 100 inch long
SHS005	0.005 SHIM STEEL 6 inch wide x 100 inch long
SHS006	0.006 SHIM STEEL 6 inch wide x 100 inch long
SHS008	0.008 SHIM STEEL 6 inch wide x 100 inch long
SHS010	0.010 SHIM STEEL 6 inch wide x 100 inch long
SHS012	0.012 SHIM STEEL 6 inch wide x 100 inch long
SHS015	0.015 SHIM STEEL 6 inch wide x 100 inch long
SHS020	0.020 SHIM STEEL 6 inch wide x 100 inch long
SHSA	ASSORTED SHIM 12 PACK incl. 6" X 12" X 12PCs of 0.001, 0.0015, 0.002, 0.003, 0.004, 0.005, 0.006, 0.007, 0.008, 0.010, 0.012, 0.015



Silicone Chrome Die Springs
Raymond

Medium Duty
Colour - BLUE

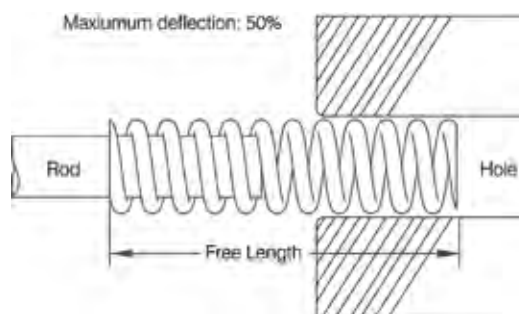


Hole Dia.	Rod Dia.	Product Code	Free Length		lb at 1/10" Defl	Maximum Deflection 50% of Free Length		Deflection for Average life 40% of Free Length		Deflection for Long life 25% of Free Length		Total Travel to Solid	
			mm	in		Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.
3/8" 10mm	3/16" 4.5mm	DRM0308	25	1	5.6	28	0.500	23	0.400	14	0.250	31	0.545
		DRM0310	32	1.25	4.8	30	0.625	24	0.500	15	0.312	35	0.735
		DRM0312	38	1.5	3.8	29	0.750	23	0.600	14	0.375	34	0.906
		DRM0314	44	1.75	3.4	30	0.875	24	0.700	15	0.437	36	1.053
		DRM0316	51	2	2.8	28	1.000	22	0.800	14	0.500	35	1.248
		DRM0320	64	2.5	2.4	30	1.250	24	1.000	15	0.625	38	1.581
		DRM0324	76	3	1.8	27	1.500	22	1.200	14	0.750	35	1.931
		DRM0396	305	12	0.6	36	6.000	29	4.800	18	3.000	48	7.961
1/2" 13mm	9/32" 7mm	DRM0408	25	1	10	50	0.500	40	0.400	25	0.250	58	0.578
		DRM0410	32	1.25	9.2	58	0.625	46	0.500	29	0.312	66	0.722
		DRM0412	38	1.5	7.6	57	0.750	46	0.600	29	0.375	68	0.893
		DRM0414	44	1.75	6.8	60	0.875	48	0.700	30	0.437	71	1.048
		DRM0416	51	2	6.4	64	1.000	51	0.800	32	0.500	79	1.234
		DRM0420	64	2.5	5.2	65	1.250	52	1.000	33	0.625	81	1.550
		DRM0424	76	3	4	60	1.500	48	1.200	30	0.750	76	1.891
		DRM0428	89	3.5	3	53	1.750	42	1.400	26	0.875	67	2.233
		DRM0436	115	4.5	2.5	53	2.125	45	1.800	28	1.125	71	2.850
		DRM0496	305	12	0.8	48	6.000	38	4.800	24	3.000	56	6.931
5/8" 16mm	11/32" 8.5mm	DRM0508	25	1	13		0.500	52	0.400	33	0.250	55	0.420
		DRM0510	32	1.25	12.8		0.625	64	0.500	40	0.312	79	0.617
		DRM0512	38	1.5	10.8	81	0.750	65	0.600	41	0.375	88	0.815
		DRM0514	44	1.75	9.6	84	0.875	67	0.700	42	0.437	93	0.969
		DRM0516	51	2	8.8	88	1.000	70	0.800	44	0.500	102	1.157
		DRM0520	64	2.5	6	75	1.250	60	1.000	38	0.625	87	1.445
		DRM0524	76	3	5.6	84	1.500	67	1.200	42	0.750	103	1.840
		DRM0528	89	3.5	4.8	84	1.750	67	1.400	42	0.875	104	2.159
		DRM0532	102	4	4.4	88	2.000	70	1.600	44	1.000	113	2.576
		DRM0596	305	12	1.4	84	6.000	67	1.800	42	3.000	109	7.782
3/4" 19mm	3/8" 9.5mm	DRM0608	25	1	31.2	156	0.500	125	0.400	78	0.250	170	0.544
		DRM0610	32	1.25	25.6	160	0.625	128	0.500	80	0.312	179	0.699
		DRM0612	38	1.5	20	150	0.750	120	0.600	75	0.375	171	0.854
		DRM0614	44	1.75	17.6	154	0.875	123	0.700	77	0.437	176	1.000
		DRM0616	51	2	14.4	144	1.000	115	0.800	72	0.500	167	1.162
		DRM0620	64	2.5	12	150	1.250	120	1.000	75	0.625	177	1.474
		DRM0624	76	3	9.6	144	1.500	115	1.200	72	0.750	171	1.784
		DRM0628	89	3.5	8	140	1.750	112	1.400	70	0.875	168	2.094
		DRM0632	102	4	7.2	144	2.000	115	1.600	72	1.000	173	2.404
		DRM0636	115	4.5	6.4	144	2.250	115	1.800	72	1.125	174	2.714
		DRM0640	127	5	5.6	140	2.500	112	2.000	70	1.250	169	3.024
		DRM0644	139	5.5	4.8	132	2.750	106	2.200	66	1.375	160	3.334
		DRM0648	152	6	4	120	3.000	96	2.400	60	1.500	146	3.644
		DRM0696	305	12	2.4	144	6.000	115	4.800	72	3.000	177	7.364



Silicone Chrome Die Springs
Raymond

Medium Duty
Colour - BLUE

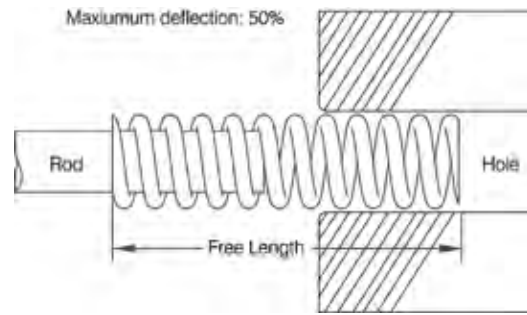


Hole Dia.	Rod Dia.	Product Code	Free Length		lb at 1/10" Defl	Maximum Deflection 50% of Free Length		Deflection for Average life 40% of Free Length		Deflection for Long life 25% of Free Length		Total Travel to Solid	
			mm	in		Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.
1" 25mm	1/2" 12.5mm	DRM0808	25	1.00	53.6		0.500	214	0.400	134	0.250	264	0.493
		DRM0810	32	1.25	43.6		0.625	218	0.500	136	0.312	272	0.624
		DRM0812	38	1.50	33.6	252	0.750	202	0.600	126	0.375	274	0.816
		DRM0814	44	1.75	28.8	248	0.875	202	0.700	126	0.437	272	0.944
		DRM0816	51	2.00	23.2	232	1.000	186	0.800	116	0.500	258	1.114
		DRM0820	64	2.50	20.0	250	1.250	200	1.000	125	0.625	282	1.411
		DRM0824	76	3.00	15.2	228	1.500	182	1.200	114	0.750	260	1.708
		DRM0828	89	3.50	12.8	224	1.750	80	1.400	112	0.875	266	2.082
		DRM0832	102	4.00	12.0	240	2.000	192	1.600	120	1.000	276	2.303
		DRM0836	115	4.50	10.4	234	2.250	187	1.800	117	1.125	271	2.601
		DRM0840	127	5.00	9.6	240	2.500	192	2.000	120	1.250	278	2.898
		DRM0844	139	5.50	8.8	242	2.750	194	2.200	121	1.375	281	3.195
		DRM0848	152	6.00	8.0	240	3.000	192	2.400	120	1.500	279	3.493
		DRM0856	178	7.00	7.2	252	3.500	202	2.800	126	1.750	294	4.086
		DRM0864	203	8.00	5.6	224	4.000	180	3.200	112	2.000	262	4.682
		DRM0896	305	12.00	4.0	240	6.000	192	4.800	120	3.000	282	7.062
1 1/4" 32mm	5/8" 15.5mm	DRM1012	38	1.50	49.6	372	0.750	298	0.600	186	0.375	399	0.804
		DRM1014	44	1.75	42.4	371	0.875	296	0.700	185	0.437	402	0.947
		DRM1016	51	2.00	35.2	352	1.000	282	0.800	176	0.500	398	1.130
		DRM1020	64	2.50	28.8	360	1.250	288	1.000	180	0.625	419	1.456
		DRM1024	76	3.00	24.0	360	1.500	288	1.200	180	0.750	428	1.782
		DRM1028	89	3.50	20.0	350	1.750	280	1.400	175	0.875	422	2.108
		DRM1032	102	4.00	17.6	352	2.000	282	1.600	176	1.000	428	2.434
		DRM1036	115	4.50	16.0	360	2.500	288	1.800	180	1.125	442	2.760
		DRM1040	127	5.00	13.6	340	2.500	272	2.000	170	1.250	420	3.086
		DRM1044	139	5.50	12.8	352	2.750	282	2.200	176	1.375	437	3.412
		DRM1048	152	6.00	12.0	360	3.000	288	2.400	180	1.500	449	3.738
		DRM1056	178	7.00	10.4	364	3.500	291	2.800	182	1.750	457	4.390
		DRM1064	203	8.00	8.8	352	4.000	282	3.200	176	2.000	444	5.042
		DRM1080	254	10.00	7.2	360	5.000	288	4.000	180	2.500	457	6.346
		DRM1096	305	12.00	5.6	336	6.000	269	4.800	168	3.000	428	7.650

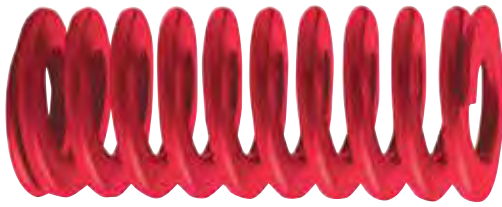
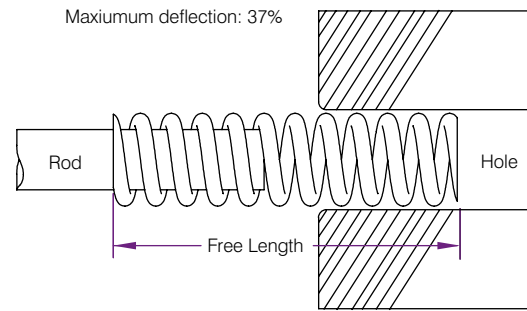


Silicone Chrome Die Springs
Raymond

Medium Duty
Colour - BLUE



Hole Dia.	Rod Dia.	Product Code	Free Length		lb at 1/10" Defl	Maximum Deflection 50% of Free Length		Deflection for Average life 40% of Free Length		Deflection for Long life 25% of Free Length		Total Travel to Solid	
			mm	in		Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.
1 1/2" 38mm	3/4" 19mm	DRM1216	51	2.00	44.8	448	1.00	358	0.800	224	0.500	500	1.116
		DRM1220	64	2.50	36.8	460	1.25	368	1.000	230	0.625	532	1.446
		DRM1224	76	3.00	33.6	504	1.50	403	1.200	252	0.750	597	1.776
		DRM1228	89	3.50	26.4	462	1.75	370	1.400	231	0.875	547	2.072
		DRM1232	102	4.00	21.6	432	2.00	346	1.600	216	1.000	526	2.436
		DRM1236	115	4.50	20.8	468	2.25	374	1.800	234	1.125	575	2.766
		DRM1240	127	5.00	20	500	2.50	400	2.000	250	1.250	619	3.096
		DRM1244	139	5.50	16.8	462	2.75	370	2.200	231	1.375	576	3.426
		DRM1248	152	6.00	14.4	432	3.00	346	2.400	216	1.500	540	3.756
		DRM1256	178	7.00	13.6	476	3.50	381	2.800	238	1.750	601	4.416
		DRM1264	203	8.00	12.8	512	4.00	410	3.200	256	2.000	650	5.076
		DRM1280	254	10.00	8.8	440	5.00	352	4.000	220	2.500	563	6.396
		DRM1296	305	12.00	8	480	6.00	384	4.800	240	3.000	606	7.580
2" 51mm	1" 25mm	DRM1620	64	2.50	89.6	1120	1.25	896	1.000	560	0.625	1179	1.316
		DRM1624	76	3.00	76.8	1152	1.50	922	1.200	576	0.750	1243	1.619
		DRM1628	89	3.50	64.8	1134	1.75	907	1.400	567	0.875	1245	1.922
		DRM1632	102	4.00	55.2	1104	2.00	883	1.600	552	1.000	1228	2.224
		DRM1636	115	4.50	47.2	1062	2.25	850	1.800	531	1.125	1193	2.527
		DRM1640	127	5.00	41.6	1040	2.50	832	2.000	520	1.250	1177	2.830
		DRM1644	139	5.50	39.2	1078	2.75	862	2.200	539	1.375	1228	3.132
		DRM1648	152	6.00	35.2	1056	3.00	845	2.400	528	1.500	1209	3.435
		DRM1656	178	7.00	31.2	1092	3.50	874	2.800	546	1.750	1260	4.040
		DRM1664	203	8.00	25.6	1024	4.00	819	3.200	512	2.000	1189	4.645
		DRM1680	254	10.00	20.8	1040	5.00	832	4.000	520	2.500	1218	5.857
		DRM1696	305	12.00	16.8	1008	6.00	806	4.800	504	3.000	1187	7.067

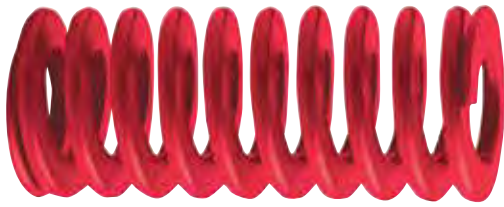
Silicone Chrome Die Springs
RaymondMedium/Heavy Duty
Colour - RED

Hole Dia.	Rod Dia.	Product Code	Free Length		lb at 1/10" Defl	Maximum Deflection 37% of Free Length		Deflection for Average life 25% of Free Length		Deflection for Long life 20% of Free Length		Total Travel to Solid	
			mm	in		Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.
3/8" 10mm	3/16" 4.5mm	DRMH0308	25	1.00	9.0	33	0.370	23	0.250	17	0.200	41	0.456
		DRMH0310	32	1.25	74.3	34	0.462	23	0.312	18	0.250	45	0.611
		DRMH0312	38	1.50	6.7	37	0.555	25	0.375	20	0.300	54	0.802
		DRMH0314	44	1.75	5.8	35	0.647	25	0.437	20	0.250	52	0.922
		DRMH0316	51	2.00	5.0	37	0.740	25	0.500	20	0.400	53	1.054
		DRMH0320	64	2.50	4.2	39	0.925	26	0.625	21	0.500	56	1.341
		DRMH0324	76	3.00	3.0	33	1.110	23	0.750	18	0.600	48	1.605
		DRMH0396	305	12.00	0.9	40	4.440	27	3.000	22	2.400	62	7.081

1/2" 13mm	9/32" 7mm	DRMH0408	25	1.00	16.8	62	0.370	42	0.250	34	0.200	84	0.499
		DRMH0410	32	1.25	13.9	64	0.462	43	0.312	35	0.250	90	0.647
		DRMH0412	38	1.50	12.0	67	0.555	45	0.375	36	0.300	97	0.811
		DRMH0414	44	1.75	10.4	67	0.647	45	0.437	36	0.350	100	0.962
Wire 0.61 x 0.093	DRMH0416	51	2.00	8.7	64	0.740	44	0.500	35	0.400	96	1.108	
	DRMH0420	64	2.50	6.8	63	0.925	43	0.625	34	0.500	95	1.404	
	DRMH0424	76	3.00	2.7	63	1.110	43	0.750	34	0.600	98	1.717	
	DRMH0428	89	3.50	4.7	61	1.295	41	0.875	33	0.700	94	1.998	
	DRMH0496	3.5	12.00	1.2	53	4.440	36	3.000	29	2.400	79	6.616	

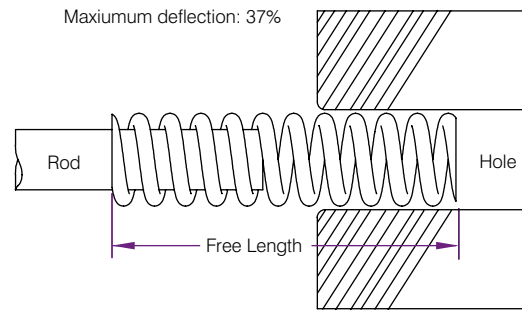
5/8" 16mm	11/32" 8.5mm	DRMH0508	25	1.00	27.7	102	0.370	69	0.250	55	0.200	106	0.383
		DRMH0510	32	1.25	20.8	96	0.462	65	0.312	52	0.250	104	0.498
		DRMH0512	38	1.50	19.0	105	0.555	71	0.375	57	0.300	126	0.664
		DRMH0514	44	1.75	16.8	109	0.647	73	0.437	59	0.350	141	0.837
		DRMH0516	51	2.00	14.8	110	0.740	74	0.500	59	0.400	148	0.997
		DRMH0520	64	2.50	11.5	106	0.925	72	0.625	58	0.500	143	1.246
		DRMH0524	76	3.00	10.0	111	1.110	75	0.750	60	0.600	156	1.558
		DRMH0528	89	3.50	8.5	110	1.295	74	0.875	60	0.700	155	1.828
		DRMH0532	102	4.00	7.6	112	1.482	76	1.000	61	0.800	166	2.182
		DRMH0596	305	12.00	2.7	120	4.440	81	3.000	65	2.400	184	6.817

3/4" 19mm	3/8" 9.5mm	DRMH0608	25	1.00	57.6	213	0.370	144	0.250	115	0.200	259	0.450
		DRMH0610	32	1.25	44.8	207	0.462	140	0.361	112	0.250	265	0.592
		DRMH0612	38	1.50	32.0	178	0.555	120	0.375	96	0.300	235	0.735
		DRMH0614	44	1.75	28.8	186	0.647	126	0.437	101	0.350	252	0.874
		DRMH0616	51	2.00	24.8	184	0.740	124	0.500	99	0.400	253	1.020
		DRMH0620	64	2.50	19.2	178	0.925	120	0.625	96	0.500	251	1.305
		DRMH0624	76	3.00	14.4	160	1.110	108	0.750	86	0.600	229	1.590
		DRMH0628	89	3.50	12.8	166	1.295	112	0.875	90	0.700	240	1.875
		DRMH0632	102	4.00	12.0	178	1.480	120	1.000	96	0.800	259	2.160
		DRMH0636	115	4.50	11.2	186	1.665	136	1.125	101	0.900	274	2.445
		DRMH0640	127	5.00	10.4	192	1.850	130	1.250	104	1.000	286	2.753
		DRMH0644	139	5.50	9.6	195	2.035	132	1.375	106	1.100	289	3.014
		DRMH0648	152	6.00	8.0	178	2.220	120	1.500	96	1.200	264	3.300
		DRMH0696	305	12.00	3.6	160	4.440	108	3.000	86	2.400	232	6.455



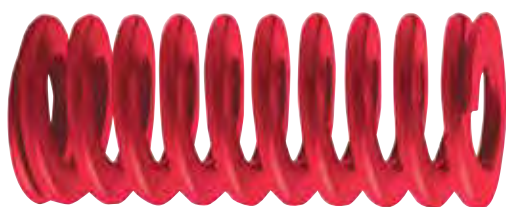
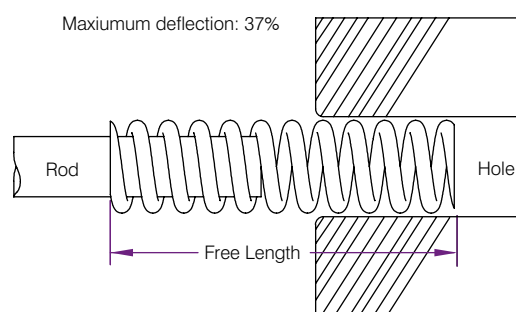
Silicone Chrome Die Springs
Raymond

Medium/Heavy Duty
Colour - RED



Hole Dia.	Rod Dia.	Product Code	Free Length		lb at 1/10" Defl	Maximum Deflection 37% of Free Length		Deflection for Average life 25% of Free Length		Deflection for Long life 20% of Free Length		Total Travel to Solid	
			mm	in		Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.
1" 25mm	1/2" 12.5mm	DRMH0808	25	1.00	72.0	266	0.370	180	0.250	144	0.200	297	0.412
		DRMH0810	32	1.25	62.4	288	0.462	195	0.312	156	0.250	300	0.481
		DRMH0812	38	1.50	49.6	275	0.555	186	0.375	149	0.300	350	0.706
		DRMH0814	44	1.75	44.0	285	0.647	192	0.437	154	0.350	364	0.828
		DRMH0816	51	2.00	36.8	272	0.740	184	0.500	147	0.400	368	1.000
		DRMH0820	64	2.50	28.8	266	0.925	180	0.625	144	0.500	373	1.295
		DRMH0824	76	3.00	23.2	258	1.110	174	0.750	139	0.600	369	1.589
Wire 0.115 x 0.218		DRMH0828	89	3.50	21.6	280	1.295	189	0.875	151	0.700	407	1.883
		DRMH0832	102	4.00	18.4	272	1.480	184	1.000	147	0.800	401	2.179
		DRMH0836	115	4.50	15.2	253	1.665	171	1.125	137	0.900	376	2.471
		DRMH0840	127	5.00	14.4	266	1.850	180	1.250	144	1.000	398	2.766
		DRMH0844	139	5.50	12.8	260	2.035	176	1.375	141	1.100	377	2.942
		DRMH0848	152	6.00	11.2	249	2.220	168	1.500	134	1.200	362	3.236
		DRMH0856	178	7.00	9.6	249	2.590	168	1.750	134	1.400	367	3.825
		DRMH0864	203	8.00	8.8	260	2.960	176	2.000	141	1.600	388	4.413
		DRMH0896	305	12.00	5.6	249	4.440	168	3.000	134	2.400	379	6.767
1 1/4" 32mm	5/8 15.5mm	DRMH1012	38	1.50	114.4	635	0.555	429	0.375	343	0.300	752	0.657
		DRMH1014	44	1.75	100.8	652	0.647	440	0.437	353	0.350	790	0.784
		DRMH1016	51	2.00	86.4	639	0.740	432	0.500	346	0.400	792	0.917
		DRMH1020	64	2.50	62.4	577	0.925	390	0.625	312	0.500	734	1.176
		DRMH1024	76	3.00	51.2	568	1.110	384	0.750	307	0.600	735	1.435
		DRMH1028	89	3.50	44.0	570	1.295	385	0.875	308	0.700	745	1.694
		DRMH1032	102	4.00	36.8	545	1.480	368	1.000	294	0.800	719	1.954
		DRMH1036	115	4.50	32.0	533	1.665	360	1.125	288	0.900	708	2.213
		DRMH1040	127	5.00	27.2	503	1.850	340	1.250	272	1.000	672	2.472
		DRMH1044	139	5.50	26.4	537	2.035	363	1.375	290	1.100	720	2.731
Wire 0.156 x 0.281		DRMH1048	152	6.00	23.2	515	2.220	348	1.500	278	1.200	712	3.071
		DRMH1056	178	7.00	20.0	518	2.590	350	1.750	280	1.400	702	3.509
		DRMH1064	203	8.00	18.4	545	2.960	368	2.000	294	1.600	741	4.028
		DRMH1080	254	10.00	12.8	474	3.700	320	2.500	256	2.000	648	5.065
		DRMH1096	305	12.00	11.2	497	4.440	336	3.000	269	2.400	683	6.102

Die Springs Medium Heavy Duty

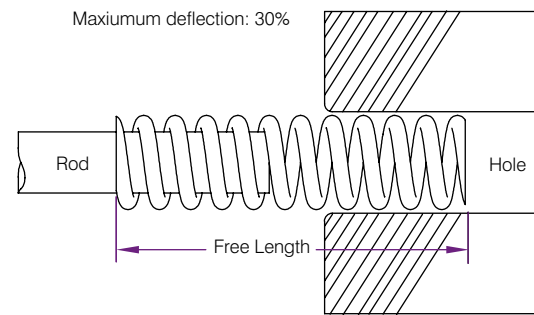
Silicone Chrome Die Springs
RaymondMedium/Heavy Duty
Colour - RED

Hole Dia.	Rod Dia.	Product Code	Free Length		lb at 1/10" Defl	Maximum Deflection 37% of Free Length		Deflection for Average life 25% of Free Length		Deflection for Long life 20% of Free Length		Total Travel to Solid	
			mm	in		Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.
1 1/2" 38mm	3/4" 19mm	DRMH1216	51	2.00	108.0	799	0.740	540	0.500	432	0.400	966	0.894
		DRMH1220	64	2.50	85.6	792	0.925	535	0.625	428	0.500	988	1.154
		DRMH1224	76	3.00	62.4	693	1.100	468	0.750	374	0.600	882	1.414
		DRMH1228	89	3.50	52.8	684	1.295	462	0.875	370	0.700	883	1.673
		DRMH1232	102	4.00	48.0	710	1.480	480	1.000	384	0.800	928	1.933
		DRMH1236	115	4.50	43.2	719	1.665	486	1.125	389	0.900	947	2.192
		DRMH1240	127	5.00	36.8	681	1.850	460	1.250	368	1.000	902	2.452
		DRMH1244	139	5.50	34.4	700	2.035	473	1.375	378	1.100	933	2.712
		DRMH1248	152	6.00	30.4	675	2.220	456	1.500	365	1.200	903	2.971
		DRMH1256	178	7.00	26.4	684	2.590	462	1.750	370	1.400	934	3.359
		DRMH1264	203	8.00	20.8	616	2.960	416	2.000	333	1.600	844	4.058
		DRMH1280	254	10.00	17.6	651	3.700	440	2.500	352	2.000	907	5.154
		DRMH1296	305	12.00	14.4	639	4.440	432	3.000	346	2.400	883	6.135
2" 51mm	1" 25mm	DRMH1620	64	2.50	118.4	1095	0.925	740	0.625	592	0.500	1326	1.120
		DRMH1624	76	3.00	96.0	1066	1.110	720	0.750	576	0.600	1334	1.390
		DRMH1628	89	3.50	80.0	1036	1.295	700	0.875	560	0.700	1328	1.660
		DRMH1632	102	4.00	66.4	983	1.480	664	1.000	531	0.800	1282	1.930
		DRMH1636	115	4.50	60.0	999	1.665	675	1.125	540	0.900	1320	2.200
		DRMH1640	127	5.00	56.0	1036	1.850	700	1.250	560	1.000	1383	2.470
		DRMH1644	139	5.50	50.4	1026	2.035	693	1.375	554	1.100	1381	2.740
		DRMH1648	152	6.00	47.2	1048	2.220	708	1.500	566	1.220	1421	3.010
		DRMH1656	178	7.00	40.0	1036	2.590	700	1.750	560	1.400	1420	3.550
		DRMH1664	203	8.00	35.2	1042	2.960	704	2.000	563	1.600	1440	4.090
		DRMH1680	254	10.00	24.0	888	3.700	600	2.500	480	2.000	1241	5.170
		DRMH1696	305	12.00	22.4	995	4.440	672	3.000	538	2.400	1400	6.250



Silicone Chrome Die Springs
Raymond

Heavy Duty
Colour - GOLD

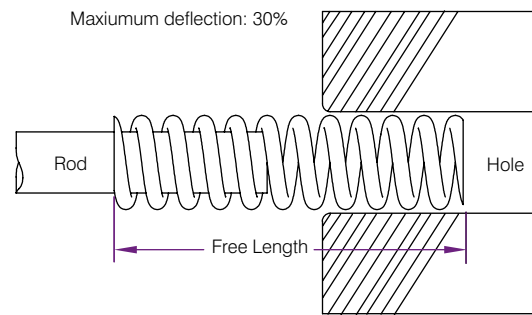


Hole Dia.	Rod Dia.	Product Code	Free Length		lb at 1/10" Defl	Maximum Deflection 30% of Free Length		Deflection for Average life 20% of Free Length		Deflection for Long life 15% of Free Length		Total Travel to Solid	
			mm	in		Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.
3/8" 10mm	3/16" 4.5mm	DRH0308	25	1.00	12.4	37	0.300	25	0.200	18	0.150	44	0.354
		DRH0310	32	1.25	9.8	37	0.375	25	0.250	18	0.187	45	0.463
		DRH0312	38	1.50	9.6	43	0.450	29	0.300	22	0.225	55	0.573
		DRH0314	44	1.75	8.4	44	0.525	29	0.350	22	0.262	58	0.686
		DRH0316	51	2.00	7.2	43	0.600	29	0.400	22	0.300	57	0.792
		DRH0320	64	2.50	6.0	45	0.750	30	0.500	23	0.375	66	1.011
		DRH0324	76	3.00	4.2	38	0.900	25	0.600	19	0.450	51	1.216
		DRH0396	305	12.00	1.2	43	3.600	29	2.400	22	1.800	70	5.818
1/2" 13mm	9/32" 7mm	DRH0408	25	1.00	23.6	71	0.300	47	0.200	35	0.150	107	0.455
		DRH0410	32	1.25	18.6	70	0.375	47	0.250	35	0.187	109	0.587
		DRH0412	38	1.50	16.4	74	0.450	49	0.300	37	0.225	121	0.737
		DRH0414	44	1.75	13.8	72	0.525	48	0.350	36	0.262	116	0.844
		DRH0416	51	2.00	11.0	66	0.600	44	0.400	33	0.300	110	1.000
		DRH0420	64	2.50	8.4	63	0.750	42	0.500	32	0.375	106	1.264
		DRH0424	76	3.00	7.4	67	0.900	44	0.600	33	0.450	113	1.528
		DRH0428	89	3.50	6.4	67	1.050	45	0.700	34	0.525	116	1.810
5/8" 16mm	11/32" 8.5mm	DRH0508	25	1.00	42.4	127	0.300	85	0.200	64	0.150	151	0.357
		DRH0510	32	1.25	29.6	111	0.375	74	0.250	55	0.187	140	0.474
		DRH0512	38	1.50	27.2	122	0.450	82	0.300	61	0.225	165	0.606
		DRH0514	44	1.75	24.0	126	0.525	84	0.350	63	0.262	175	0.730
		DRH0516	51	2.00	20.8	125	0.600	83	0.400	62	0.300	179	0.860
		DRH0520	64	2.50	17.0	128	0.750	85	0.500	64	0.375	190	1.118
		DRH0524	76	3.00	14.4	130	0.900	86	0.600	65	0.450	198	1.375
		DRH0528	89	3.50	12.2	128	1.050	85	0.700	64	0.525	199	1.633
		DRH0532	102	4.00	10.8	130	1.200	86	0.800	65	0.600	204	1.890
		DRH0596	305	12.00	4.0	144	3.600	96	2.400	72	1.800	201	5.016
		DRH0608	25	1.00	108.0	324	0.300	216	0.200	162	0.150	324	0.300
		DRH0610	32	1.25	86.8	326	0.375	217	0.250	162	0.187	353	0.407
3/4" 19mm	3/8" 9.5mm	DRH0612	38	1.50	65.6	295	0.450	197	0.300	148	0.225	337	0.514
		DRH0614	44	1.75	60.0	315	0.525	210	0.350	157	0.262	361	0.601
		DRH0616	51	2.00	49.6	298	0.600	198	0.400	149	0.300	361	0.728
		DRH0620	64	2.50	37.6	282	0.750	188	0.500	141	0.375	354	0.924
		DRH0624	76	3.00	31.2	281	0.900	187	0.600	140	0.450	361	1.156
		DRH0628	89	3.50	26.4	277	1.050	185	0.700	139	0.525	361	1.369
		DRH0632	102	4.00	23.2	278	1.200	186	0.800	139	0.600	367	1.583
		DRH0636	115	4.50	20.0	270	1.350	180	0.900	135	0.675	359	1.797
		DRH0640	127	5.00	17.6	264	1.500	176	1.000	132	0.750	354	2.011
		DRH0646	139	5.50	16.0	264	1.650	176	1.100	132	0.825	356	2.225
		DRH0648	152	6.00	14.4	259	1.800	173	1.200	130	0.900	351	2.438
		DRH0696	305	12.00	7.2	259	3.600	173	2.400	130	1.800	382	5.300



Silicone Chrome Die Springs
Raymond

Heavy Duty
Colour - GOLD

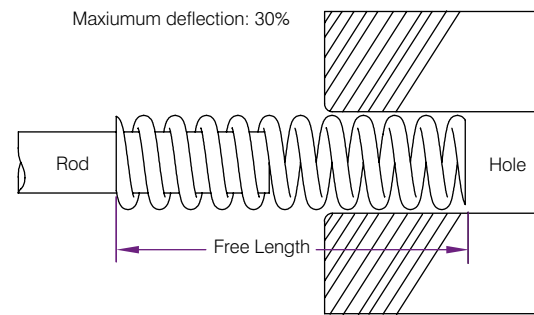


Hole Dia.	Rod Dia.	Product Code	Free Length		lb at 1/10" Defl	Maximum Deflection 30% of Free Length		Deflection for Average life 20% of Free Length		Deflection for Long life 15% of Free Length		Total Travel to Solid	
			mm	in		Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.
1" 25mm	1/2" 12.5mm	DRH0808	25	1.00	208.0		0.270	416	0.200	312	0.150	614	0.295
		DRH0810	32	1.25	171.2		0.380	428	0.250	320	0.187	540	0.315
		DRH0812	38	1.50	118.4	533	0.450	355	0.300	266	0.225	598	0.505
		DRH0814	44	1.75	104.0	546	0.525	364	0.350	272	0.262	655	0.630
		DRH0816	51	2.00	84.0	504	0.600	336	0.400	252	0.300	600	0.714
		DRH0820	64	2.50	68.0	510	0.750	340	0.500	255	0.375	628	0.924
		DRH0824	76	3.00	54.4	490	0.900	326	0.600	245	0.450	617	1.134
		DRH0828	89	3.50	45.6	479	1.050	319	0.700	239	0.525	612	1.343
		DRH0832	102	4.00	40.0	480	1.200	320	0.800	240	0.600	621	1.553
		DRH0836	115	4.50	35.2	475	1.350	317	0.900	238	0.675	621	1.763
		DRH0840	127	5.00	31.2	468	1.500	312	1.000	234	0.750	615	1.972
		DRH0844	139	5.50	28.8	475	1.650	317	1.100	238	0.825	628	2.182
		DRH0848	152	6.00	25.6	461	1.800	307	1.200	230	0.900	612	2.392
		DRH0856	178	7.00	22.4	470	2.100	314	1.400	235	1.050	630	2.811
		DRH0864	203	8.00	19.2	461	2.400	307	1.600	230	1.200	620	3.230
		DRH0896	305	12.00	12.0	432	3.600	288	2.400	216	1.800	589	4.908
1 1/4" 32mm	5/8" 15.5mm	DRH1012	38	1.50	212.0	954	0.450	636	0.300	477	0.225	954	0.450
		DRH1014	44	1.75	181.6	953	0.525	636	0.350	476	0.262	1017	0.560
		DRH1016	51	2.00	149.6	898	0.600	598	0.400	449	0.300	950	0.635
		DRH1020	64	2.50	117.6	882	0.750	588	0.500	441	0.375	964	0.820
		DRH1024	76	3.00	95.2	857	0.900	571	0.600	428	0.450	957	1.005
		DRH1028	89	3.50	75.2	790	1.050	526	0.700	395	0.525	895	1.190
		DRH1032	102	4.00	66.4	797	1.200	531	0.800	398	0.600	913	1.375
		DRH1036	115	4.50	58.4	788	1.350	526	0.900	394	0.675	911	1.560
		DRH1040	127	5.00	49.6	744	1.500	496	1.000	372	0.750	866	1.745
		DRH1048	152	6.00	42.4	763	1.800	509	1.200	382	0.900	897	2.115
		DRH1056	178	7.00	36.8	773	2.100	515	1.400	386	1.050	914	2.485
		DRH1064	203	8.00	32.8	787	2.400	525	1.600	394	1.200	936	2.855
		DRH1080	254	10.00	25.6	768	3.000	512	2.000	384	1.500	920	3.595
		DRH1096	305	12.00	20.8	749	3.600	499	2.400	374	1.800	902	4.335



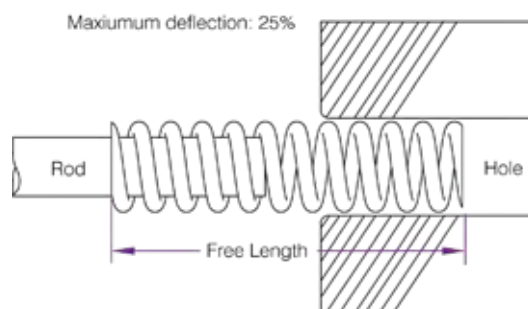
Silicone Chrome Die Springs
Raymond

Heavy Duty
Colour - GOLD



Hole Dia.	Rod Dia.	Product Code	Free Length		lb at 1/10" Defl	Maximum Deflection 30% of Free Length		Deflection for Average life 20% of Free Length		Deflection for Long life 15% of Free Length		Total Travel to Solid	
			mm	in		Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.
1 1/2" 38mm	3/4" 19mm	DRH1216	51	2.00	190.4	1142	0.600	762	0.400	571	0.300	1346	0.707
		DRH1220	64	2.50	148.8	1116	0.750	744	0.500	558	0.375	1446	0.972
		DRH1224	76	3.00	122.4	1102	0.900	734	0.600	551	0.450	1443	1.179
		DRH1228	89	3.50	106.4	1117	1.050	745	0.700	559	0.525	1535	1.443
		DRH1232	102	4.00	91.2	1094	1.200	730	0.800	547	0.600	1505	1.650
		DRH1236	115	4.50	78.4	1058	1.350	706	0.900	529	0.675	1478	1.885
		DRH1240	127	5.00	71.2	1068	1.500	712	1.000	534	0.750	1509	2.120
		DRH1244	139	5.50	64.0	1056	1.650	704	1.100	528	0.825	1508	2.357
		DRH1248	152	6.00	58.4	1051	1.800	701	1.200	526	0.900	1514	2.592
		DRH1256	178	7.00	49.6	1042	2.100	694	1.400	521	1.050	1520	3.064
		DRH1264	203	8.00	43.2	1037	2.400	691	1.600	518	1.200	1527	3.535
		DRH1280	254	10.00	34.4	1032	3.000	688	2.000	516	1.500	1540	4.477
		DRH1296	305	12.00	28.8	1037	3.600	691	2.400	518	1.800	1561	5.420
2" 51mm	1" 25mm	DRH1620	64	2.50	220.0	1650	0.750	1100	0.500	825	0.375	1982	0.901
		DRH1624	76	3.00	185.6	1670	0.900	1114	0.600	835	0.450	2189	1.147
		DRH1628	89	3.50	160.0	1680	1.050	1220	0.700	840	0.525	2227	1.392
		DRH1632	102	4.00	133.6	1603	1.200	1069	0.800	802	0.600	2188	1.638
		DRH1636	115	4.50	117.6	1588	1.350	1058	0.900	794	0.675	2216	1.884
		DRH1640	127	5.00	104.0	1560	1.500	1040	1.000	780	0.750	2214	2.129
		DRH1644	139	5.50	92.8	1531	1.650	1021	1.100	766	0.825	2204	2.375
		DRH1648	152	6.00	83.2	1498	1.800	998	1.200	749	0.900	2181	2.621
		DRH1656	178	7.00	73.6	1546	2.100	1030	1.400	773	1.050	2290	3.112
		DRH1664	203	8.00	64.0	1536	2.400	1024	1.600	768	1.200	2306	3.603
		DRH1680	254	10.00	48.8	1464	3.000	976	2.000	732	1.500	2238	4.586
		DRH1696	305	12.00	40.0	1440	3.600	960	2.400	720	1.800	2227	5.568

Die Springs Extra Heavy Duty

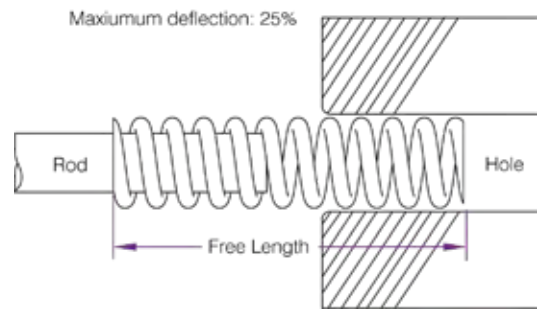
Silicone Chrome Die Springs
RaymondExtra Heavy Duty
Colour - GREEN

Hole Dia.	Rod Dia.	Product Code	Free Length		lb at 1/10" Defl	Maximum Deflection 25% of Free Length		Deflection for Average life 20% of Free Length		Deflection for Long life 15% of Free Length		Total Travel to Solid	
			mm	in		Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.
3/8" 10mm	3/16" 4.5mm	DRX0308	25	1	22	55	0.250	44	0.200	33	0.150	56	0.275
		DRX0310	32	1.25	17	53.2	0.312	43	0.250	32	0.187	54	0.350
		DRX0312	38	1.5	14.5	54.4	0.375	43	0.300	32	0.225	57	0.440
		DRX0314	44	1.75	11.5	50.4	0.437	39	0.350	29	0.262	55	0.480
		DRX0316	51	2	10	50	0.500	40	0.400	30	0.300	54	0.600
		DRX0320	64	2.5	8	50	0.625	40	0.500	30	0.375	55	0.770
		DRX0324	76	3	6.5	48.8	0.750	39	0.600	29	0.450	55	0.920
		DRX0396	305	12	1.5	45	3.000	36	2.400	27	1.800	58	3.850
1/2" 13mm	9/32" 7mm	DRX0408	25	1	32	80	0.250	64	0.200	48	0.150	103	0.295
		DRX0410	32	1.25	24	75.1	0.312	60	0.250	45	0.187	97	0.360
		DRX0412	38	1.5	20	75	0.375	60	0.300	45	0.225	103	0.470
		DRX0414	44	1.75	17	74.5	0.437	60	0.350	45	0.262	99	0.530
		DRX0416	51	2	14	70	0.500	56	0.400	42	0.300	126	0.680
		DRX0420	64	2.5	11.5	71.9	0.625	56	0.500	42	0.375	102	0.800
		DRX0424	76	3	9	67.5	0.750	54	0.600	41	0.450	102	0.980
5/8" 16mm	11/32" 8.5mm	DRX0508	25	1	63	157.5	0.250	126	0.200	95	0.150	208	0.280
		DRX0510	32	1.25	47	147.1	0.312	117	0.250	88	0.187	187	0.340
		DRX0512	38	1.5	38	142.5	0.375	114	0.300	86	0.225	184	0.420
		DRX0514	44	1.75	32	140.2	0.437	112	0.350	84	0.262	181	0.490
		DRX0516	51	2	29	145	0.500	116	0.400	87	0.300	180	0.560
		DRX0520	64	2.5	22	137.5	0.625	110	0.500	83	0.375	195	0.780
		DRX0524	76	3	18	135	0.750	108	0.600	81	0.450	200	0.980
3/4" 19mm	3/8" 9.5mm	DRX0608	25	1	140	350	0.250	280	0.200	210	0.150	335	0.215
		DRX0610	32	1.25	110	344.3	0.312	275	0.250	206	0.187	340	0.300
		DRX0612	38	1.5	89	333.8	0.375	268	0.300	200	0.225	420	0.460
		DRX0614	44	1.75	75	328.5	0.437	264	0.350	198	0.262	350	0.460
		DRX0616	51	2	63.5	317.5	0.500	254	0.400	190	0.300	330	0.510
		DRX0620	64	2.5	50	312.5	0.625	250	0.500	188	0.375	355	0.710
		DRX0624	76	3	40.5	303.7	0.750	243	0.600	182	0.450	345	0.840
		DRX0628	89	3.5	34.5	301.9	0.875	242	0.700	181	0.525	360	1.040
		DRX0632	102	4	30	300	1.000	240	0.800	180	0.600	360	1.200
		DRX0648	152	6.	19.5	292.5	1.500	234	1.200	176	0.900	380	1.850
1" 25mm	1/2" 12.5mm	DRX0812	38	1.5	184.8	693	0.375	555	0.300	416	0.225	632	0.342
		DRX0816	51	2	116	580	0.500	464	0.400	348	0.300	567	0.489
		DRX0820	64	2.5	89.6	560	0.625	448	0.500	336	0.375	571	0.637
		DRX0824	76	3	73.6	552	0.750	442	0.600	331	0.450	615	0.835
		DRX0828	89	3.5	62.4	546	0.875	437	0.700	328	0.525	613	0.982
		DRX0832	102	4	55.2	552	1.000	442	0.800	331	0.600	651	1.180
		DRX0840	127	5	43.2	540	1.375	432	1.000	324	0.750	659	1.526
		DRX0848	152	6	36	540	1.500	432	1.200	324	0.900	674	1.871
Wire 0.188 x 0.225													

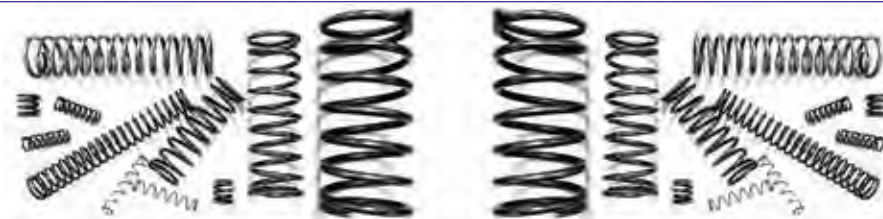


Silicone Chrome Die Springs
Raymond

Extra Heavy Duty
Colour - GREEN



Hole Dia.	Rod Dia.	Product Code	Free Length		lb at 1/10" Defl	Maximum Deflection 25% of Free Length		Deflection for Average life 20% of Free Length		Deflection for Long life 15% of Free Length		Total Travel to Solid	
			mm	in		Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.	Pressure Pounds	Length of Defl.
1 1/4" 32mm	5/8" 15.5mm	DRX1016	51	2	192	960	0.500	768	0.400	577	0.300	1002	0.522
		DRX1020	64	2.5	144	900	0.625	720	0.500	540	0.375	1045	0.726
		DRX1024	76	3	118.4	888	0.750	710	0.600	533	0.450	1102	0.931
		DRX1028	89	3.5	100.8	882	0.875	706	0.700	530	0.525	1144	1.135
		DRX1032	102	4	84	840	1.000	673	0.800	505	0.600	1075	1.280
		DRX1036	115	4.5	78.4	882	1.125	706	0.900	529	0.675	1164	1.485
		DRX1040	127	5	68	850	1.375	680	1.000	510	0.750	1149	1.689
		DRX1048	152	6	56	840	1.500	672	1.200	504	0.900	1142	2.039
1 1/2" 38mm	3/4" 19mm	DRX1216	51	2	376	1880	0.500	1505	0.400	1128	0.300	1950	0.495
		DRX1220	64	2.5	294.4	1840	0.625	1472	0.500	1104	0.375	1840	0.625
		DRX1224	76	3	231.2	1734	0.750	1387	0.600	1040	0.450	1896	0.820
		DRX1228	89	3.5	196	1715	0.875	1372	0.700	1029	0.525	1911	0.975
		DRX1232	102	4	171.2	1712	1.000	1370	0.800	1027	0.600	2001	1.169
		DRX1236	115	4.5	148	1665	1.125	1332	0.900	999	0.675	2017	1.363
		DRX1240	127	5	136	1700	1.375	1360	1.000	1020	0.750	2118	1.557
		DRX1248	152	6	110.4	1656	1.500	1325	1.200	994	0.900	2147	1.945
		DRX1264	203	8	80.8	1616	2.000	1293	1.600	970	1.200	2199	2.721
2" 51mm	1" 25mm	DRX1620	64	2.5	381.6	2385	0.625	1908	0.500	1431	0.375	2851	0.747
		DRX1624	76	3	312	2340	0.750	1872	0.600	1404	0.450	2702	0.866
		DRX1628	89	3.5	254.4	2226	0.875	1781	0.700	1336	0.525	2310	0.908
		DRX1632	102	4	220	2200	1.000	1760	0.800	1320	0.600	2691	1.223
		DRX1636	115	4.5	188.8	2124	1.125	1700	0.900	1274	0.675	2622	1.389
		DRX1640	127	5	172.8	2164	1.250	1728	1.000	1296	0.750	2428	1.405
		DRX1648	152	6	141.6	2124	1.500	1700	1.200	1275	0.900	2280	1.610
		DRX1664	203	8	100	2000	2.000	1600	1.600	1200	1.200	2234	2.234
		DRX1680	254	10	84	2100	2.500	1680	2.000	1260	1.500	2448	2.914
		DRX1696	305	12	71.2	2136	3.000	1710	2.410	1282	1.800	3184	4.472

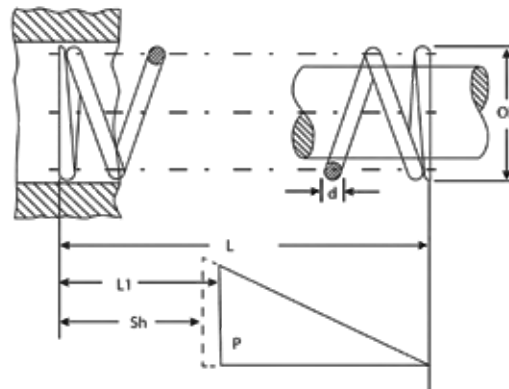


SPEC compression springs provide design engineers, draughtsmen, production and maintenance departments with precision-engineered springs in an economical and time saving way.

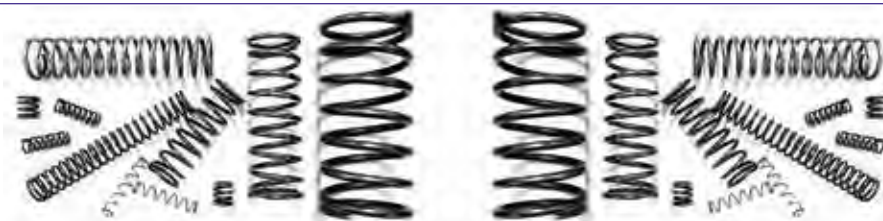
The SPEC service saves time and therefore money as design work and calculations are no longer required.

- Music wire ex-stock
- Stainless available upon request

Hales Australia is the official distributor for the SPEC Spring Range.



Product Code	Outside Dia. (OD)	Wire Dia (d).	Free Length (L) Approx.	Load Length (L1)	Solid Height (Sh) Approx.	Load (P) at L1	Spring Rate (R)
	mm	mm	mm	mm	mm	N	N/mm
C0120-014-0310	3.05	0.36	7.87	4.24	2.97	5.47	1.51
C0120-014-0500	3.05	0.36	12.70	6.68	4.27	5.47	0.91
C0120-014-0750	3.05	0.36	19.05	9.78	5.97	5.47	0.60
C0120-014-1000	3.05	0.36	25.40	12.90	7.65	5.47	0.44
C0120-014-1250	3.05	0.36	31.75	16.05	9.35	5.47	0.35
C0120-014-1500	3.05	0.36	38.10	19.71	11.02	5.47	0.30
C0120-016-0500	3.05	0.41	12.70	7.11	5.28	8.18	1.45
C0120-016-1250	3.05	0.41	31.75	17.15	11.76	8.18	0.56
C0120-016-1500	3.05	0.41	38.10	21.41	13.82	8.18	0.49
C0120-018-0500	3.05	0.46	12.70	7.75	6.30	11.39	2.29
C0120-018-0750	3.05	0.46	19.05	11.38	9.12	11.39	1.49
C0120-018-1250	3.05	0.46	31.75	19.00	14.20	11.39	0.89
C0120-018-1500	3.05	0.46	38.10	22.61	16.84	11.39	0.74
C0120-020-0500	3.05	0.51	12.70	8.59	7.24	14.72	3.57
C0120-020-0750	3.05	0.51	19.05	12.70	10.34	14.72	2.31
C0120-020-1000	3.05	0.51	25.40	16.81	13.46	14.72	1.72
C0120-020-1250	3.05	0.51	31.75	20.93	16.56	14.72	1.37
C0120-020-1500	3.05	0.51	38.10	25.02	19.66	14.72	1.12
C0120-022-0500	3.05	0.56	12.70	9.04	8.10	19.93	5.45
C0120-022-0750	3.05	0.56	19.05	13.41	11.71	19.93	3.54
C0120-022-1000	3.05	0.56	25.40	17.65	15.24	19.93	2.57
C0120-022-1250	3.05	0.56	31.75	22.02	18.77	19.93	2.05
C0148-023-0440	3.76	0.58	11.18	7.37	6.22	17.97	4.71
C0148-023-1000	3.76	0.58	25.40	16.15	12.57	17.97	1.94
C0180-012-1500	4.57	0.30	38.10	15.24	4.37	2.40	0.11
C0180-014-0500	4.57	0.36	12.70	5.33	2.54	3.74	0.51
C0180-014-0750	4.57	0.36	19.05	7.82	3.30	3.74	0.33
C0180-014-1000	4.57	0.36	25.40	10.16	4.09	3.74	0.25
C0180-014-1250	4.57	0.36	31.75	12.34	4.85	3.74	0.19
C0180-014-1500	4.57	0.36	38.10	14.40	5.64	3.74	0.16
C0180-016-0500	4.57	0.41	12.70	5.21	3.15	5.56	0.74
C0180-016-0750	4.57	0.41	19.05	7.62	4.24	5.56	0.49
C0180-016-1000	4.57	0.41	25.40	10.97	5.18	5.56	0.39
C0180-016-1250	4.57	0.41	31.75	13.08	6.22	5.56	0.30
C0180-016-1500	4.57	0.41	38.10	15.42	7.24	5.56	0.25
C0180-018-0500	4.57	0.46	12.70	6.07	3.66	7.83	1.17
C0180-018-0750	4.57	0.46	19.05	8.20	5.26	7.83	0.72
C0180-018-1000	4.57	0.46	25.40	11.43	6.40	7.83	0.56
C0180-018-1250	4.57	0.46	31.75	14.55	7.70	7.83	0.46
C0180-018-1500	4.57	0.46	38.10	16.81	9.02	7.83	0.37
C0180-018-1750	4.57	0.46	44.45	19.61	10.31	7.83	0.32

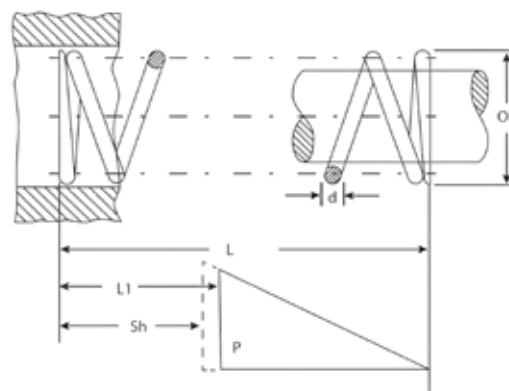


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The SPEC service saves time and therefore money as design work and calculations are no longer required.

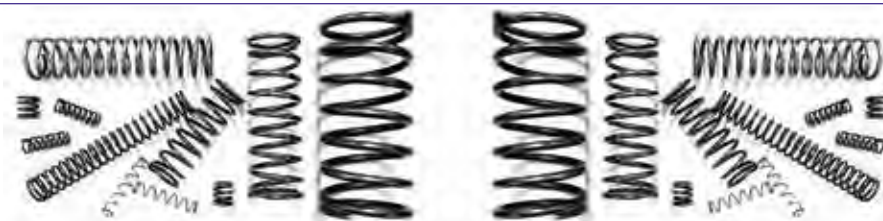
- Music wire ex-stock
- Stainless available upon request

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Product Code	Outside Dia. (OD)	Wire Dia (d).	Free Length (L) Approx.	Load Length (L1)	Solid Height (Sh) Approx.	Load (P) at L1	Spring Rate (R)
	mm	mm	mm	mm	mm	N	N/mm
C0180-020-0500	4.57	0.51	12.70	6.68	4.47	10.19	1.70
C0180-020-0750	4.57	0.51	19.05	9.75	6.07	10.19	1.10
C0180-020-1000	4.57	0.51	25.40	12.83	7.67	10.19	0.81
C0180-020-1500	4.57	0.51	38.10	18.72	10.90	10.19	0.53
C0180-020-1750	4.57	0.51	44.45	22.05	12.50	10.19	0.46
C0180-022-0500	4.57	0.56	12.70	7.11	4.88	13.92	2.49
C0180-022-0750	4.57	0.56	19.05	9.88	7.11	13.92	1.52
C0180-022-1000	4.57	0.56	25.40	13.16	9.02	13.92	1.14
C0180-022-1250	4.57	0.56	31.75	16.46	10.92	13.92	0.91
C0180-022-1500	4.57	0.56	38.10	19.61	12.85	13.92	0.75
C0180-024-0250	4.57	0.61	6.35	4.06	3.63	16.95	7.40
C0180-024-0310	4.57	0.61	7.87	4.90	4.17	16.95	5.71
C0180-024-0380	4.57	0.61	9.65	5.89	4.80	16.95	4.50
C0180-024-0440	4.57	0.61	11.18	6.73	5.33	16.95	3.82
C0180-024-0500	4.57	0.61	12.70	7.57	5.89	16.95	3.31
C0180-024-0560	4.57	0.61	14.22	8.41	6.43	16.95	2.92
C0180-024-0620	4.57	0.61	15.75	9.27	6.96	16.95	2.61
C0180-024-0750	4.57	0.61	19.05	11.10	8.13	16.95	2.14
C0180-024-0880	4.57	0.61	22.35	12.93	9.30	16.95	1.80
C0180-024-1000	4.57	0.61	25.40	14.61	10.36	16.95	1.58
C0180-024-1120	4.57	0.61	28.45	16.28	11.43	16.95	1.40
C0180-024-1250	4.57	0.61	31.75	18.11	12.60	16.95	1.24
C0180-024-1500	4.57	0.61	38.10	21.64	14.86	16.95	1.03
C0180-024-1750	4.57	0.61	44.45	25.15	17.09	16.95	0.88
C0180-024-2000	4.57	0.61	50.80	28.68	19.33	16.95	0.77
C0180-026-0500	4.57	0.66	12.70	7.92	6.27	22.37	4.69
C0180-026-0750	4.57	0.66	19.05	11.56	8.94	22.37	2.98
C0180-026-1000	4.57	0.66	25.40	14.94	11.71	22.37	2.14
C0180-026-1250	4.57	0.66	31.75	18.57	14.27	22.37	1.70
C0180-026-1500	4.57	0.66	38.10	22.12	16.84	22.37	1.40
C0180-026-2000	4.57	0.66	50.80	29.13	21.97	22.37	1.03
C0180-032-0500	4.57	0.81	12.70	9.25	8.10	39.28	11.36
C0180-032-0750	4.57	0.81	19.05	13.61	11.58	39.28	7.23
C0180-032-1000	4.57	0.81	25.40	17.78	15.44	39.28	5.15
C0180-032-1250	4.57	0.81	31.75	21.92	19.00	39.28	3.99
C0180-032-1500	4.57	0.81	38.10	26.16	22.48	39.28	3.29
C0180-032-2000	4.57	0.81	50.80	34.77	29.46	39.28	2.45
C0210-018-0750	5.33	0.46	19.05	7.49	4.34	6.67	0.58
C0210-018-1500	5.33	0.46	38.10	14.38	7.47	6.67	0.28
C0210-018-1750	5.33	0.46	44.45	17.25	8.48	6.67	0.25
C0210-018-2000	5.33	0.46	50.80	19.00	9.53	6.67	0.21

Product Code	Outside Dia. (OD)	Wire Dia (d).	Free Length (L) Approx.	Load Length (L1)	Solid Height (Sh) Approx.	Load (P) at L1	Spring Rate (R)
	mm	mm	mm	mm	mm	N	N/mm
C0210-022-0250	5.33	0.56	6.35	3.56	2.87	11.52	4.13
C0210-022-1500	5.33	0.56	38.10	18.16	10.13	11.52	0.58
C0210-026-1500	5.33	0.66	38.10	20.68	13.54	18.42	1.05
C0240-020-0500	6.10	0.51	12.70	5.82	3.23	7.78	1.12
C0240-020-1000	6.10	0.51	25.40	11.02	5.08	7.78	0.54
C0240-020-1500	6.10	0.51	38.10	15.88	6.93	7.78	0.35
C0240-020-2000	6.10	0.51	50.80	21.16	8.79	7.78	0.26
C0240-022-1000	6.10	0.56	25.40	10.95	5.99	10.63	0.74
C0240-024-0500	6.10	0.61	12.70	6.45	4.27	12.99	2.08
C0240-024-0750	6.10	0.61	19.05	9.35	5.61	12.99	1.33
C0240-024-1000	6.10	0.61	25.40	12.24	6.96	12.99	0.98
C0240-024-1500	6.10	0.61	38.10	18.03	9.63	12.99	0.65
C0240-024-2000	6.10	0.61	50.80	23.34	12.32	12.99	0.47
C0240-026-0500	6.10	0.66	12.70	7.09	4.29	17.13	3.05
C0240-026-0560	6.10	0.66	14.22	7.57	4.78	17.13	2.57
C0240-026-0750	6.10	0.66	19.05	9.25	6.25	17.13	1.75
C0240-026-1000	6.10	0.66	25.40	12.19	7.95	17.13	1.30
C0240-026-1500	6.10	0.66	38.10	18.14	11.10	17.13	0.86
C0240-026-2000	6.10	0.66	50.80	23.65	14.25	17.13	0.63
C0240-029-0500	6.10	0.74	12.70	7.32	5.61	22.02	4.08
C0240-029-0750	6.10	0.74	19.05	10.62	7.57	22.02	2.61
C0240-029-1000	6.10	0.74	25.40	13.92	9.50	22.02	1.93
C0240-029-1120	6.10	0.74	28.45	15.49	10.41	22.02	1.70
C0240-029-1500	6.10	0.74	38.10	20.52	13.36	22.02	1.26
C0240-029-1750	6.10	0.74	44.45	23.83	15.29	22.02	1.07
C0240-029-2000	6.10	0.74	50.80	27.13	17.22	22.02	0.93
C0240-032-0500	6.10	0.81	12.70	7.95	5.89	30.65	6.44
C0240-032-0750	6.10	0.81	19.05	11.05	8.51	30.65	3.84
C0240-032-1000	6.10	0.81	25.40	14.40	10.95	30.65	2.78
C0240-032-1500	6.10	0.81	31.75	17.75	13.36	30.65	2.19
C0240-032-2000	6.10	0.81	38.10	21.11	15.65	30.65	1.80
C0240-035-0500	6.10	0.89	12.70	8.33	7.26	37.10	8.49
C0240-035-0750	6.10	0.89	19.05	12.14	9.93	37.10	5.37
C0240-035-1000	6.10	0.89	25.40	15.95	12.60	37.10	3.92
C0240-035-1500	6.10	0.89	38.10	23.57	17.93	37.10	2.56
C0240-035-2000	6.10	0.89	50.80	31.19	23.27	37.10	1.89
C0240-040-0500	6.10	1.02	12.70	9.12	8.53	53.51	14.93
C0240-040-0750	6.10	1.02	19.05	13.34	11.79	53.51	9.36
C0240-040-1000	6.10	1.02	25.40	17.55	15.04	53.51	6.83
C0240-040-1500	6.10	1.02	38.10	25.98	21.56	53.51	4.41
C0240-040-2000	6.10	1.02	50.80	34.42	28.09	53.51	3.27
C0240-045-1000	6.10	1.14	25.40	19.30	16.94	71.93	11.78
C0240-045-1500	6.10	1.14	38.10	28.65	24.36	71.93	7.60
C0300-022-0500	7.62	0.56	12.70	5.21	2.77	8.59	1.16
C0300-022-0750	7.62	0.56	19.05	7.06	3.61	8.59	0.72
C0300-022-1000	7.62	0.56	25.40	10.08	4.45	8.59	0.56
C0300-022-1500	7.62	0.56	38.10	14.76	5.89	8.59	0.37
C0300-022-1750	7.62	0.56	44.45	17.22	6.63	8.59	0.32
C0300-022-2000	7.62	0.56	50.80	18.11	7.34	8.59	0.26
C0300-022-2500	7.62	0.56	63.50	25.78	8.48	8.59	0.23
C0300-026-0500	7.62	0.66	12.70	5.56	3.63	13.88	1.94
C0300-026-0750	7.62	0.66	19.05	8.33	4.62	13.88	1.30
C0300-026-1000	7.62	0.66	25.40	9.93	5.94	13.88	0.89
C0300-026-1500	7.62	0.66	38.10	15.47	7.95	13.88	0.61
C0300-026-2000	7.62	0.66	50.80	20.32	10.01	13.88	0.46
C0300-026-2500	7.62	0.66	63.50	27.56	11.56	13.88	0.39
C0300-030-1750	7.62	0.76	44.45	21.26	11.61	19.66	0.84
C0300-032-0500	7.62	0.81	12.70	6.68	4.83	24.87	4.13
C0300-032-0750	7.62	0.81	19.05	9.50	6.48	24.87	2.61
C0300-032-1000	7.62	0.81	25.40	11.94	8.28	24.87	1.86
C0300-032-1500	7.62	0.81	38.10	18.11	11.43	24.87	1.24
C0300-032-2000	7.62	0.81	50.80	24.00	14.55	24.87	0.93
C0300-032-2500	7.62	0.81	63.50	31.32	16.66	24.87	0.77

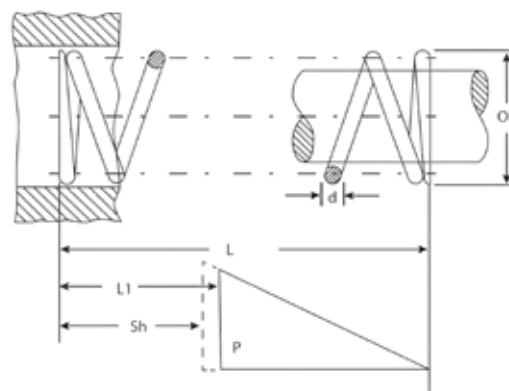


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	mm	mm	mm	mm	mm	N	N/mm
C0300-035-1000	7.62	0.89	25.40	13.54	9.40	31.85	2.68
C0300-040-0500	7.62	1.02	12.70	8.05	6.99	43.81	9.43
C0300-040-0750	7.62	1.02	19.05	11.66	9.35	43.81	5.92
C0300-040-1000	7.62	1.02	25.40	15.24	11.68	43.81	4.31
C0300-040-1250	7.62	1.02	31.75	18.82	14.05	43.81	3.40
C0300-040-1500	7.62	1.02	38.10	22.40	16.38	43.81	2.80
C0300-040-2000	7.62	1.02	50.80	29.59	21.08	43.81	2.07
C0300-040-2500	7.62	1.02	63.50	36.78	25.78	43.81	1.65
C0300-049-0500	7.62	1.25	12.70	9.27	8.33	79.98	23.28
C0300-049-0750	7.62	1.25	19.05	13.49	11.68	79.98	14.35
C0300-049-1000	7.62	1.25	25.40	17.70	14.73	79.98	10.38
C0300-049-1250	7.62	1.25	31.75	21.89	17.78	79.98	8.12
C0300-049-1500	7.62	1.25	38.10	26.11	20.85	79.98	6.67
C0300-049-2000	7.62	1.25	50.80	34.54	26.95	79.98	4.92
C0300-049-2500	7.62	1.25	63.50	42.98	33.05	79.98	3.90
C0300-049-3000	7.62	1.25	76.20	51.41	39.14	79.98	3.22
C0360-026-0500	9.14	0.66	12.70	5.46	2.97	11.65	1.61
C0360-026-0750	9.14	0.66	19.05	8.20	3.63	11.65	1.07
C0360-026-1000	9.14	0.66	25.40	9.12	4.60	11.65	0.72
C0360-026-1500	9.14	0.66	38.10	14.33	6.15	11.65	0.49
C0360-026-2000	9.14	0.66	50.80	21.18	7.57	11.65	0.37
C0360-032-0500	9.14	0.81	12.70	6.02	4.04	21.00	3.13
C0360-032-0750	9.14	0.81	19.05	9.02	5.05	21.00	2.08
C0360-032-1000	9.14	0.81	25.40	11.35	6.27	21.00	1.49
C0360-032-1500	9.14	0.81	38.10	16.03	8.74	21.00	0.95
C0360-032-2000	9.14	0.81	50.80	20.83	11.02	21.00	0.70
C0360-032-2500	9.14	0.81	63.50	28.27	12.65	21.00	0.60
C0360-035-0500	9.14	0.89	12.70	6.73	4.95	25.49	4.27
C0360-035-0750	9.14	0.89	19.05	9.63	6.27	25.49	2.70
C0360-035-1000	9.14	0.89	25.40	12.52	7.62	25.49	1.98
C0360-035-1500	9.14	0.89	38.10	18.29	10.26	25.49	1.28
C0360-035-2000	9.14	0.89	50.80	24.05	12.93	25.49	0.95
C0360-035-2500	9.14	0.89	63.50	29.82	15.60	25.49	0.75
C0360-038-0500	9.14	0.97	12.70	7.01	5.05	33.94	5.97
C0360-038-0750	9.14	0.97	19.05	9.73	6.76	33.94	3.64
C0360-038-1000	9.14	0.97	25.40	12.47	8.43	33.94	2.63
C0360-038-1500	9.14	0.97	38.10	17.91	11.81	33.94	1.68
C0360-038-2000	9.14	0.97	50.80	23.88	14.91	33.94	1.26
C0360-038-2500	9.14	0.97	63.50	29.49	18.06	33.94	0.10
C0360-040-0500	9.14	1.02	12.70	7.34	5.94	37.01	6.90
C0360-040-0750	9.14	1.02	19.05	10.49	7.67	37.01	4.32

Product Code	Outside Dia. (OD)	Wire Dia (d).	Free Length (L) Approx.	Load Length (L1)	Solid Height (Sh) Approx.	Load (P) at L1	Spring Rate (R)
	mm	mm	mm	mm	mm	N	N/mm
C0360-040-1000	9.14	1.02	25.40	13.64	9.40	37.01	3.15
C0360-040-1500	9.14	1.02	38.10	19.96	12.83	37.01	2.05
C0360-040-2000	9.14	1.02	50.80	26.29	16.28	37.01	1.51
C0360-040-2500	9.14	1.02	63.50	32.59	19.74	37.01	1.19
C0360-049-0500	9.14	1.25	12.70	8.71	7.44	64.72	16.19
C0360-049-0750	9.14	1.25	19.05	12.57	9.75	64.72	9.98
C0360-049-1000	9.14	1.25	25.40	16.43	12.04	64.72	7.21
C0360-049-1250	9.14	1.25	31.75	20.29	14.35	64.72	5.65
C0360-049-1500	9.14	1.25	38.10	24.18	16.66	64.72	4.64
C0360-049-2000	9.14	1.25	50.80	31.90	21.26	64.72	3.43
C0360-049-2500	9.14	1.25	63.50	39.65	25.88	64.72	2.71
C0360-049-3500	9.14	1.25	88.90	55.09	35.10	64.72	1.91
C0360-055-1500	9.14	1.40	38.10	25.83	19.74	89.58	7.30
C0360-055-2000	9.14	1.40	50.80	34.11	25.32	89.58	5.37
C0390047-2000	9.91	1.19	50.80	28.02	18.97	53.82	2.36
C0420-035-0750	10.67	0.89	19.05	8.99	5.36	22.02	2.19
C0420-035-1000	10.67	0.89	25.40	11.63	6.35	22.02	1.59
C0420-035-1500	10.67	0.89	38.10	16.94	8.33	22.02	1.03
C0420-038-0750	10.67	0.97	19.05	7.49	5.66	29.36	2.54
C0420-038-1000	10.67	0.97	25.40	10.16	6.83	29.36	1.93
C0420-038-1500	10.67	0.97	38.10	14.73	9.45	29.36	1.26
C0420-038-2000	10.67	0.97	50.80	23.29	11.58	29.36	1.07
C0420-038-2500	10.67	0.97	63.50	28.85	13.51	29.36	0.84
C0420-042-0750	10.67	1.07	19.05	8.76	6.30	39.59	3.85
C0420-042-1000	10.67	1.07	25.40	11.30	7.87	39.59	2.80
C0420-042-1500	10.67	1.07	38.10	16.51	10.90	39.59	1.84
C0420-042-2000	10.67	1.07	50.80	22.89	14.17	39.59	1.42
C0420-042-2500	10.67	1.07	63.50	30.71	16.00	39.59	1.21
C0420-048-1000	10.67	1.22	25.40	14.17	10.34	53.25	4.74
C0420-048-1500	10.67	1.22	38.10	20.65	14.02	53.25	3.05
C0420-048-2000	10.67	1.22	50.80	27.13	17.73	53.25	2.26
C0420-055-1000	10.67	1.40	25.40	15.24	11.53	80.07	7.88
C0420-055-1500	10.67	1.40	38.10	22.35	16.38	80.07	5.08
C0420-055-2000	10.67	1.40	50.80	29.34	21.97	80.07	3.73
C0420-055-2500	10.67	1.40	63.50	36.32	26.67	80.07	2.94
C0420-063-0500	10.67	1.60	12.70	9.17	8.76	112.85	31.87
C0420-063-0750	10.67	1.60	19.05	13.16	12.09	112.85	19.11
C0420-063-1000	10.67	1.60	25.40	17.15	15.01	112.85	13.63
C0420-063-1500	10.67	1.60	38.10	25.10	20.85	112.85	8.68
C0420-063-2000	10.67	1.60	50.80	33.07	26.72	112.85	6.35
C0420-063-2250	10.67	1.60	57.15	37.06	29.64	112.85	5.62
C0420-063-2500	10.67	1.60	63.50	41.05	32.56	112.85	5.02
C0455-039-1500	11.56	0.99	38.10	17.32	8.99	27.62	1.33
C0480-035-1000	12.19	0.89	25.40	8.94	5.66	20.86	1.26
C0480-035-1500	12.19	0.89	38.10	12.78	7.29	20.86	0.82
C0480-035-2000	12.19	0.89	50.80	16.64	8.92	20.86	0.61
C0480-035-2500	12.19	0.89	63.50	20.96	10.52	20.86	0.49
C0480-035-3000	12.19	0.89	76.20	24.33	12.14	20.86	0.40
C0480-038-0500	12.19	0.97	12.70	5.08	3.66	26.69	3.50
C0480-038-1000	12.19	0.97	25.40	9.40	5.59	26.69	1.66
C0480-038-1500	12.19	0.97	38.10	12.70	7.75	26.69	1.05
C0480-038-2000	12.19	0.97	50.80	19.20	9.86	26.69	0.84
C0480-038-2500	12.19	0.97	63.50	27.05	10.90	26.69	0.74
C0480-038-3000	12.19	0.97	76.20	32.26	12.55	26.69	0.61
C0480-042-0500	12.19	1.07	12.70	5.59	4.24	34.70	4.90
C0480-042-1000	12.19	1.07	25.40	10.16	6.68	34.70	2.28
C0480-042-1500	12.19	1.07	38.10	14.73	9.09	34.70	1.49
C0480-042-2000	12.19	1.07	50.80	21.23	11.73	34.70	1.17
C0480-042-2500	12.19	1.07	63.50	28.58	13.21	34.70	1.00
C0480-042-3000	12.19	1.07	76.20	34.04	15.29	34.70	0.82
C0480-051-0500	12.19	1.30	12.70	7.52	6.48	55.65	10.73
C0480-051-1000	12.19	1.30	25.40	13.72	9.75	55.65	4.76
C0480-051-1500	12.19	1.30	38.10	19.91	13.03	55.65	3.06

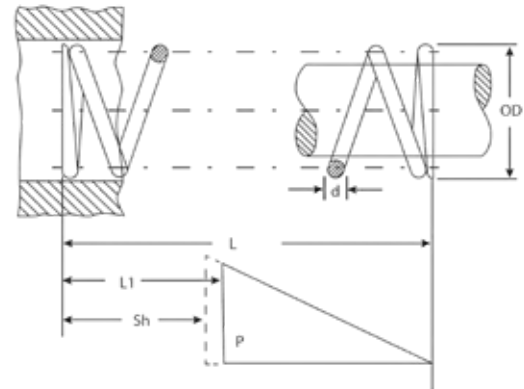


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Product Code	Outside Dia. (OD)	Wire Dia (d).	Free Length (L) Approx.	Load Length (L1)	Solid Height (Sh) Approx.	Load (P) at L1	Spring Rate (R)
	mm	mm	mm	mm	mm	N	N/mm
C0480-051-2000	12.19	1.30	50.80	26.09	16.28	55.65	2.26
C0480-051-2500	12.19	1.30	63.50	32.28	19.56	55.65	1.79
C0480-051-3000	12.19	1.30	76.20	38.48	22.83	55.65	1.47
C0480-055-0500	12.19	1.40	12.70	6.99	6.25	72.06	12.60
C0480-055-1000	12.19	1.40	25.40	13.59	9.93	72.06	6.13
C0480-055-1500	12.19	1.40	38.10	19.43	14.15	72.06	3.85
C0480-055-2000	12.19	1.40	50.80	26.31	18.42	72.06	2.94
C0480-055-2500	12.19	1.40	63.50	32.56	22.20	72.06	2.33
C0480-055-3000	12.19	1.40	76.20	40.56	24.92	72.06	2.01
C0480-063-0500	12.19	1.60	12.70	7.82	7.52	102.31	21.00
C0480-063-0750	12.19	1.60	19.05	11.56	9.86	102.31	13.65
C0480-063-1000	12.19	1.60	25.40	15.11	12.32	102.31	9.98
C0480-063-1500	12.19	1.60	38.10	22.73	16.89	102.31	6.65
C0480-063-2000	12.19	1.60	50.80	29.87	22.73	102.31	4.88
C0480-063-2250	12.19	1.60	57.15	33.40	25.12	102.31	4.31
C0480-063-2500	12.19	1.60	63.50	36.96	27.51	102.31	3.85
C0480-0632750	12.19	1.60	69.85	40.56	29.90	102.31	3.48
C0480-063-3000	12.19	1.60	76.20	44.12	32.28	102.31	3.19
C0480-072-2000	12.19	1.83	50.80	33.99	26.70	144.48	8.58
C0600-049-1000	15.24	1.25	25.40	12.22	7.54	37.37	2.84
C0600-049-1500	15.24	1.25	38.10	17.60	9.65	37.37	1.82
C0600-049-2000	15.24	1.25	50.80	23.01	11.76	37.37	1.35
C0600-049-2500	15.24	1.25	63.50	28.40	13.87	37.37	1.07
C0600-049-3000	15.24	1.25	76.20	33.78	15.98	37.37	0.88
C0600-055-1000	15.24	1.40	25.40	12.70	7.72	53.38	4.20
C0600-055-1500	15.24	1.40	38.10	17.78	10.67	53.38	2.63
C0600-055-2000	15.24	1.40	50.80	23.83	14.27	53.38	1.98
C0600-055-2500	15.24	1.40	63.50	29.26	16.94	53.38	1.56
C0600-055-3000	15.24	1.40	76.20	36.17	19.10	53.38	1.33
C0600-063-1000	15.24	1.60	25.40	13.34	9.60	80.07	6.65
C0600-063-1500	15.24	1.60	38.10	19.05	13.36	80.07	4.20
C0600-063-2000	15.24	1.60	50.80	25.40	17.78	80.07	3.15
C0600-063-2500	15.24	1.60	63.50	31.29	21.23	80.07	2.49
C0600-063-3000	15.24	1.60	76.20	39.57	23.55	80.07	2.19
C0600-072-1000	15.24	1.83	25.40	14.35	12.75	106.76	9.63
C0600-072-1500	15.24	1.83	38.10	21.08	17.55	106.76	6.30
C0600-072-2000	15.24	1.83	50.80	28.96	21.54	106.76	4.90
C0600-072-2500	15.24	1.83	63.50	37.11	26.24	106.76	4.04
C0600-072-3000	15.24	1.83	76.20	44.25	30.63	106.76	3.34
C0600-081-1250	15.24	2.06	63.50	43.56	28.04	145.41	7.30
C0600-085-3000	15.24	2.16	76.20	53.31	34.90	167.34	7.30

Product Code	Outside Dia. (OD)	Wire Dia (d).	Free Length (L) Approx.	Load Length (L1)	Solid Height (Sh) Approx.	Load (P) at L1	Spring Rate (R)
	mm	mm	mm	mm	mm	N	N/mm
C0720-055-1000	18.29	1.40	25.40	11.68	6.30	43.37	3.24
C0720-055-1500	18.29	1.40	38.10	16.00	8.46	43.37	2.01
C0720-055-2000	18.29	1.40	50.80	20.83	10.44	43.37	1.48
C0720-055-2500	18.29	1.40	63.50	27.81	13.18	43.37	1.20
C0720-055-3000	18.29	1.40	76.20	33.07	15.06	43.37	0.99
C0720-063-1000	18.29	1.60	25.40	10.67	8.74	62.28	4.20
C0720-063-1500	18.29	1.60	38.10	14.48	12.07	62.28	2.63
C0720-063-2000	18.29	1.60	50.80	18.54	15.29	62.28	1.93
C0720-063-2500	18.29	1.60	63.50	30.58	16.61	62.28	1.89
C0720-063-3000	18.29	1.60	76.20	36.25	19.08	62.28	1.56
C0720-072-1000	18.29	1.83	25.40	12.70	10.08	93.41	7.35
C0720-072-1500	18.29	1.83	38.10	17.78	14.07	93.41	4.55
C0720-072-2000	18.29	1.83	50.80	24.13	17.20	93.41	3.50
C0720-072-2500	18.29	1.83	63.50	32.39	20.70	93.41	2.99
C0720-072-3000	18.29	1.83	76.20	38.38	23.93	93.41	2.47
C0720-072-3500	18.29	1.83	88.90	44.42	27.15	93.41	2.10
C0720-072-4000	18.29	1.83	101.60	51.18	30.02	93.41	1.86
C0720-081-1000	18.29	2.06	25.40	15.34	12.90	127.75	12.71
C0720-081-1500	18.29	2.06	38.10	22.05	16.89	127.75	7.96
C0720-081-2000	18.29	2.06	50.80	28.75	20.90	127.75	5.79
C0720-081-2500	18.29	2.06	63.50	35.46	24.92	127.75	4.55
C0720-081-3000	18.29	2.06	76.20	42.16	28.93	127.75	3.75
C0720-081-3500	18.29	2.06	88.90	48.87	32.94	127.75	3.19
C0720-081-4000	18.29	2.06	101.60	55.52	36.96	127.75	2.78
C0720-085-3500	18.29	2.16	88.90	53.64	32.61	149.42	4.24
C0720-112-3000	18.29	2.85	76.20	56.29	40.77	309.55	15.54
C0720-112-3500	18.29	2.85	88.90	65.41	46.58	309.55	13.18
C0850-068-4000	21.59	1.73	101.60	52.83	23.80	48.66	1.00
C0850-074-1000	21.59	1.88	25.40	15.11	9.75	61.65	5.99
C0850-074-2000	21.59	1.88	50.80	28.45	15.70	61.65	2.77
C0850-074-3000	21.59	1.88	76.20	41.78	21.64	61.65	1.79
C0850-081-1500	21.59	2.06	38.10	22.86	14.55	79.31	5.20
C0850-081-2000	21.59	2.06	50.80	29.87	18.08	79.31	3.78
C0850-081-2500	21.59	2.06	63.50	36.88	21.59	79.31	2.98
C0850-081-3000	21.59	2.06	76.20	43.89	25.12	79.31	2.45
C0850-092-1500	21.59	2.34	38.10	24.56	17.42	112.94	8.35
C0850-092-2000	21.59	2.34	50.80	32.13	21.84	112.94	6.04
C0850-092-2500	21.59	2.34	63.50	39.67	26.24	112.94	4.74
C0850-092-3000	21.59	2.34	76.20	47.24	30.66	112.94	3.90
C0850-098-1500	21.59	2.49	38.10	25.48	18.97	134.51	10.64
C0850-098-2000	21.59	2.49	50.80	33.32	23.88	134.51	7.70
C0850-098-2500	21.59	2.49	63.50	41.20	28.75	134.51	6.02
C0850-098-3000	21.59	2.49	76.20	49.05	33.66	134.51	4.95
C0850-098-3500	21.59	2.49	88.90	56.90	38.53	134.51	4.20
C0975-092-1000	24.77	2.34	25.40	16.10	11.58	99.24	10.68
C0975-092-1250	24.77	2.34	31.75	19.61	13.34	99.24	8.17
C0975-092-1500	24.77	2.34	38.10	23.11	15.09	99.24	6.62
C0975-092-2000	24.77	2.34	50.80	30.12	18.59	99.24	4.80
C0975-092-3000	24.77	2.34	76.20	44.12	25.63	99.24	3.10
C0975-092-3500	24.77	2.34	88.90	51.13	29.13	99.24	2.63
C0975-092-4000	24.77	2.34	101.60	58.14	32.66	99.24	2.28
C0975-096-1000	24.77	2.44	25.40	16.48	12.22	111.69	12.51
C0975-096-1250	24.77	2.44	31.75	20.07	14.12	111.69	9.56
C0975-096-1500	24.77	2.44	38.10	23.65	16.03	111.69	7.74
C0975-096-2000	24.77	2.44	50.80	30.84	19.81	111.69	5.58
C0975-096-2500	24.77	2.44	63.50	38.02	23.62	111.69	4.38
C0975-096-3000	24.77	2.44	76.20	45.19	27.41	111.69	3.61
C0975-096-3500	24.77	2.44	88.90	52.37	31.19	111.69	3.06
C0975-105-1000	24.77	2.67	25.40	17.30	13.67	143.19	17.68
C0975-105-1500	24.77	2.67	38.10	24.87	18.11	143.19	10.82
C0975-105-2000	24.77	2.67	50.80	32.46	22.56	143.19	7.81
C0975-105-2500	24.77	2.67	63.50	40.03	26.97	143.19	6.09
C0975-105-3000	24.77	2.67	76.20	47.60	31.42	143.19	5.01

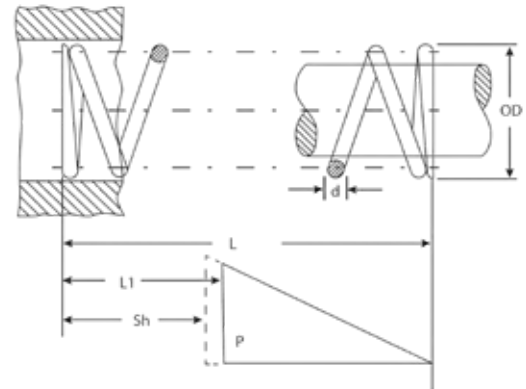


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	mm	mm	mm	mm	mm	N	N/mm
C0975-105-3500	24.77	2.67	88.90	55.19	35.84	143.19	4.25
C0975-105-4000	24.77	2.67	101.60	62.76	40.28	143.19	3.69
C0975-112-1500	24.77	2.85	38.10	25.81	19.71	171.17	13.91
C0975-112-2000	24.77	2.85	50.80	33.71	24.64	171.17	9.99
C0975-112-2500	24.77	2.85	63.50	41.58	29.57	171.17	7.81
C0975-112-3000	24.77	2.85	76.20	49.45	34.49	171.17	6.41
C0975-112-3500	24.77	2.85	88.90	57.35	39.45	171.17	5.43
C0975-125-1250	24.77	3.18	31.75	23.24	19.61	231.49	27.20
C0975-125-1500	24.77	3.18	38.10	27.46	22.53	231.49	21.75
C0975-125-2000	24.77	3.18	50.80	35.92	28.37	231.49	15.54
C0975-125-2500	24.77	3.18	63.50	44.35	34.21	231.49	12.09
C0975-125-3000	24.77	3.18	76.20	52.81	40.06	231.49	9.89
C0975-125-3500	24.77	3.18	88.90	61.24	45.90	231.49	8.37
C0975-125-4000	24.77	3.18	101.60	69.70	51.74	231.49	7.25
C0975-135-4000	24.77	3.43	101.60	73.53	55.96	286.73	10.20
C1225-096-1500	31.12	2.44	38.10	21.62	12.75	89.85	5.44
C1225-096-2000	31.12	2.44	50.80	28.02	15.29	89.85	3.94
C1225-096-2500	31.12	2.44	63.50	34.42	17.83	89.85	3.08
C1225-096-3000	31.12	2.44	76.20	40.82	20.37	89.85	2.54
C1225-096-3500	31.12	2.44	88.90	47.22	22.91	89.85	2.15
C1225-096-4000	31.12	2.44	101.60	53.62	25.45	89.85	1.87
C1225-096-4500	31.12	2.44	114.30	60.02	27.99	89.85	1.66
C1225-096-5000	31.12	2.44	127.00	66.42	30.53	89.85	1.49
C1225-112-1000	31.12	2.85	25.40	16.46	12.40	138.03	15.44
C1225-112-1500	31.12	2.85	38.10	23.39	15.82	138.03	9.38
C1225-112-2000	31.12	2.85	50.80	30.35	19.23	138.03	6.74
C1225-112-2500	31.12	2.85	63.50	37.29	22.63	138.03	5.27
C1225-112-3000	31.12	2.85	76.20	44.22	26.06	138.03	4.31
C1225-112-3500	31.12	2.85	88.90	51.16	29.46	138.03	3.66
C1225-112-4000	31.12	2.85	101.60	58.12	32.87	138.03	3.17
C1225-125-1250	31.12	3.18	31.75	21.16	16.23	187.14	17.64
C1225-125-1500	31.12	3.18	38.10	24.84	18.31	187.14	14.11
C1225-125-2000	31.12	3.18	50.80	32.26	22.48	187.14	10.08
C1225-125-2500	31.12	3.18	63.50	39.65	26.62	187.14	7.84
C1225-125-3000	31.12	3.18	76.20	47.04	30.78	187.14	6.42
C1225-125-4000	31.12	3.18	101.60	61.85	39.09	187.14	4.71
C1225-125-5000	31.12	3.18	127.00	76.66	47.37	187.14	3.71
C1225-135-1500	31.12	3.43	38.10	25.93	20.19	231.44	19.02
C1225-135-2000	31.12	3.43	50.80	33.71	24.94	231.44	13.53
C1225-135-3000	31.12	3.43	76.20	49.23	34.39	231.44	8.58
C1225-135-3500	31.12	3.43	88.90	56.97	39.12	231.44	7.25

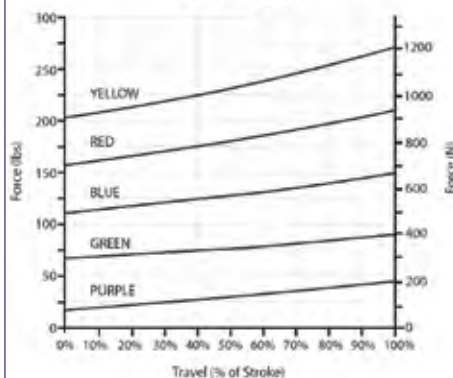
Product Code	Outside Dia. (OD)	Wire Dia (d).	Free Length (L) Approx.	Load Length (L1)	Solid Height (Sh) Approx.	Load (P) at L1	Spring Rate (R)
	mm	mm	mm	mm	mm	N	N/mm
C1225-148-1500	31.12	3.76	38.10	27.31	22.56	298.03	27.58
C1225-148-2000	31.12	3.76	50.80	35.51	28.04	298.03	19.50
C1225-148-3000	31.12	3.76	76.20	51.94	38.96	298.03	12.29
C1225-148-3500	31.12	3.76	88.90	60.17	44.42	298.03	10.36
C1225-148-4000	31.12	3.76	101.60	68.38	49.91	298.03	8.96
C1225-148-4500	31.12	3.76	114.30	76.61	55.37	298.03	7.89
C1225-148-5000	31.12	3.76	127.00	84.81	60.83	298.03	7.05
C1460-112-2000	37.08	2.85	50.80	28.32	15.98	116.68	5.18
C1460-112-3000	37.08	2.85	76.20	41.07	20.96	116.68	3.33
C1460-125-1500	37.08	3.18	38.10	23.19	15.65	158.40	10.62
C1460-125-2000	37.08	3.18	50.80	29.95	18.75	158.40	7.60
C1460-125-3000	37.08	3.18	76.20	43.41	24.92	158.40	4.83
C1460-125-4000	37.08	3.18	101.60	56.90	31.09	158.40	3.54
C1460-135-2000	37.08	3.43	50.80	31.19	20.90	196.12	9.99
C1460-135-3000	37.08	3.43	76.20	45.26	28.02	196.12	6.34
C1460-135-4000	37.08	3.43	101.60	59.33	35.38	196.12	4.64
C1460-148-2000	37.08	3.76	50.80	32.82	23.70	252.93	14.05
C1460-148-3000	37.08	3.76	76.20	47.68	32.08	252.93	8.86
C1460-148-4000	37.08	3.76	101.60	62.53	40.46	252.93	6.48
C1460-162-2000	37.08	4.12	50.80	34.54	26.64	324.45	19.95
C1460-162-3000	37.08	4.12	76.20	50.24	36.40	324.45	12.50
C1460-162-4000	37.08	4.12	101.60	65.94	46.15	324.45	9.10
C1460-162-5000	37.08	4.12	127.00	81.64	55.91	324.45	7.14
C1687-135-2000	42.85	3.43	50.80	29.49	18.14	170.81	8.02
C1687-135-3000	42.85	3.43	76.20	42.57	23.67	170.81	5.08
C1687-135-4000	42.85	3.43	101.60	55.65	29.21	170.81	3.71
C1687-135-5000	42.85	3.43	127.00	68.73	34.75	170.81	2.92
C1687-148-2000	42.85	3.76	50.80	30.94	20.62	220.50	11.10
C1687-148-3000	42.85	3.76	76.20	44.65	27.20	220.50	6.98
C1687-148-4000	42.85	3.76	101.60	58.39	33.81	220.50	5.09
C1687-148-5000	42.85	3.76	127.00	72.14	40.39	220.50	4.01
C1687-162-2000	42.85	4.12	50.80	32.49	23.32	283.13	15.44
C1687-162-3000	42.85	4.12	76.20	46.94	31.06	283.13	9.68
C1687-162-4000	42.85	4.12	101.60	61.42	38.84	283.13	7.04
C1687-162-5000	42.85	4.12	127.00	75.87	46.61	283.13	5.53
C1687-177-2000	42.85	4.50	50.80	34.11	26.14	361.46	21.65
C1687-177-3000	42.85	4.50	76.20	49.38	35.18	361.46	13.46
C1687-177-4000	42.85	4.50	101.60	64.64	44.22	361.46	9.77
C1687-177-5000	42.85	4.50	127.00	79.91	53.29	361.46	7.67
C1687-192-2000	42.85	4.88	50.80	35.69	28.88	451.94	29.91
C1687-192-3000	42.85	4.88	76.20	51.74	39.19	451.94	18.48
C1687-192-4000	42.85	4.88	101.60	67.79	49.53	451.94	13.37
C1687-192-5000	42.85	4.88	127.00	83.87	59.84	451.94	10.47
C1937-148-3000	49.20	3.76	76.20	42.27	23.34	193.14	5.69
C1937-148-4000	49.20	3.76	101.60	55.12	28.50	193.14	4.15
C1937-148-5000	49.20	3.76	127.00	67.95	33.63	193.14	3.27
C1937-162-2000	49.20	4.12	50.80	30.78	20.57	248.21	12.39
C1937-162-3000	49.20	4.12	76.20	44.25	26.72	248.21	7.75
C1937-162-4000	49.20	4.12	101.60	57.71	32.84	248.21	5.65
C1937-162-5000	49.20	4.12	127.00	71.15	38.99	248.21	4.45
C1937-177-4000	49.20	4.50	101.60	60.53	37.62	317.11	7.72
C1937-177-5000	49.20	4.50	127.00	74.68	44.86	317.11	6.06
C1937-177-6000	49.20	4.50	152.40	88.82	52.10	317.11	4.99
C1937-207-4500	49.20	5.26	114.30	73.99	51.92	488.10	12.09
C1937-207-5000	49.20	5.26	127.00	81.76	56.64	488.10	10.78
C1937-207-5500	49.20	5.26	139.70	89.51	61.39	488.10	9.71
C1937-207-6000	49.20	5.26	152.40	97.28	66.14	488.10	8.86



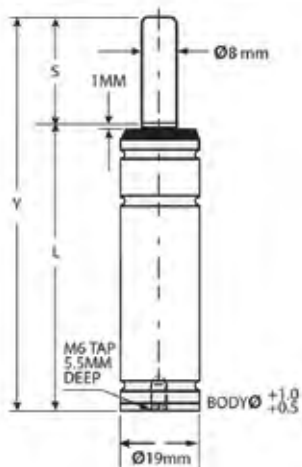
Product Specifications

Pressure Medium	Nitrogen Gas
Charging Pressure Range	Max.: 180 bar / 2610 psi Min.: 18 bar / 260 psi
Force Increase By Temperature	$\pm 0.3\%$ / °C
Max. Charging Pressure (bar at 20°C)	180
Min. Operating Temperature	0°C
Max. Operating Temperature	80°C
Max. Stroke / Minute	100-150 at 20°C
Max. Piston Rod Velocity	96 m/min.
Max. Utilised Stroke	100%
Repair Kit	Not Repairable
Inlet Valve	4018112

T2-90 Force Chart



T2-90



T2-90 Contact Force

Colour	Charge Pressure		Contact Force	
	bar	psi	N	lbs
Yellow	180	2610	905	203
Red	140	2030	704	158
Blue	100	1450	503	113
Green	60	870	302	68
Purple	18	260	89	20
Black*	18-180	260-2610	89-905	20-203

T2-90 Dimensional Information

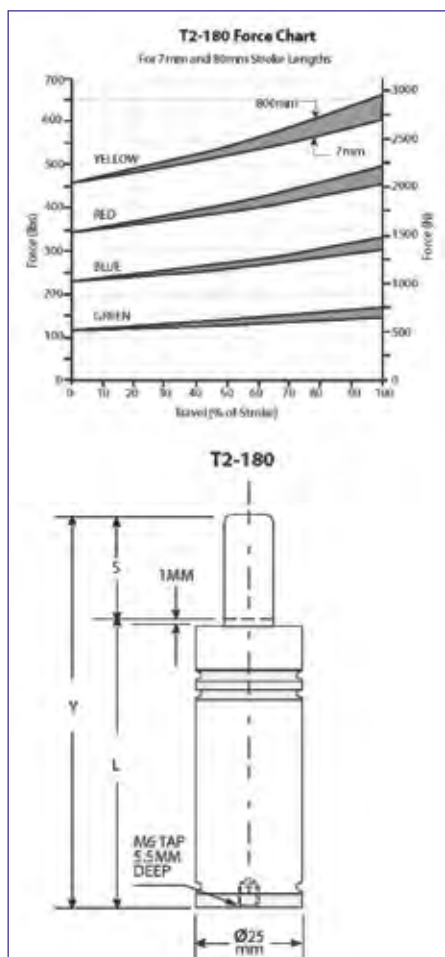
Product Code	Stroke Lengths		Y		L	
	mm	inch	mm	inch	mm	inch
T2-90X7	7	0.28	56	2.20	49	1.93
T2-90X10	10	0.39	62	2.44	52	2.05
T2-90X15	15	0.59	72	2.83	57	2.24
T2-90X25	25	0.98	92	3.62	67	2.64
T2-90X38	38.1	1.50	118.2	4.65	80.1	3.15
T2-90X50	50	1.97	142	5.59	92	3.62
T2-90X63	63.5	2.50	169	6.65	105.5	4.15
T2-90X80	80	3.15	205	8.07	125	4.92
T2-90X100	100	3.94	245	9.65	145	5.71
T2-90X125	125	4.92	295	11.61	170	6.69

* Custom Pressure: Please specify charging pressure or contact force required.



Product Specifications

Pressure Medium	Nitrogen Gas
Charging Pressure Range	Max.: 180 bar / 2610 psi Min.: 25 bar / 360 psi
Force Increase By Temperature	±0.3 % / °C
Max. Charging Pressure (bar at 20°C)	180
Min. Operating Temperature	0°C
Max. Operating Temperature	80°C
Max. Stroke / Minute	80-100 at 20°C
Max. Piston Rod Velocity	96 m/min.
Max. Utilised Stroke	100%
Repair Kit	T2SK2-180
Inlet Valve	4018112



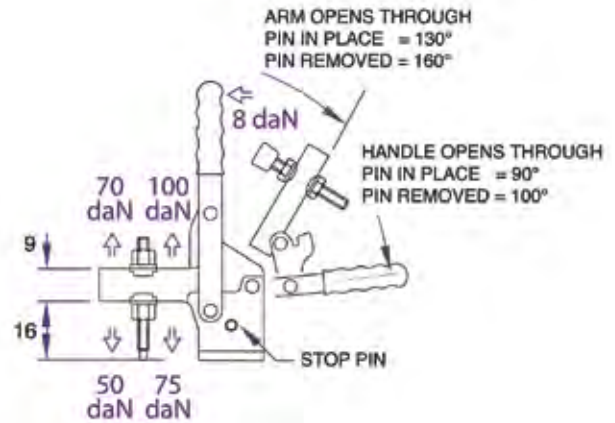
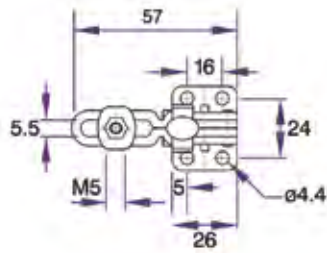
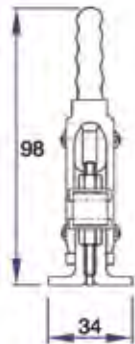
T2-180 Contact Force

Colour	Charge Pressure		Contact Force	
	bar	psi	N	lbs
Yellow	180	2610	2036	458
Red	135	1960	1527	343
Blue	90	1305	1018	229
Green	45	655	509	114
Black*	25-180	363-2610	280-2036	63-458

T2-180 Dimensional Information

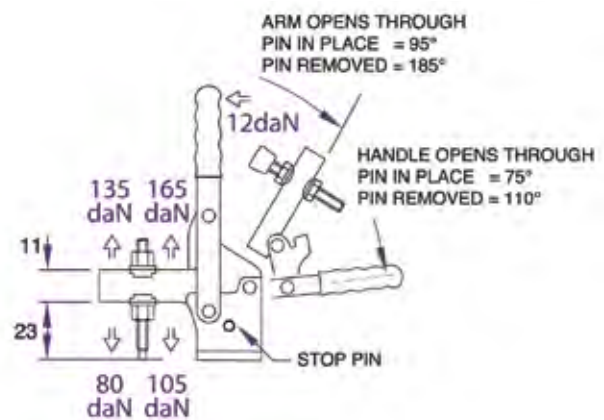
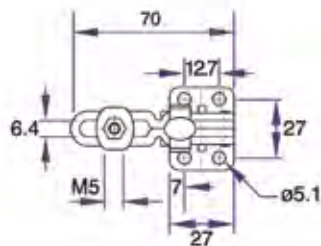
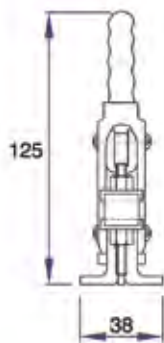
Product Code	Stroke Lengths		Y		L	
	mm	inch	mm	inch	mm	inch
T2-180X7	7	0.28	56	2.20	49	1.93
T2-180X10	10	0.39	62	2.44	52	2.05
T2-180X12.7	12.7	0.50	67.4	2.65	54.7	2.15
T2-180X15	15	0.59	72	2.83	57	2.24
T2-180X16	16	0.63	74	2.91	58	2.28
T2-180X25	25	0.98	92	3.62	67	2.64
T2-180X38	38.1	1.50	118.2	4.65	80.1	3.15
T2-180X50	50	1.97	142	5.59	92	3.62
T2-180X63	63.5	2.50	172	6.65	108.5	4.15
T2-180X75	75	2.95	195	7.68	120	4.72
T2-180X80	80	3.15	205	8.07	125	4.92
T2-180X100	100	3.94	245	9.65	145	5.71
T2-180X125	125	4.92	295	11.61	170	6.69

* Custom Pressure: Please specify charging pressure or contact force required.

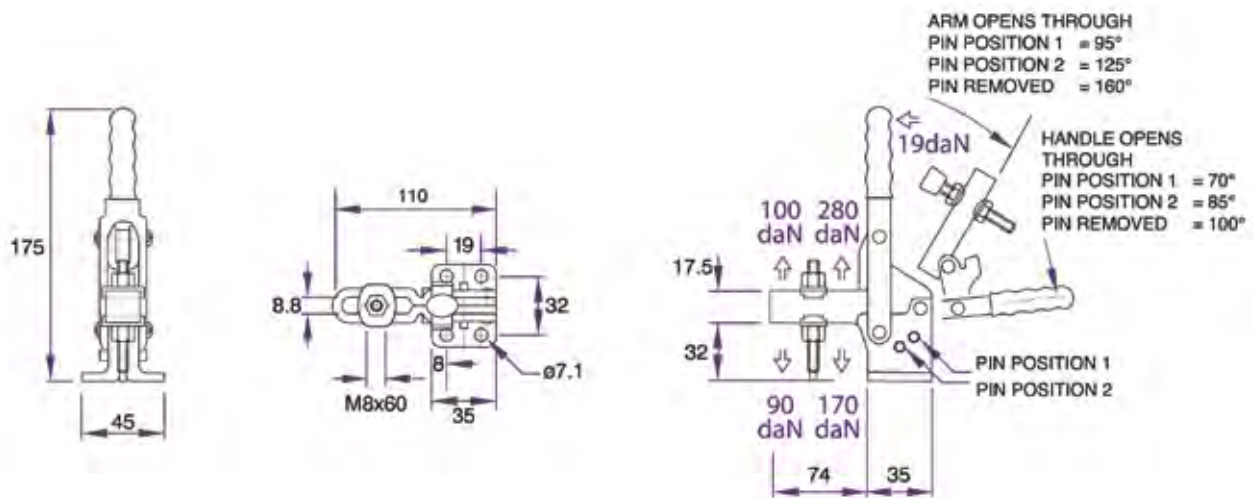


Product Code	Holding Force	Weight	Pin Opening Angle - Arm		Pin Opening Angle Handle	
			Pin in Place	Pin Removed	Pin in Place	Pin Removed
V75/2B	75 daN	.05 kg	130°	160°	90°	100°

Vertical Toggle Clamp - V150

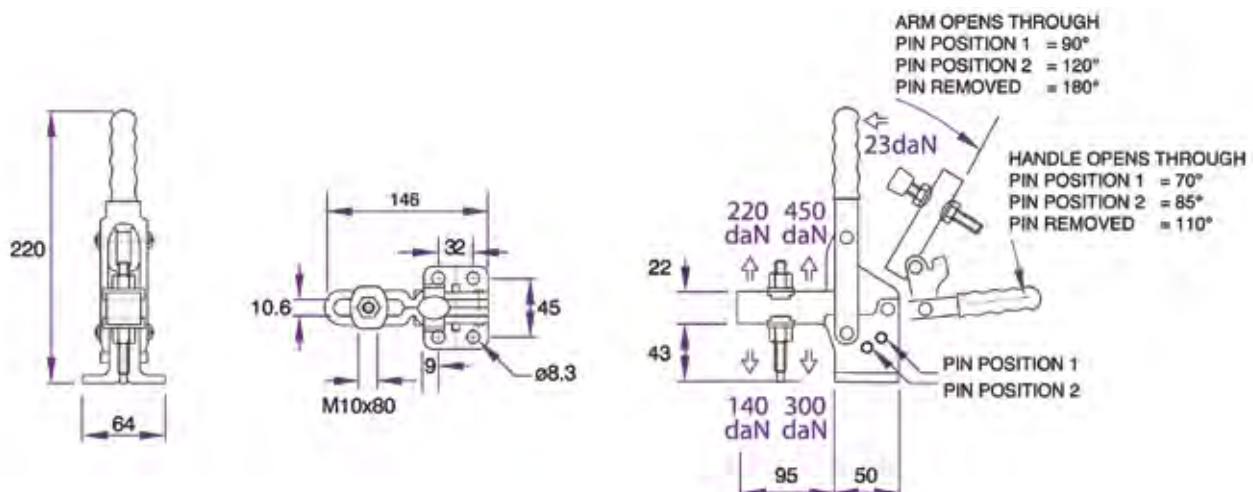


Product Code	Holding Force	Weight	Pin Opening Angle - Arm		Pin Opening Angle Handle	
			Pin in Place	Pin Removed	Pin in Place	Pin Removed
V150/2B	150 daN	.15 kg	95°	185°	75°	110°

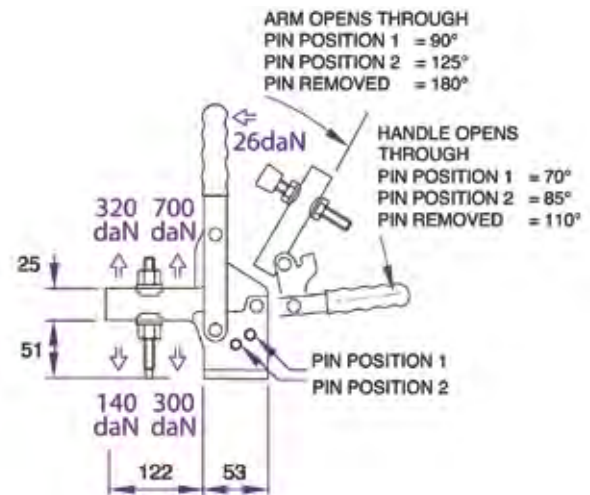
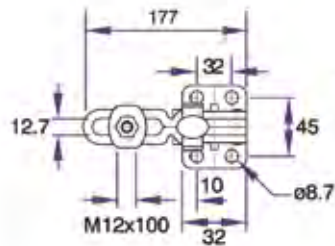
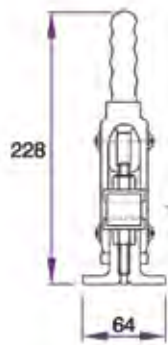


Product Code	Holding Force	Weight	Pin Opening Angle - Arm			Pin Opening Angle Handle		
			Pin in Place	Pin Removed	Removed	Pin in Place	Pin Removed	Removed
V250/2B	250 daN	.38 kg	95°	125°	160°	70°	85°	100°

Vertical Toggle Clamp - V350

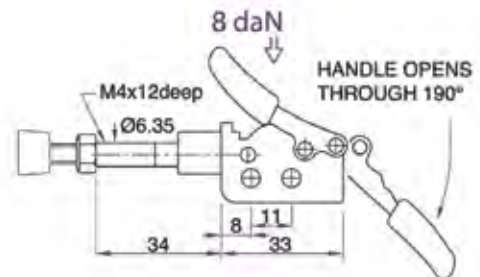
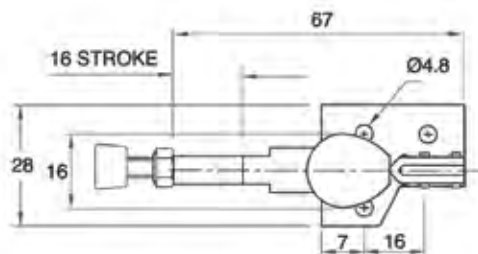
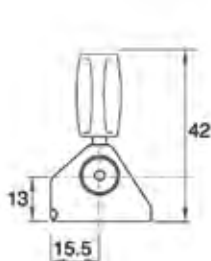


Product Code	Holding Force	Weight	Pin Opening Angle - Arm			Pin Opening Angle Handle		
			Pin in Place	Pin Removed	Removed	Pin in Place	Pin Removed	Removed
V350/2B	350 daN	.80 kg	90°	120°	180°	70°	80°	110°

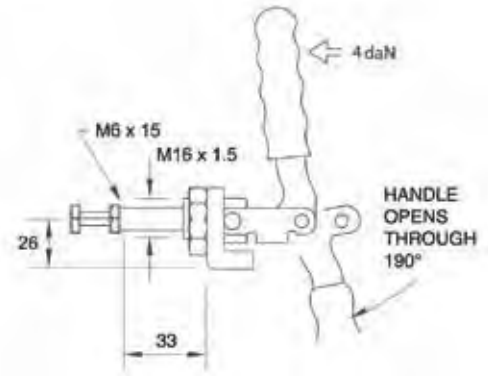
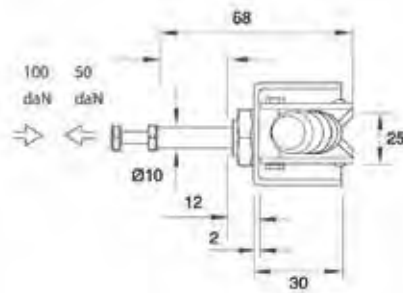
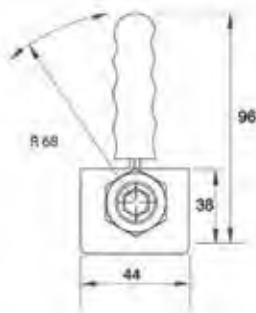


Product Code	Holding Force	Weight	Pin Opening Angle - Arm			Pin Opening Angle Handle		
			Pin in Place	Pin Removed	Removed	Pin in Place	Pin Removed	Removed
V450/2B	450 daN	1.35 kg	90°	125°	180°	70°	85°	110°

Push-Pull Clamp - P50

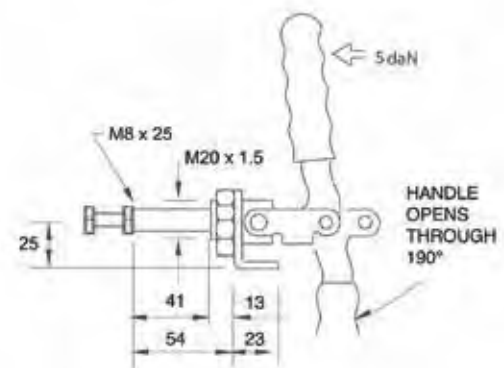
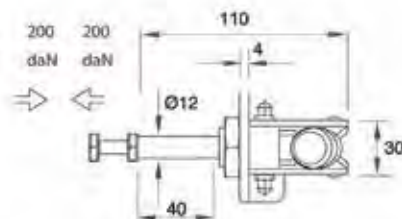
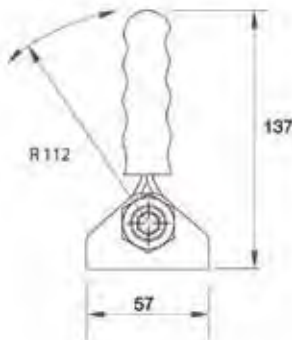


Product Code	Holding Force	Weight	Handle Opening Angle
P50	50 daN	0.05 kg	190°

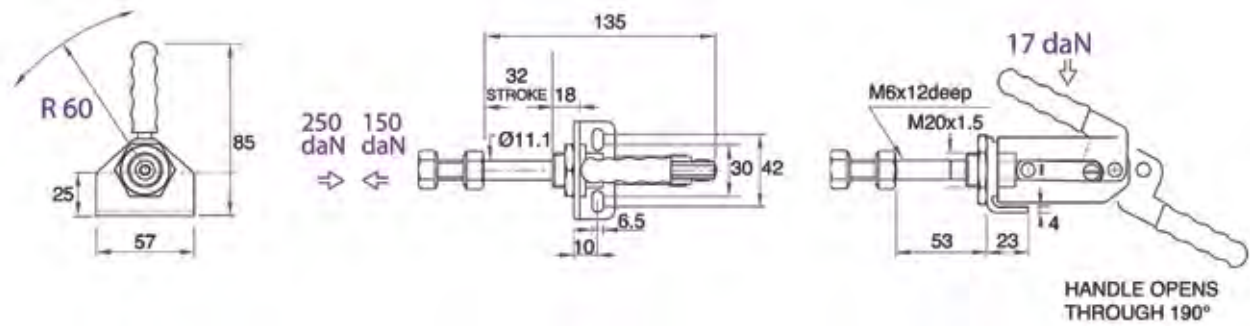


Product Code	Holding Force	Weight	Handle Opening Angle
P100	100 daN	0.15 kg	190°

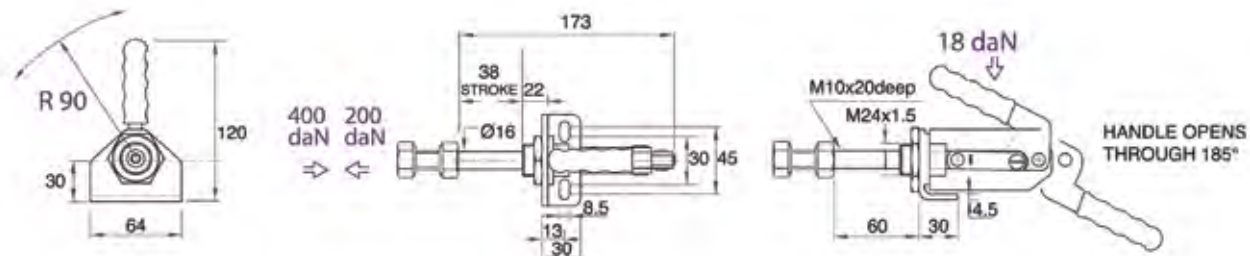
Push-Pull Clamp - P200



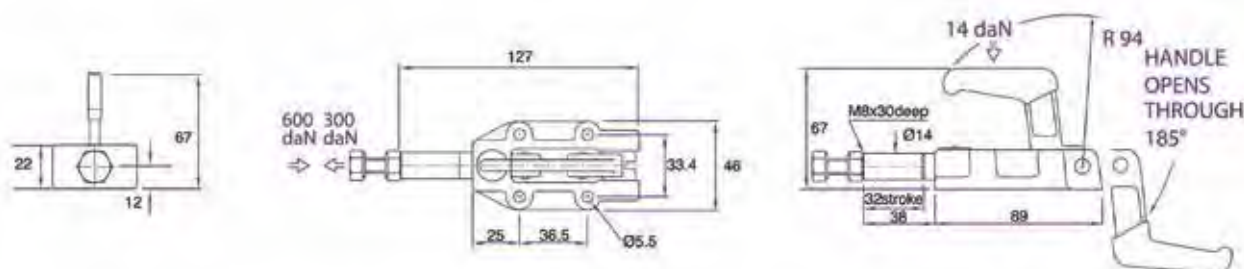
Product Code	Holding Force	Weight	Handle Opening Angle
P200	200 daN	0.35 kg	180°



Product Code	Holding Force	Weight	Handle Opening Angle
P250	250 daN	0.30 kg	190°

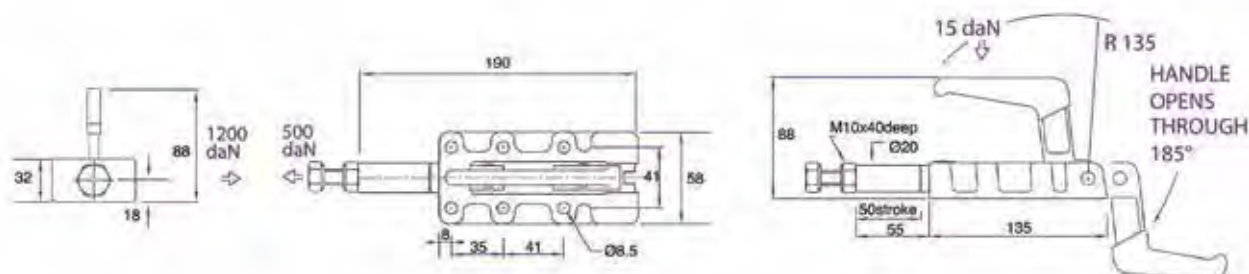


Product Code	Holding Force	Weight	Handle Opening Angle
P450	450 daN	0.75 kg	185°

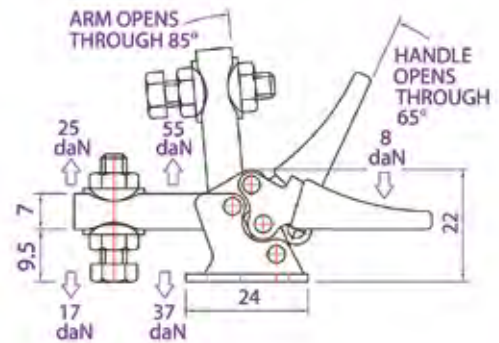
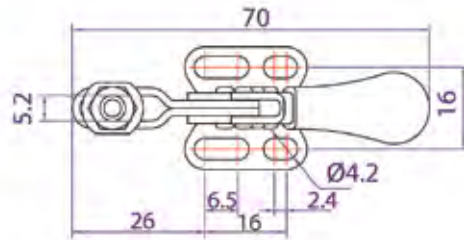
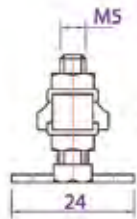


Product Code	Holding Force	Weight	Handle Opening Angle
P600	600 daN	0.45 kg	185°

Push-Pull Clamp - P1200

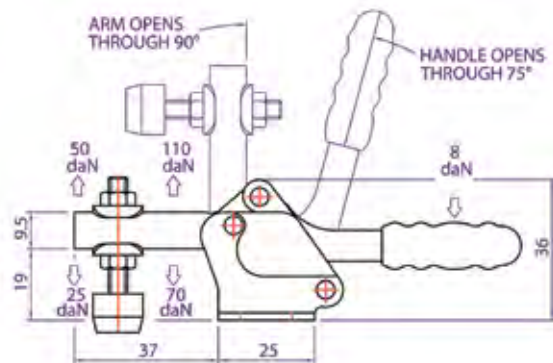
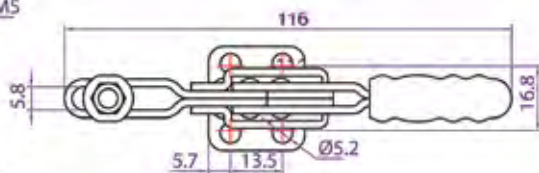
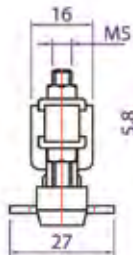


Product Code	Holding Force	Weight	Handle Opening Angle
P1200	1200 daN	1.35 kg	185°

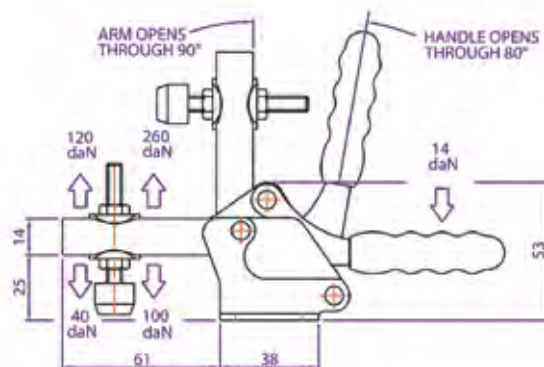
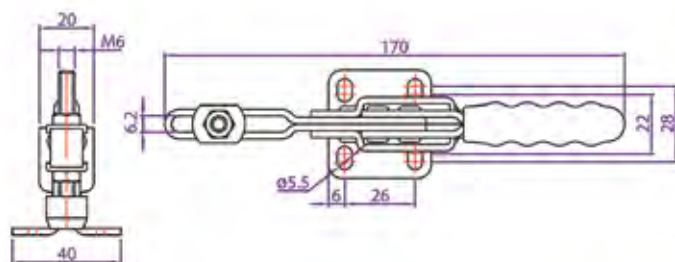


Product Code	Holding Force	Weight	Arm Opening Angle	Handle Opening Angle
H50/2B	50 daN	0.036 kg	85°	65°

Horizontal Toggle Clamp -H75

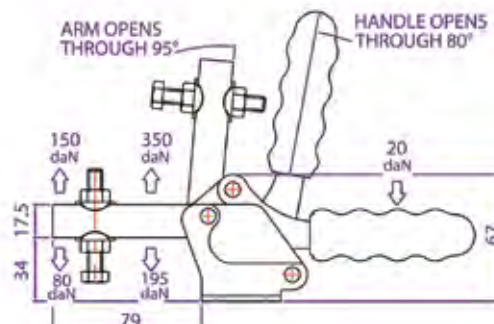
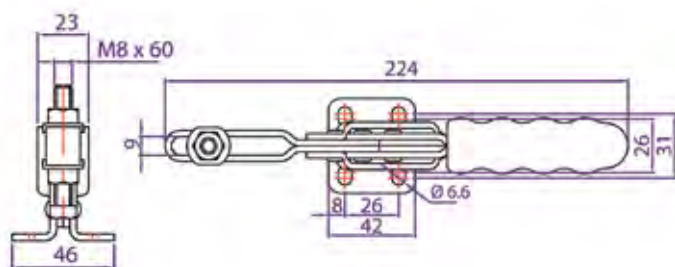


Product Code	Holding Force	Weight	Arm Opening Angle	Handle Opening Angle
H75/2B	75 daN	0.10 kg	90°	75°

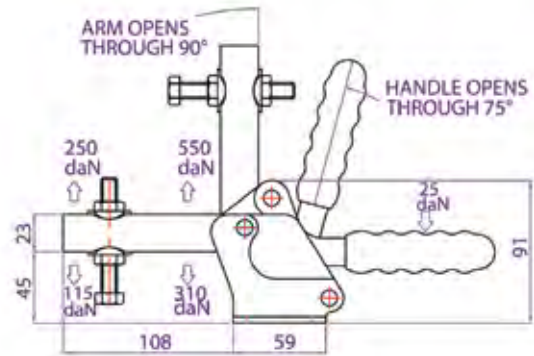
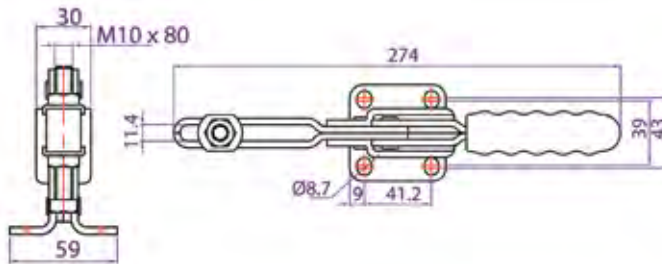


Product Code	Holding Force	Weight	Arm Opening Angle	Handle Opening Angle
H150/2B	150 daN	0.25 kg	90°	80°

Horizontal Toggle Clamp -H250

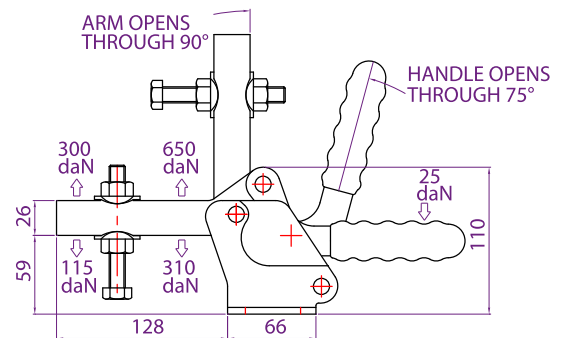
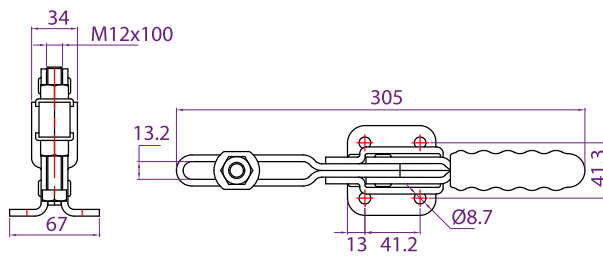


Product Code	Holding Force	Weight	Arm Opening Angle	Handle Opening Angle
H250/2B	250 daN	0.50 kg	95°	80°

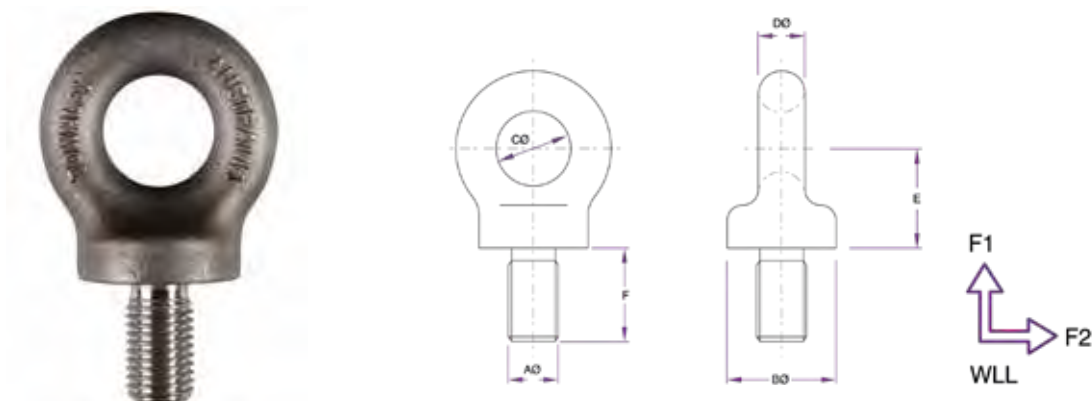


Product Code	Holding Force	Weight	Arm Opening Angle	Handle Opening Angle
H350/2B	350 daN	0.90 kg	90°	75°

Horizontal Toggle Clamp -H450



Product Code	Holding Force	Weight	Arm Opening Angle	Handle Opening Angle
H450/2B	450 daN	1.60 kg	90°	75°



Manufactured using only heat certified Australian Steel

WLL (Working Load Limit)

Each eye bolt is clearly stamped with the permitted F2 WLL.

F2 WLL - indicates safe use for non-axial lifts.

F1 WLL - indicates loads which are in line with the axis of the threaded end of the eye bolt.

F1 WLL allows up to four (4) times higher lifting capacity whilst maintaining a 6:1 design factor of safety

METRIC									
Product Code	AØ	WLL F1 t	WLL F2 t	BØ	CØ	DØ	E	F	Net Weight (kg)
EYE10	M10	0.25t	0.06t	21	14	9	19	17	0.06
EYE12	M12	0.4t	0.1t	28	18	11	24	21	0.15
EYE16	M16	0.8t	0.2t	35	23	14	31	27	0.28
EYE20	M20	1.6t	0.4t	42	30	16	35	38	0.46
EYE24	M24	2.5t	0.62t	57	38	22	48	42	1.10
EYE30	M30	4t	1t	71	49	27	65	52	2.10
EYE36	M36	6.3t	1.57t	87	53	35	73	64	3.70
EYE42	M42	8t	2t	102	66	40	90	76	6.30

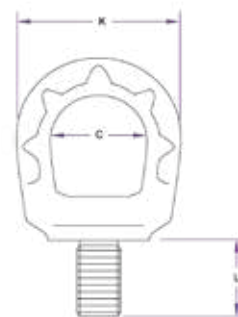
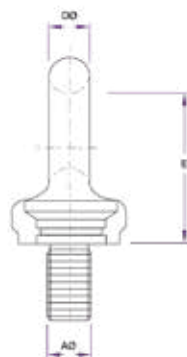
IMPERIAL									
Product Code	AØ	WLL F1 t	WLL F2 t	BØ	CØ	DØ	E	F	Net Weight (kg)
EYE124	3/8"	0.25	0.06	21	14	9	19	17	0.06
EYE132	1/2"	0.4	0.1	28	18	11	24	21	0.15
EYE140	5/8"	0.8	0.2	35	23	14	31	27	0.28
EYE148	3/4"	1.6	0.4	42	30	16	35	38	0.46
EYE156	7/8"	2	0.5	50	32	20	41	41	0.85
EYE164	1"	2.5	0.62	57	38	22	48	42	1.10



- Forged from high tensile tempered alloy steel
- Electromagnetic crack detection to AS1171
- Hi-visibility powder coating to AS4506

WLL (Working Load Limit)

- Each eye bolt is clearly stamped with the permitted F2 WLL.
- F2 WLL - indicates safe use for non-axial lifts.
- F1 WLL - indicates loads which are in line with the axis of the threaded end of the eye bolt.
- F1 WLL allows up to four (4) times higher lifting capacity whilst maintaining a 6:1 design factor of safety
- More sizes available on request

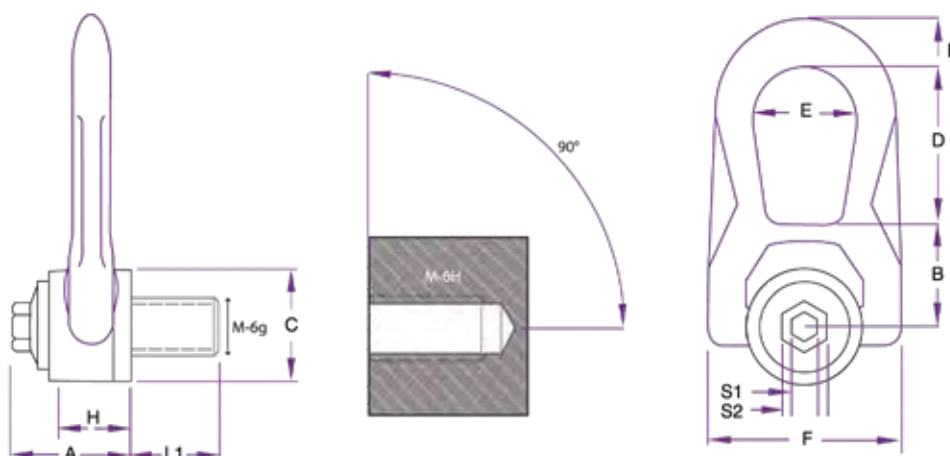


METRIC										
Product Code	Aø	SF 5:1 WLL F1 t	SF 4:1 WLL F2 t	C	D	E	K	L	Torque (Nm)	Net Weight (kg)
EYE10-G10	M10	1t	0.4t	30	11	43	55	15	14	0.23
EYE12-G10	M12	2t	0.75t	30	11	43	55	18	22	0.23
EYE16-G10	M16	4t	1.5t	34	14	49	64	24	60	0.38
EYE20-G10	M20	6t	2.3t	39	16	56	69	30	105	0.60
EYE24-G10	M24	8t	3.2t	50	19	71	86	36	182	1.10



European Quality

- Higher working load limits
- Full double swivel action giving greater flexibility and functionality
- Customisation of thread types and bolt lengths available in Australia
- Easier to use in more applications
- Eliminates the issues of offset loading with other swivel lifting points
- More sizes available on request

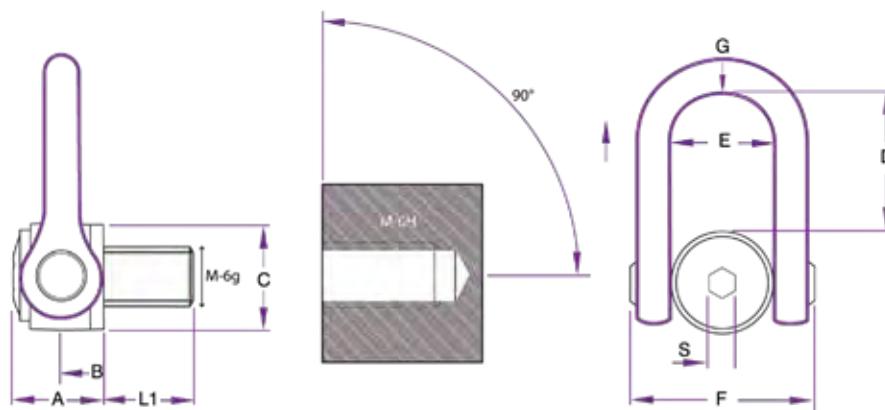


METRIC																
Product Code	Dia. Ø	SF 5:1 WLL F1 t	SF 4:1 WLL F2 t	Standard L1	S1	S2	A	B	C	D	E	F	G	H	Torque (Nm)	Net Weight (kg)
EYE08-DSR	M8 (x1.25)	0.40	0.50	15	8	16	33	30	30	38	27	14	53	9.5	6	0.3
EYE10-DSR	M10 (x1.5)	0.70	0.90	18	8	16	33	30	30	38	27	14	53	9.5	10	0.3
EYE12-DSR	M12 (x1.75)	1.05	1.30	21	8	16	33	30	30	38	27	14	53	9.5	15	0.3
EYE16-DSR	M16 (x2)	2.00	2.30	27	8	20	45	40	45	53	38	17	76	13	50	0.9
EYE20-DSR	M20 (x2.5)	2.50	2.50	30	8	20	45	40	45	53	38	17	76	13	100	0.9
EYE22-DSR	M22 (x2.5)	3.50	4.50	33	14	24	62	55	60	83	55	25	115	19	120	2.6
EYE24-DSR	M24 (x3)	4.40	5.50	36	14	24	62	55	60	83	55	25	115	19	160	2.6
EYE27-DSR	M27 (x3)	5.70	6.00	40	14	24	62	55	60	83	55	25	115	19	200	2.7
EYE30-DSR	M30 (x3.5)	6.00	6.30	45	14	24	62	55	60	83	55	25	115	19	250	2.7



European Quality

- Higher working load limits
- Full double swivel action giving greater flexibility and functionality
- Customisation of thread types and bolt lengths available in Australia
- Easier to use in more applications
- Eliminates the issues of offset loading with other swivel lifting points
- More sizes available on request



METRIC														
Product Code	Dia. Ø	SF 5:1 WLL F1 t	SF 4:1 WLL F2 t	Standard L1	S	A	B	C	D	E	F	G	Torque (Nm)	Net Weight (kg)
EYE33-DSS	M33 (x3.5)	8.50	10.50	50	19	61	31	70	98	73	149	33	250	5.5
EYE36-DSS	M36 (x4)	11.00	12.00	54	19	61	31	70	98	73	149	33	320	5.5
EYE42-DSS	M42 (x4.5)	13.00	15.00	63	19	61	31	70	98	73	149	33	400	5.8
EYE48-DSS	M48 (x5)	17.00	20.00	68	19	79	38	90	123	91	182	45	600	11.0
EYE64-DSS	M64 (x6)	25.00	32.10	90	19	79	38	95	123	91	182	45	600	12.2



Product Code	Description
MIT-500-752-20	Mitutoyo 150/6" Coolant Proof Digital Calliper
MIT-500-753-20	Mitutoyo 200/8" Coolant Proof Digital Calliper
MIT-SR44	Sr44 Replacement Battery

Outside Micrometer



Product Code	Description
MIT-103-137	Mitutoyo 0 - 25mm Outside Micrometer
MIT-103-138	Mitutoyo 25 - 50mm Outside Micrometer

Dial Indicator Kit



Kit includes:

- Lever indicator (513 - 404E)
- Swivel clamp (for dia. 4mm stem, dia. 8mm stem and dovetail mounting)
- Holding Bar (9 x 9 x 100mm)
- Knurled clamp ring nut,
- Stem dia. 4mm and stem dia. 8mm

Product Code	Description
MIT-513-404-10T	Mitutoyo Dial Indicator Kit

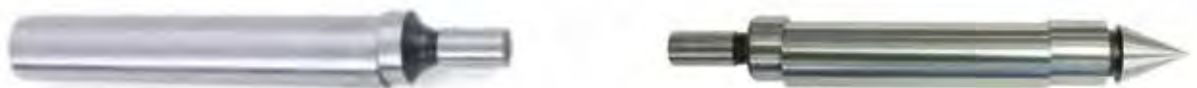


Mitutoyo's Magnetic Stands accept all dial indicators and dial test indicators. Standard or with fine adjustment.

The On-Off switch offers instant mounting and dismounting without any adverse effect to the indicators or work piece surface.

Product Code	Description
MIT-7010S-10	Mitutoyo Magnetic Stand - Plain
MIT-7011S-10	Mitutoyo Magnetic Stand - Fine Adjustment

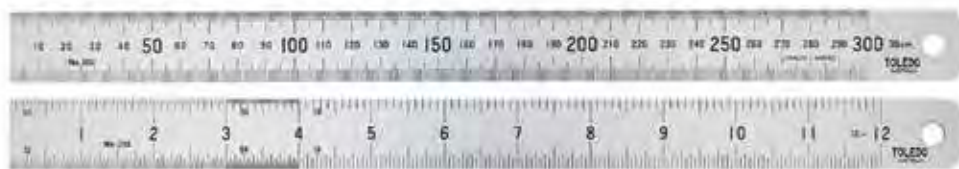
Edge Finder



Used in a milling machine to find the work piece edge; all working surfaces are hardened and ground.

Product Code	Description
MIT-98-321-3	Edge Finder
MIT-98-325-4	Combination Edge & Centre Finder

Toledo Steel Rule



Product Code	Description
T0150	Toledo 150MM / 6" METRIC / IMPERIAL Rule
T0300	Toledo 300MM / 12" METRIC / IMPERIAL Rule
T0600	Toledo 600MM / 24" METRIC / IMPERIAL Rule
T1000	Toledo 1000MM / 36" METRIC / IMPERIAL Rule



Rubber back case

3 rivet end hook

The most consistently accurate, value for money tape measure

Product Code	Description
TAPEMEASURE-8MT	8m Ultimeas measuring tape

Hand Held Refractometer



An industrial fluids testing device that will quickly and accurately measure the concentrate to water ratio of metal working coolants, parts cleaners, chromating solutions and many other types of aqueous based solutions and emulsions.

Product Code	Description
REFRACTOMETER	Hand held refractometer

Work Finisher Ceramic & Throwaway Knives



Small and large Work Finishers offer deburring of hard plastics, without the possibility of cutting your hand.

Product Code	Description
WF620	Small Work Finisher Knife
WF1540	Large Work Finisher Knife
TSK	145mm Long Disposable Fixed Knife Blade



The ultimate for performance and reliability

- Suitable for manual and automatic systems
- Compressor oil suitable for piston-type compressors
- An Australian product made from local and imported products

Product Code	Size
AIRTOOL-OIL-0250	250ml

Bearing Blue



Stuarts Bearing Blue is an oil based paste for indicating high spots on machine bearings & machine tool beds etc.

Product Code	Description
ZBSS	Micrometer Blue 32g tube

Blue Layout Stain



Blue Layout Stain is for marking on hard surfaces such as metal and glass.

The ideal product for tool and die makers, machinists, pattern makers, sheet metal workers and maintenance mechanics.

Product Code	Description
LS1	DY-MARK engineering layout ink - 1 Litre

Designation	Application	up to 3mm	3mm - 6mm	6mm - 10 mm	10mm - 18mm	18mm - 30mm	30mm - 50mm
d9		-20	-30	-40	-50	-65	-80
		-45	-60	-76	-93	-117	-142
f7	Ground Surfaces	-6	-10	-13	-16	-20	-25
		-16	-22	-28	-34	-41	-50
F7	Drill guides-I.D.	+16	+22	+28	+34	+41	+50
		+7	+10	+13	+16	+20	+25
g5		-2	-4	-5	-6	-7	-9
		-6	-9	-11	-14	-16	-20
g6	Ejector Pins	-2	-4	-5	-6	-7	-9
		-8	-12	-14	-17	-20	-25
h4	Guide pins (die sets)	0	0	0	0	0	0
		-3	-4	-4	-5	-6	-7
h5		0	0	0	0	0	0
		-4	-5	-6	-8	-9	-11
h6	Punches D.C. F(pt)	0	0	0	0	0	0
		-6	-8	-9	-11	-13	-16
h7		0	0	0	0	0	0
		-10	-12	-15	-18	-21	-25
h9		0	0	0	0	0	0
		-25	-30	-36	-43	-52	-62
h11		0	0	0	0	0	0
		-60	-75	-90	-110	-210	-250
H5		+4	+5	+6	+8	+9	+11
		0	0	0	0	0	0
H7	Punch guides-I.D. Reamers	+10	+12	+15	+18	+21	+25
		0	0	0	0	0	0
H8	Die inserts or buttons-I.D.(A&B)	+14	+18	+22	+27	+33	+39
		0	0	0	0	0	0
j5		+2	+3	+4	+5	+5	+6
		-2	-2	-2	-3	-4	-5
j6		+4	+6	+7	+8	+9	+11
		-2	-2	-2	-3	-4	-5
j7		+7	+9	+10	+12	+13	+15
		-2	-3	-5	-6	-8	-10
k6	Die inserts O.D(B)	+10	+12	+15	+18		
		+1	+1	+2	+2		
m5		+7	+9	+12	+15	+17	+20
		+2	+4	+6	+7	+8	+9
m6	Punches E,F(shk) Dowels	+9	+12	+15	+18	+21	+25
		+2	+4	+6	+7	+8	+9
n6	Die inserts-O.D.(A) Guide Bushes-O.D.	+13	+16	+19	+23	+28	+32
		+6	+8	+10	+12	+15	+17
p6		+16	+20	+24	+29	+35	+42
		+9	+12	+15	+18	+22	+26
r6		+19	+23	+28	+34	+41	+50
		+12	+15	+19	+23	+28	+34
s5		+18	+24	+29	+36	+44	+54
		+14	+19	+23	+28	+35	+43
s6		+22	+27	+32	+39	+48	+59
		+15	+19	+23	+28	+35	+43



INDUSTRIAL LUBRICANTS

Application	Product	Brand	Page
■ ■ Air Compressor Oil	Aircol	Castrol	374
■ ■ Air Compressor Oil	Corena	Shell	377
■ ■ Anti Rust Fluid	DWS 1	Matrix	381
■ ■ Anti Rust Fluid	Rustilo DWX	Castrol	376
■ ■ Assembly PTFE Paste	Prolon	Hales	392
■ ■ Bearing & Circulating Oil	Morlina	Shell	378
■ ■ Cleaner/Degreaser	Dobotex Gold	Shell	379
■ ■ Gear Oil	Omala-S2GX	Shell	378
■ ■ Gear Oil	Alpha SP, Alphasyn EP	Castrol	374
■ ■ Grease	Spheerol	Castrol	376
■ ■ Grease	Gadus	Shell	377
■ ■ Heat Transfer Oil	Heatmax B	Matrix	382
■ ■ Hydraulic Oil	Tellus-MX,VX	Shell	379
■ ■ Hydraulic Oil	Hyspin-AWS,AWH,ZZ	Castrol	375
■ ■ Hydraulic Oil	AW	Matrix	382
■ ■ Penetrating Spray	WD, X3, CRC 5.56	Matrix,CRC	393
■ ■ Penetrating Fluid	CRC 5.56	CRC	393
■ ■ Quenching Oil	FDX S RV	Matrix	382
■ ■ Slideway Oil	Magna SW	Castrol	376
■ ■ Slideway Oil	Tonna	Shell	378
■ ■ Slideway Oil	Slidemax	Matrix	381
■ ■ Spindle Oil	Velocite	Mobil	379
■ ■ Tapping Fluid	Cut ADE	Matrix	392
■ ■ Tapping Paste	Treflex	CRC	392

FOOD GRADE LUBRICANTS

Application	Product	Brand	Page
■ ■ Anti Seize	Foodmax Assembly Paste	Matrix	388
■ ■ Grease	Foodmax-CAS,Clear,ASP	Matrix	386
■ ■ Clean Wipes	Foodmax Wipes	Matrix	392
■ ■ Chain/Slideway	Foodmax Chain	Matrix	387
■ ■ Corrosion Inhibitor	Liquid Lanolin	Lanotec	385
■ ■ Gear	Foodmax Gear	Matrix	388
■ ■ Hydraulic	Foodmax AW	Matrix	387
■ ■ Lubricating/Cleaning	Foodmax Aerosol Sprays	Matrix	389
■ ■ Stamping Oil	Foodmax 1001	Matrix	387
■ ■ Sugar Dissolver	Foodmax Mummut	Matrix	388
■ ■ White Oil	Foodmax Basic	Matrix	387

METAL WORKING LUBRICANTS

Application	Product	Brand	Page
■ ■ Machine System Cleaner	MTC50	Hales	383
■ ■ Metal Working Coolant-Machining	Hysol MB50	Castrol	374
■ ■ Metal Working Coolant-Machining	Hysol X	Castrol	374
■ ■ Metal Working Coolant-Machining	SOL MB50	Matrix	380
■ ■ Metal Working Coolant-Machining	SOL X	Matrix	380
■ ■ Metal Working Coolant-Machining	AD1500	Hales	383
■ ■ Metal Working Coolant-Grinding	Ultra 990	Hales	383
■ ■ Metal Working Coolant-Grinding	SOL PLUS 144CU	Matrix	380
■ ■ Metal Working Oil - Neat Cutting	CUT 05 MT	Matrix	380
■ ■ Metal Stamping Fluid	Iloform	Castrol	374
■ ■ Metal Stamping Fluid	FDX 1001,FDX 3012	Matrix	381
■ ■ Metal Stamping Fluid	Evap-Lube	Hales	383

INDUSTRIAL SOLVENTS

Application	Product	Brand	Page
■ ■ Solvent	Acetone	Hales	384
■ ■ Solvent	X55	Hales	384
■ ■ Solvent	Kerosene	Hales	384
■ ■ Solvent	Methylated Spirits	Hales	384
■ ■ Solvent	Thinners	Hales	385
■ ■ Solvent	Isopropyl Alcohol	Hales	385
■ ■ EDM Fluid	EDM 5	Hales	385

ACCESSORIES

■ ■ Drum Pump 20 Lt	394
■ ■ Drum Pump 20 Lt - Fits Matrix Pail	394
■ ■ Grease Pump 20 Kg Manual	396
■ ■ Lever Grease Gun 450g	395
■ ■ Lever Pump 60 Lt or 205 Lt	396
■ ■ Lever Shuttle Gun - Food Grade	395
■ ■ Oil Absorbant Clay	394
■ ■ Oil Absorbant Sheets	394
■ ■ Pistol Grease Gun	395
■ ■ Pistol Shuttle Gun - Food Grade	395
■ ■ Plastic Pump 20 Lt - Food Grade	394
■ ■ Rotary Pump	396



Hysol MB50 has been discontinued by Castrol.
See equivalent product Matrix Sol MB50

Hysol X has been discontinued by Castrol.
See equivalent product Matrix Sol X

Metal Stamping Fluid - Iloform

Iloform has been discontinued by Castrol.
See equivalent products Hales Evap-Lube, Matrix FDX 3012 or Matrix FDX 1001HC

Air Compressor Lubricant



Air Compressor Lubricant designed to reduce heat and friction in rotary screw and reciprocating compressors.

- Suitable for hydraulic, air and gas compressors.
- Suitable for small units to large multi-stage configurations

Product Code	Description	Pack Description
CAS-AIRCOLMR46-020	Aircol MR 46	20L Pail
CAS-AIRCOLMR46-205	Aircol MR 46	205L Drum
CAS-AIRCOLMR68-020	Aircol MR 68	20L Pail
CAS-AIRCOLMR68-205	Aircol MR 68	205L Drum
CAS-AIRCOLPD46-020	Aircol PD 46	20L Pail
CAS-AIRCOLPD100-205	Aircol PD 100	205L Drum
CAS-AIRCOLDN100-020	Aircol SN 100	20L Pail
CAS-AIRCOLDN46-020	Aircol SR 46	20L Pail
CAS-AIRCOLDN46-205	Aircol SR 46	205L Drum
CAS-AIRCOLDN68-020	Aircol SR 68	20L Pail
CAS-AIRCOLDN68-205	Aircol SR 68	205L Drum

Gear Oil - Mineral Range - Alpha SP



The Castrol Alpha SP gear oil range of high quality lubricants are based upon highly refined mineral oil, enhanced with an extreme pressure additive technology providing good thermal stability and high load carrying capacity.

Product Code	Description	Pack Description
CAS-ALPSP100-020	Alpha SP 100	20L Pail
CAS-ALPSP100-205	Alpha SP 100	205L Drum
CAS-ALPSP150-020	Alpha SP 150	20L Pail
CAS-ALPSP150-205	Alpha SP 150	205L Drum
CAS-ALPSP220-020	Alpha SP 220	20L Pail
CAS-ALPSP220-205	Alpha SP 220	205L Drum
CAS-ALPSP320-020	Alpha SP 320	20L Pail
CAS-ALPSP320-205	Alpha SP 320	205L Drum
CAS-ALPSP460-020	Alpha SP 460	20L Pail
CAS-ALPSP460-205	Alpha SP 460	205L Drum
CAS-ALPSP680-020	Alpha SP 680	20L Pail
CAS-ALPSP680-205	Alpha SP 680	205L Drum



Castrol Hyspin is a range of high quality mineral oils with a viscosity index improver.

- For modern hydraulic equipment operating under severe service conditions
- Wide temperature range and high pressure
- Suitable for injection moulders, earthmoving hydraulic systems, machine tools, agriculture equipment

Product Code	Description	Pack Description
CAS-HYSAWS010-020	Hyspin AWS 10	20L Pail
CAS-HYSAWS010-205	Hyspin AWS 10	205L Drum
CAS-HYSAWS022-020	Hyspin AWS 22	20L Pail
CAS-HYSAWS022-205	Hyspin AWS 22	205L Drum
CAS-HYSAWS032-020	Hyspin AWS 32	20L Pail
CAS-HYSAWS032-205	Hyspin AWS 32	205L Drum
CAS-HYSAWS046-020	Hyspin AWS 46	20L Pail
CAS-HYSAWS046-205	Hyspin AWS 46	205L Drum
CAS-HYSAWS046-1000	Hyspin AWS 46	1000L IBC
CAS-HYSAWS068-020	Hyspin AWS 68	20L Pail
CAS-HYSAWS068-205	Hyspin AWS 68	205L Drum
CAS-HYSAWS068-1000	Hyspin AWS 68	1000 IBC
CAS-HYSAWS100-020	Hyspin AWS 100	20L Pail
CAS-HYSAWS100-205	Hyspin AWS 100	205L Drum
CAS-HYSAWS150-020	Hyspin AWS 150	20L Pail
CAS-HYSAWS150-205	Hyspin AWS 150	205L Drum
CAS-HYSAWS220-020	Hyspin AWS 220	20L Pail
CAS-HYSAWS220-205	Hyspin AWS 220	205L Drum

Hydraulic Oil - Hyspin AWH & ZZ



The Castrol Hyspin AWH hydraulic oil with Viscosity Index improver (VI) range is based upon highly refined mineral oil enhanced with a stabilised zinc additive system.

Product Code	Description	Pack Description
CAS-HYSAWH015-020	Hyspin AWH 15	20L Pail
CAS-HYSAWH032-020	Hyspin AWH 32	20L Pail
CAS-HYSAWH046-020	Hyspin AWH 46	20L Pail
CAS-HYSAWH046-205	Hyspin AWH 46	205L Drum
CAS-HYSAWH068-020	Hyspin AWH 68	20L Pail
CAS-HYSAWH068-205	Hyspin AWH 68	205L Drum
CAS-HYSAWH100-020	Hyspin AWH 100	20L Pail

The Castrol Hyspin ZZ hydraulic oil range of lubricants are based on a carefully selected ashless (zinc free) additive system designed to meet and exceed the most exacting performance standards.

Product Code	Description	Pack Description
CAS-HYSZZ032-020ZF	Hyspin ZZ 32	20L Pail
CAS-HYSZZ032-205ZF	Hyspin ZZ 32	205L Drum
CAS-HYSZZ046-020ZF	Hyspin ZZ 46	20L Pail
CAS-HYSZZ046-205ZF	Hyspin ZZ 46	205L Drum
CAS-HYSZZ046-1000ZF	Hyspin ZZ 46	1000L IBC
CAS-HYSZZ068-020ZF	Hyspin ZZ 68	20L Pail
CAS-HYSZZ068-205ZF	Hyspin ZZ 68	205L Drum
CAS-HYSZZ068-1000ZF	Hyspin ZZ 68	1000L IBC
CAS-HYSZZ150-020ZF	Hyspin ZZ 150	20L Pail
CAS-HYSZZ150-205ZF	Hyspin ZZ 150	205L Drum



The Castrol Magnaglide family of oils are high performance, demulsifying, slideway lubricants based on solvent refined mineral oil. These contain very efficient lubricity and extreme pressure additives for effective control of machine tool sliding surfaces.

Product Code	Description	Pack Description
CAS-MAGNASW32-020	Magna SW 32	20L Pail
CAS-MAGNASWD68-020	Magna SW D68	20L Pail
CAS-MAGNASWD68-205	Magna SW D68	205L Drum
CAS-MAGNASWD220-020	Magna SW D220	20L Pail
CAS-MAGNASWD220-205	Magna SW D220	205L Drum

Grease - Spheerol



Castrol Spheerol is a range of greases which comprises lithium based products, containing highly refined mineral oils, fortified with extreme pressure (EP) additives as well as corrosion and oxidation inhibitors.

Product Code	Description	Pack Description
CAS-SPHEEROLEPL0-0025	Spheerol EPL 0	2.5kg Tub
CAS-SPHEEROLEPL0-020	Spheerol EPL 0	20kg Pail
CAS-SPHEEROLEPL0-175	Spheerol EPL 0	175kg Drum
CAS-SPHEEROLEPL00-020	Spheerol EPL 00	20kg Pail
CAS-SPHEEROLEPL00-175	Spheerol EPL 00	175kg Drum
CAS-SPHEEROLEPL1-020	Spheerol EPL 1	20kg Pail
CAS-SPHEEROLEPL1-180	Spheerol EPL 1	180kg Drum
CAS-SPHEEROLEPL2-0045	Spheerol EPL 2	450g Cartridge
CAS-SPHEEROLEPL2-002.5	Spheerol EPL 2	2.5kg Tub
CAS-SPHEEROLEPL2-020	Spheerol EPL 2	20kg Pail
CAS-SPHEEROLEPL2-055	Spheerol EPL 2	55kg Pail
CAS-SPHEEROLEPL2-180	Spheerol EPL 2	180kg Drum
CAS-SPHEEROLEPLX200-2 045	Spheerol EPLX	450g Cartridge
CAS-SPHEEROLEPLX200-2 020	Spheerol EPLX	20kg Pail
CAS-SPHEEROLHTB2-0045	Spheerol HTB2	450g Cartridge
CAS-SPHEEROLHTB2 020	Spheerol HTB2	20kg Pail
CAS-SPHEEROLLMM-0045	Spheerol LMM	450g Cartridge
CAS-SPHEEROLLMM-002.5	Spheerol LMM	2.5kg Tub
CAS-SPHEEROLLMM 020	Spheerol LMM	20kg Pail
CAS-SPHEEROLSBX2-0045	Spheerol SBX2	450g Cartridge
CAS-SPHEEROLSBX2-020	Spheerol SBX2	20kg Pail
CAS-SPHEEROLULTRATAK-0045	Spheerol Ultratak 2	450g Cartridge
CAS-SPHEEROLULRATAK2-020	Spheerol Ultratak 2	20kg Pail

Corrosion Preventative - Rustilo DWX



Rustilo DWX has been discontinued by Castrol.
See equivalent product Matrix Antirust 1 DWS



The Shell Corena range of air compressor oils has been developed to deliver value to your operations through enhanced wear protection, long oil life and high system efficiency.

Product Code	Description	Pack Description
SHEL-COR S2P068 20	Corena S2 P68	20L Pail
SHEL-COR S2P100 20	Corena S2 P100	20L Pail
SHEL-COR S2P150 20	Corena S2 P150	20L Pail
SHEL-COR S3R46 20	Corena S3 R46	20L Pail
SHEL-COR S3R46 209	Corena S3 R46	209L Drum
SHEL-COR S3R68 20	Corena S3 R68	20L Pail
SHEL-COR S4R46 20	Corena S4 R46	20L Pail

Multi Purpose Grease - Gadus



Shell Gadus is a comprehensive family of greases, that includes multi-purpose greases that can help to simplify your product inventory, as well as specific greases, including advanced poly urea synthetic products designed for the most severe extreme-temperature and long-life applications, and a range of open-gear lubricants.

Product Code	Description	Pack Description
SHEL-GAD RAILS2-018	Gadus Rail S Traction Motor	18kg Pail
SHEL-GAD S2 V100 2 .450	Gadus S2 V100 2	450g Cartridge
SHEL-GAD S2 V100 2 18	Gadus S2 V100 2	18kg Pail
SHEL-GAD S2 V100 2 180	Gadus S2 V100 2	180kg Drum
SHEL-GAD S2 V100 3 .450	Gadus S2 V100 3	450g Cartridge
SHEL-GAD S2 V100 3 18	Gadus S2 V100 3	18kg Pail
SHEL-GAD S2 V100 3 180	Gadus S2 V100 3	180kg Drum
SHEL-GAD S2 V220 00 18	Gadus S2 V220 00	18kg Pail
SHEL-GAD S2 V220 0 18	Gadus S2 V220 0	18kg Pail
SHEL-GAD S2 V220 1 18	Gadus S2 V220 1	18kg Pail
SHEL-GAD S2 V220 2 .450	Gadus S2 V220 2	450g Cartridge
SHEL-GAD S2 V220 2 18	Gadus S2 V220 2	18kg Pail
SHEL-GAD S2 V220 2 180	Gadus S2 V220 2	180kg Drum
SHEL-GAD S2 V220 AC2 .450	Gadus S2 V220 AC2	450g Cartridge
SHEL-GAD S2 V220 AC2 18	Gadus S2 V220 AC2	18kg Pail
SHEL-GAD S2 V220 AC2 180	Gadus S2 V220 AC2	180kg Drum
SHEL-GAD S2 V220 AD 18	Gadus S2 V220 AD2	18kg Pail
SHEL-GAD S2 V220 AD2 .450	Gadus S2 V220 AD2	450g Cartridge
SHEL-GAD S2 V1000 AD1.5	Gadus S2 V1000 AD1.5	18kg Pail
SHEL-GAD S2 V1000 AD2.450	Gadus S2 V1000 AD2	450g Cartridge
SHEL-GAD S3 T100 2 .450	Gadus S3 T100 2	450g Cartridge
SHEL-GAD S3 T100 2 18	Gadus S3 T100 2	18kg Pail
SHEL-GAD S3 T220 2 .450	Gadus S3 T220 2	450g Cartridge
SHEL-GAD S3 V220 C .450	Gadus S3 V220 C2	450g Cartridge
SHEL-GAD S3 V220 C2 18	Gadus S3 V220 C2	18kg Pail
SHEL-GAD S3 V220 C2 180	Gadus S3 V220 C2	180kg Drum
SHEL-GAD S3 V4608-018	Gadus S3 V460 2	18kg Pail
SHEL-GAD S5 T460 1.5 180	Gadus S5 T460 1.5	180kg Drum



Consistent and reliable lubrication, whatever the operating conditions, is key to meet the challenges of a wide range of equipment designs and applications. Shell Morlina offers a portfolio of oils that enables you to choose a product to help match your technical and operational needs.

Product Code	Description	Pack Description
SHEL-MOR S2 BL10 20	Morlina S2 BL10	20L Pail
SHEL-MOR S2 BL10 209	Morlina S2 BL10	209L Drum
SHEL-MOR S2 B150 20	Morlina S2 B150	20L Pail
SHEL-MOR S2 B150 209	Morlina S2 B150	209L Drum
SHEL-MOR S2 B220 020	Morlina S2 B220	20L Pail

Industrial Gear Oil - Omala



The Shell Omala range of industrial gear oils helps you to match oil life to your operational needs. Advanced synthetic oils such as Shell Omala S4WE can offer additional benefits by providing improved energy efficiency compared with conventional oils.

Product Code	Description	Pack Description
SHEL-OMA S2 G 068 20	Omala S2 GX 68	20L Pail
SHEL-OMA S2 G 068 209	Omala S2 GX 68	209L Drum
SHEL-OMA S2 G 150 20	Omala S2 GX 150	20L Pail
SHEL-OMA S2 G 220 20	Omala S2 GX 220	20L Pail
SHEL-OMA S2 G 220 209	Omala S2 GX 220	209L Drum
SHEL-OMA S2 G 320 20	Omala S2 GX 320	20L Pail
SHEL-OMA S2 G 320 209	Omala S2 GX 320	209L Drum
SHEL-OMA S2 G 460 20	Omala S2 GX 460	20L Pail
SHEL-OMA S2 G 460 209	Omala S2 GX 460	209L Drum
SHEL-OMA S2 G 680 20	Omala S2 GXV 680	20L Pail
SHEL-OMA S2 G 680 209	Omala S2 GXV 680	209L Drum

Premium Slideway Oil - Tonna



Shell's Tonna Range is especially designed to lubricate machine tool slides, table stand feed mechanisms. With excellent frictional properties, very good slideway adhesion and excellent anti-wear performance, it can be relied on to help provide efficient machining accuracy and reliable protection for your equipment.

Product Code	Description	Pack Description
SHEL-TONS68 20	Tonna S3 M68	20L Pail
SHEL-TONS68 209	Tonna S3 M68	209L Drum
SHEL-TONS220 20	Tonna S3 M220	20L Pail



Shell Tellus fluids are high performance hydraulic fluids that use Shell's unique patented technology to provide outstanding protection and performance in most manufacturing and many mobile equipment operations.

Product Code	Description	Pack Description
SHEL-TELLMX22 20	Tellus S2 MX22	20L Pail
SHEL-TELLMX22 209	Tellus S2 MX22	209L Drum
SHEL-TELLMX32 20	Tellus S2 MX32	20L Pail
SHEL-TELLMX32 209	Tellus S2 MX32	209L Drum
SHEL-TELLMX46 20	Tellus S2 MX46	20L Pail
SHEL-TELLMX46 209	Tellus S2 MX46	209L Drum
SHEL-TELLMX46 1000	Tellus S2 MX46	1000L IBC
SHEL-TELLMX68 20	Tellus S2 MX68	20L Pail
SHEL-TELLMX68 209	Tellus S2 MX68	209L Drum
SHEL-TELLMX100 20	Tellus S2 MX100	20L Pail
SHEL-TELLMX100 209	Tellus S2 MX100	209L Drum
SHEL-TELLS2VX46 20	Tellus S2 VX46	20L Pail
SHEL-TELLS2VX46 209	Tellus S2 VX46	209L Drum
SHEL-TELLS2VX68 20	Tellus S2 VX68	20L Pail
SHEL-TELLS2VX68 209	Tellus S2 VX68	209L Drum
SHEL-TELLS3M46 209 ZF	Tellus S3 M46	209L Drum
SHEL-TELLS3M46 1000 ZF	Tellus S3 M46	1000L IBC
SHEL-TELLS3M68 209 ZF	Tellus S3 M68	209L Drum

Cleaning Solution - Dobotex Gold



Water based multi-purpose cleaning solution for truck, car and marine applications and heavy duty mining equipment.

Product Code	Description	Pack Description
SHEL-DOB AQUA 020	Dobotex Aqua Degreaser	20L Pail
SHEL-DOB G 20	Dobotex Gold	20L Pail
SHEL-DOB G 200	Dobotex Gold	200L Drum
SHEL-DOB PLAT 020	Dobotex Platinum	20L Pail

Spindle Oil - Velocite No. 3

MOBIL


Mobil Velocite™ 3 is a premium performance oil, primarily designed for the lubrication of high speed spindles in machine tools. Can also be used in some critical hydraulic, circulation systems and air line oilers where the appropriate viscosity grade is selected.

Formulated from select high quality, low viscosity base oils, they possess very good resistance to foaming and separate readily from water.

Product Code	Description	Pack Description
MOB-VELOCITE 3-020	Mobil Velocite 3	20L Pail



Sol-MB 50 is especially designed for machining of ferrous and aluminium alloys.

- High Performance soluble metalworking fluid
- Unique additives that enhance machining performance and surface finish
- Chlorine and Formaldehyde releasing agent free
- Improves bio-resistance properties - lowers overall operations cost
- Suitable for large central systems and single pump machines

NOTE: Not recommended for use with yellow metals.

Product Code	Description	Pack Description
MAT-SOLMB50-020	SOL MB50	20 Lt Pail
MAT-SOLMB50-200	SOL MB50	200 Lt Drum

Metalworking Fluid - Soluble High Performance



Sol-X is especially designed for heavy duty machining of ferrous and non-ferrous metals.

- High Performance soluble metalworking fluid
- Unique additives that enhances machining performance and surface finish
- Chlorine free
- Suitable for large central systems
- Suitable for single pump machines

Product Code	Description	Pack Description
MAT-SOLX-020	SOL-X	20 Lt Pail

Machining Neat Cutting Oil Cut 05 MT



Cut 05 MT is a universal cutting fluid formulated from judiciously selected components.

The balanced additives maximize performance over a wide range of pressures and temperatures seen when machining difficult metals and difficult conditions. Cut 05 MT has high chemical stability, good cooling properties and minimum tendency to form oil mist. It is recommended for machining of all metals, with excellent performance under heavy operation conditions.

Product Code	Description	Pack Description
MAT-CUT05MT-020	Cutting Oil CUT 05 MT	20 Lt Pail

Grinding Fluid - Premium - Sol Plus 144 CU



A synthetic coolant, based upon the formulation of selected chemicals in solution which provides an oily grinding fluid totally formaldehyde free.

It is a transparent fluid suitable for all types of grinding applications and for the less arduous machining operations of steel, cast iron and copper.

The product is formulated from selected materials which will not support sump bacteria.

It will not foam or split even under the most turbulent conditions; the product totally rejects tramp oil making it ideal choice as grinding fluid.

The swarf settling and excellent corrosion properties of the product ensure that many months trouble free sump life can be achieved with a single charge of coolant.

Product Code	Description	Pack Description
MAT-SOLPLUS144CU-020	Grinding Fluid Sol Plus 144 CU	20 Lt Pail



Slidemax are specially compounded oils developed for the lubrication for slides and ways. They are specially developed to eliminate the phenomenon of stick-slip in machine tool operation. The combination of compounding, special base oils and additives gives Slidemax outstanding stability, extreme oiliness, adhesiveness and exceptional load carrying ability.

Product Code	Description	Pack Description
MAT-SLIDEMAX 68 20	Slidemax 68	20 Lt Pail
MAT-SLIDEMAX 68 205	Slidemax 68	205 Lt Drum

Anti Rust - DWS 1



This product is a fluid that contains solvents, rust inhibitors and water hydrophobic additives. These displace moisture and water from parts by leaving a greasy-oily film with good anti-rust properties, providing up to 18 months indoor protection. In general, this product is applied to those parts that need protection and have been machined with soluble oils. Other applications include protection of parts which have been quenched with water before being packed, or parts of machinery subjected to corrosive moistures.

Product Code	Description	Pack Description
MAT-ANTIRUST1 -020	Anti Rust DWS	20 Lt Pail

Stamping Oil - Light Evaporative - FDX 1001



FDX 1001 is a series of low viscosity evaporating oil specially formulated for stamping and forming applications. Its polar compounds assures most effective operations. The main advantage of FDX 1001 is that parts do not need to be degreased thanks to the forming of very little residue.

Product Code	Description	Pack Description
MAT-FDX-1001-020	Stamping Oil FDX 1001	20 Lt Pail
MAT-FDX-1001--200	Stamping Oil FDX 1001	200 Lt Drum

Drawing Oil - Heavy Duty Neat - FDX 3012



FDX 3012 is an oil with EP properties specially formulated for metal stamping, sheet cutting and drawing applications. The combination of EP additives, lubricity and polar compounds make it specially suitable for obtaining very high efficiency. FDX 3012 is suitable for cold drawing of all kind of metals including steel, stainless steel, brass, bronze and aluminium and for drawing of automotive components.

- Extended die life
- Reduced pick-up and scoring
- High film strength
- Excellent surface finish
- Easy to apply

Product Code	Description	Pack Description
MAT-FDX 3012-020	FDX 3012	20 Lt Pail
MAT-FDX 3012-205L	FDX 3012	205 Lt Drum



High performance hydraulic fluid, based on the latest base oil and additive technology. The use of an ashless additive pack warrants optimal performance and a long service life

Product Code	Description	Pack Description
MAT-HYDROMAX AW32 20	Hydromax AW32	20 Lt Pail
MAT-HYDROMAX AW32 205	Hydromax AW32	205 Lt Drum
MAT-HYDROMAX AW46 20	Hydromax AW46	20 Lt Pail
MAT-HYDROMAX AW46 205	Hydromax AW46	205 Lt Drum
MAT-HYDROMAX AW46 1000	Hydromax AW46	1000 Lt IBC
MAT-HYDROMAX AW68 20	Hydromax AW68	20 Lt Pail
MAT-HYDROMAX AW68 205	Hydromax AW68	205 Lt Drum
MAT-HYDROMAX AW68 1000	Hydromax AW68	1000 Lt IBC
MAT-HYDROMAX ZF 46 205	Hydromax ZF46	205 Lt Drum
MAT-HYDROMAX ZF 68 205	Hydromax ZF68	205 Lt Drum

ZF = Zinc Free

Quenching Fluid - FDX S3 RV



FDX S RV fluids have been developed for heat treatment of ferrous metals in a wide variety of quenching operations. The fluid is formulated with carefully selected additives to achieve enhanced oxidation resistance and faster cooling

Product Code	Description	Pack Description
MAT-FDXS3-RV-020	Quenching Fluid FDX S3 RV	20 Lt Pail
MAT-FDXS3-RV--200	Quenching Fluid FDX S3 RV	200 Lt Drum

Heat Transfer Oil - Heatmax B



Heatmax B is a high performance heat transfer oil recommended for most installations. It meets the requested qualities for diathermic fluids: Thermal stability, Chemical stability, Low vapour tension, Fully neutral towards metals, Non toxic

Product Code	Description	Pack Description
MAT-HEATMAX B-020	Heat Transfer Oil	20 Lt Pail



Hales AD1500 is a high performance semi synthetic metalworking coolant designed for the machining of aluminium, steel, copper and brass. It has been formulated for use in soft water as well as hard water, and exhibits low foam and excellent stability under a wide range of conditions. Hales AD1500 offers excellent surface finish and extended tool life, even in difficult operations. Excellent corrosion protection, non-staining to ferrous materials and to aluminium and alloys.

Product Code	Description	Pack Description
HALESAD1500-020	Hales AD 1500	20L Pail
HALESAD1500-200	Hales AD 1500	200L Drum

Metal Working & Grinding Fluid - Hales Ultra 990 Synthetic



Hales Ultra 990 is a chlorine and nitrite free, synthetic coolant, specially designed for light to medium duty cutting and grinding of ferrous and non-ferrous metals. It offers improved performance in applications where conventional synthetic coolants are often used, providing enhanced grinding performance, excellent cleanliness, and providing the machining performance to extend its use to most grinding and general machining operations, on cast iron and low to medium tensile steels, aluminium alloys and copper alloys.

Product Code	Description	Pack Description
HALESULTRA-20	Hales Ultra 990	20L Pail
HALESULTRA-200	Hales Ultra 990	200L Drum

System Cleaner - Hales MTC50



Hales MTC50 is specially formulated to deal with the range of contaminants in machine tool systems, using water based coolants. Regular use of MTC50 at fluid changeover time is highly recommended, as the adoption of the simple clean out procedure dramatically reduces coolant related problems, and ensures maximum coolant life. MTC 50 is easy to use, with minimum disruption to production, being added direct to the coolant system whilst still in operation.

Product Code	Description	Pack Description
HALESMTCS0 05	Machine/System Cleaner	5L Pail
HALESMTCS0 20	Machine/System Cleaner	20L Pail

Evaporating Stamping Fluid - Hales Evap-Lube



Hales Evap-Lube is a low viscosity evaporative stamping fluid. Its prompt evaporation characteristics result in the manufacture of clean components which will accept welds, allow for adhesion of paint to processed parts and leave virtually no residue to react with other processing chemicals. Applications: Suitable for light duty blanking, stamping, shallow drawing and forming, is a non-corrosive and non-staining to aluminium, copper, steel and their alloys. Suitable materials: aluminium, mild steel, brass, galvanised sheet, copper and painted stock.

Product Code	Description	Pack Description
HALESEVAPLUBE 20	Evaporating Stamping Fluid	20L Pail
HALESEVAPLUBE 200	Evaporating Stamping Fluid	200L Drum



Excellent for the removal of glues and for use as a surface cleaner prior to application of sealant. Acetone can be used for cleaning brushes used in fibreglass resin, varnish and lacquer and as a cleaning agent.

Product Code	Description	Pack Description
HALESACETONE-20	Hales Acetone	20L Pail

Solvent - Hales X55



X55 Solvent is a wide boiling range, rapidly evaporating solvent. It can be used in formulation requiring 'speed of evaporation' and combines well with organic compounds. It also delivers a high solvency of greases and oils.

Product Code	Description	Pack Description
HAESLITEX55-20	Hales Shellite X55 Solvent	20L Pail
HAESLITEX55-200	Hales Shellite X55 Solvent	200L Drum

Solvent - Hales Kerosene



Kerosene is a light, oily liquid obtained during the distilling of crude oil and is commonly used as heater fuel and degreaser.

Product Code	Description	Pack Description
HALESKERO-20	Hales Kerosene	20L Pail
HALESKERO-200	Hales Kerosene	200L Drum

Solvent - Hales Methylated Spirits



Methylated Spirits is a very versatile cleaning agent commonly used as a heavy-duty disinfectant, hard surface cleaner or solvent. It is also a great stain remover for removing ink from non-porous surfaces.

Product Code	Description	Pack Description
HALESMETHO-20	Hales Methylated Spirits	20L Pail



Solvent thinner for automotive paints or as a surface cleaner prior to application of paint. Can be used as a cleaning agent for brushes or to remove oil based products from surfaces.

Product Code	Description	Pack Description
HALESTHINNERS-20	General Purpose Thinners	20L Pail

Solvent - Hales Isopropyl Alcohol



Isopropyl Alcohol is a colourless flammable liquid with a strong odour used in a wide range of industrial and household chemicals.

Product Code	Description	Pack Description
HALESISOPROPYL-20	Isopropyl Alcohol	20L Pail

EDM Fluid - Hales EDM 5



EDM5 is a clear, low viscosity di-electric fluid with a high flash point, which reduces the fire hazard. It is free of carcinogenic materials, has no unpleasant odour and due to its low viscosity and surface tension, has minimal drag out.

Product Code	Description	Pack Description
HALESEDMS-20	Hales EDM Fluid	20L Pail
HALESEDMS-200	Hales Kerosene	200L Drum

Liquid Lanolin - Food Grade



A multi-purpose penetrant, lubricant and corrosion inhibitor. Available in General Purpose and Heavy Duty.

Product Code	Description	Pack Description
LANO-GENERALPURPOSE750	Lano GP Liquid	750ml Spray
LANO-GENERALPURPOSE5L	Lano GP Liquid	5 Litre
LANO-GENERALPURPOSE20L	Lano GP Liquid	20 Litre
LANO-GENERALPURPOSE400	Lano GP Liquid	400gm Aero
LANO-HEAVYDUTY750	Lano HD Liquid	750ml Spray
LANO-HEAVYDUTY5L	Lano HD Liquid	5 Litre
LANO-HEAVYDUTY20L	Lano HD Liquid	20 Litre
LANO-HEAVYDUTY400	Lano HD Liquid	400gm Aero

LANOTEC FOOD GRADE LANOLIN



New generation of technically advanced food grade grease developed by complexing modified over based calcium sulphonates. The new technology offers superior mechanical stability, high temperature, high load carrying performance, reduced wear and excellent resistance to water, steam and corrosion.

Product Code	Description	Pack Description
FM-GREASECASS00HS-18	Foodmax Grease CAS S 00 HS	18kg Pail
FM-GREASECASS1LS-040	Foodmax Grease CAS S1 LS	400g Cartridge
FM-GREASECASS1LS-18	Foodmax Grease CAS S1 LS	18kg Pail
FM-GREASECASS2HS-040	Foodmax Grease CAS S2 HS	400g Cartridge
FM-GREASECASS2HS-040SL	Foodmax Grease CAS S2 HS	400g Shuttle
FM-GREASECASS2HS-18	Foodmax Grease CAS S2 HS	18kg Pail
FM-GREASECASS2LS-040	Foodmax Grease CAS S2 LS	400g Cartridge
FM-GREASECASS2LS-18	Foodmax Grease CAS S2 LS	18kg Pail
FM-GREASECASS2LS-E120	Foodmax Pulsar Lube	120ml Dispenser

Clear Grease - Foodmax® Clear



Food grade lubricating grease suitable for the lubrication of a wide range of applications including plain and rolling element bearings in the slaughter houses, canning and bottle factories or any other food processing plants. Works well in the lubrication of plastic components and O-rings.

Product Code	Description	Pack Description
FM-CLEAR2GREASELS-040SL	Foodmax Clear 2 Grease	400g Shuttle
FM-CLEAR2GREASELS-050	Foodmax Clear 2 Grease	500g Tub

White Grease - Foodmax® ASP



Foodmax Grease ASP 2 is an aluminium complex grease designed for the lubrication of almost any type of application which requires a food grade lubricant. Superior resistance to water, is very suitable for the lubrication of chains operated in very wet conditions such as food conveyor chains.

Product Code	Description	Pack Description
FM-GREASEASP2-040	Foodmax Grease ASP 2	400g Cartridge
FM-GREASEASP2-018	Foodmax Grease ASP 2	18kg Pail



- Formulated using specially selected, highly refined base stock in combination with the latest additive technology
- Excellent anti wear properties
- Use for both power and motion transfer in machinery operated close to food production

Product Code	Description	Pack Description
FM-AWHYDRA22-020	Foodmax AW Hydra 22	20L Pail
FM-AWHYDRA46-020	Foodmax AW Hydra 46	20L Pail
FM-AWHYDRA46-210	Foodmax AW Hydra 46	210L Drum
FM-AWHYDRA68-020	Foodmax AW Hydra 68	20L Pail
FM-AWHYDRA68-210	Foodmax AW Hydra 68	210L Drum
FM-AWHYDRAPAO32-20	Foodmax AW PAO Hydra 32	20L Pail
FM-AWHYDRAPAO46-20	Foodmax AW PAO Hydra 46	20L Pail
FM-AWHYDRAPAO68-20	Foodmax AW PAO Hydra 68	20L Pail

White Oil - Foodmax® Basic



- Can be used in the authorised industrial operations whenever there is the possibility of food contact.
- Performs well as dough divider oil
- Lubricant for cutters, knives, conveyors and rollers in packaging equipments.
- Suitable for use as an anti-corrosive for food processing machines

Product Code	Description	Pack Description
FM-BASIC015-020	Foodmax Basic 15	20L Pail
FM-BASIC032-020	Foodmax Basic 32	20L Pail

Chain/Slide Way Oil - Foodmax® Chain



- Adhesive fluids for the lubrication of drive chains, conveyor chains and slide ways
- Fully synthetic • Special additives extend re-lubrication intervals significantly
- Non-drip, no fling characteristics

Product Code	Description	Pack Description
FM-CHAIN068-020	Foodmax Chain 68	20L Pail
FM-CHAIN068-210	Foodmax Chain 68	210L Drum
FM-CHAIN150-020	Foodmax Chain 150	20L Pail
FM-CHAIN220-020	Foodmax Chain 220	20L Pail
FM-CHAIN220-210	Foodmax Chain 220	210L Drum
FM-CHAINHTX-020	Foodmax Chain HT-X	20L Pail

Stamping Oil - Foodmax® 1001 HE



Foodmax 1001 HE is a low viscosity evaporate oil formulated for stamping and forming applications. It contains special polar compounds for more effective operation. Correct use of Foodmax 1001 HE results in low residues leading to less costs for cleaning and degreasing of parts after the process. In its given form Foodmax 1001 HE can also be used as food grade evaporative cleaner and degreaser.

Product Code	Description	Pack Description
FM-1001HE-020	Foodmax Stamping Oil	20 Lt Pail



- Using the latest base stock technology together with a special additive package
- High performance food grade gear oil
- Also available in PAO and PAG synthetic

Product Code	Description	Pack Description
FM-GEAR220-020	Foodmax Gear 220	20L Pail
FM-GEAR320-020	Foodmax Gear 320	20L Pail
FM-GEAR460-020	Foodmax Gear 460	20L Pail
FM-GEAR680-020	Foodmax Gear 680	20L Pail
FM-GEARPAG150-020	Foodmax Gear PAG 150	20L Pail
FM-GEARPAG220-020	Foodmax Gear PAG 220	20L Pail
FM-GEARPAG320-020	Foodmax Gear PAG 320	20L Pail
FM-GEARPAG460-020	Foodmax Gear PAG 460	20L Pail
FM-GEARPAG680-020	Foodmax Gear PAG 680	20L Pail
FM-GEARPAO100-020	Foodmax Gear PAO 100	20L Pail
FM-GEARPAO150-020	Foodmax Gear PAO 150	20L Pail
FM-GEARPAO220-020	Foodmax Gear PAO 220	20L Pail
FM-GEARPAO320-020	Foodmax Gear PAO 320	20L Pail
FM-GEARPAO460-020	Foodmax Gear PAO 460	20L Pail
FM-GEARPAO680-020	Foodmax Gear PAO 680	20L Pail

Sugar Dissolving Chain Lubricant - Foodmax® Mammut



- Food safe lubricant specially developed for use on chains, sliding surfaces and moulds where build up of sugar is seen and eventually causes problems.
- Cleans, removes sugar build up
- Lubricates and prevents from corrosion and new sugar accumulation

Product Code	Description	Pack Description
FM-MAMMUT25-020	Foodmax Mammut 25	20L Pail

Anti-Seize - Foodmax® Assembly Paste



- White, non-toxic, grease like compound
- Designed for use as an assembly lubricant for lubricating bushes, sliding surfaces and small open plastic or metal gears and anti-seize compound for threaded fasteners.
- To prevent damage during start up and protect against premature wear during the running-in period

Product Code	Description	Pack Description
FM-ASSEMBLYPASTE-0125	Foodmax Assembly Paste	125gm Tube
FM-ASSEMBLYPASTE-003	Foodmax Assembly Paste	3kg Tub
FM-ASSEMBLYPASTE - 0200	Foodmax Assembly Paste	Aeropack 200ml



Foodmax DWF spray is a non-toxic lubricating, penetrating and de-watering lubricant and is ideal for use on lightly loaded chains, bearings and slides in food and clean environments. Working temperature -30 °C to 145 °C.

Product Code	Description	Pack Size
FM-DDWFSPRAY-040	Foodmax DWF Spray	400g Aerosol

Silicone Spray - Foodmax® Silicon



A food grade, silicone based, anti-adherent and lubricating fluid with a very high temperature resistance. Great for packaging transport lines and for low load applications. Also suitable as anti adherent for any type of equipment, de-moulding of all type of plastics and rubbers and surface polisher.

Product Code	Description	Pack Size
FM-SILICONESPRAY-040	Foodmax Silicone Spray	400g Aerosol

Chain Spray - Foodmax® Multi



Foodmax Multi Spray is a totally waterproof tacky chain spray that contains food grade synthetic fluid and PTFE lubricant that endures aggressive environments and create a strong shear-stable lubrication film. Suitable for a broad range of applications including chains, conveyors, slides, joints, etc.

Product Code	Description	Pack Size
FM-MULTISPRAY -040	Foodmax Multi Spray	400g Aerosol

Cleaner Degreaser Spray - Foodmax® Clean



Foodmax Clean Spray is a food grade cleaner degreaser. This non-toxic formulation has been formulated to effectively clean grease and oil residue, formulated from a citrus oil derivative which is non-toxic, non-caustic, biodegradable and can be used safely with minimal protective equipment.

Product Code	Description	Pack Size
FM-CLEANSPRAY -040	Foodmax Clean Spray	400g Aerosol



Foodmax Clean E spray is a powerful, fast drying cleaner, ideal for cleaning electronic equipment and components in and around food processing areas, such as control panels, electric motors, electrical contacts and switches.

Product Code	Description	Pack Size
FM-CLEANESPRAY-040	Foodmax Clean E Spray	400g Aerosol

Grease Spray - Foodmax® CAS



Foodmax Grease CAS is a fully synthetic food grade spray grease based on calcium sulphonate. This technology is characterised by exceptional mechanical stability, high dropping point, high load carrying performance, reduced wear and excellent resistance to water, steam and corrosion. Foodmax Grease CAS can be used for general lubrication, slide ways, chains and high load bearings in the food industry.

Product Code	Description	Pack Size
FM-CASSPRAY-040	Foodmax Grease CAS Spray	400g Aerosol

White Oil Spray - Foodmax® Easy



Foodmax Easy Spray can be used as a general lubricant as a non sticky chain oil, bearings and slides with low load, a food grade mould release, hinges and as a cleaning and conserving agent for stainless steel. Foodmax Easy Spray can be used as a food grade mould release oil as well.

Product Code	Description	Pack Size
FM-EASYSpray-040	Foodmax Easy Spray	400g Aerosol

Dough Dividing Spray - Foodmax® DDO



This product is produced from ester based oil and special additives to warrant a trouble free and extremely clean operation when used as a dough divider oil. Consumption of Foodmax DDO Spray is about half to two times less than the conventional release agents found such as kitchen sunflower oil. Foodmax DDO Spray offers direct contact lubrication in dough dividing applications in case the use of mineral lubricants are not allowed because of local of domestic regulations.

Product Code	Description	Pack Size
FM-DDOSPRAY-040	Foodmax DDO Spray	400g Aerosol



Foodmax Release S Spray is a silicone based fluid, anti-adherent and lubricating incorporating high temperature resistance. NSF approved for the use in food processing equipment where incidental contact with food may occur. Excellent as lubricating product for packaging transport lines and for low load applications. Also suitable as anti-adherent for any type of equipment, de-moulding of all type of plastics and rubbers and surface polisher.

Product Code	Description	Pack Size
FM-RELEASE S SPRAY -040	Foodmax Release S Spray	400g Aerosol

Semi-Dry Lubricant - Foodmax® TFD



Foodmax TFD Spray is a clean, non-toxic, non-staining and semi-dry lubricant fortified with PTFE. Provides excellent low friction properties and reduces static. Designed for repetitive movement applications in environments where a non-sticky lubricant is required. Suitable for use in food, chemical and printing industry as well as other industries requiring a clean lubricant. Temperatures range (-20°C~120°C)

Product Code	Description	Pack Size
FM-TFDSpray -040	Foodmax TFD Spray	400g Aerosol

High Temp - Foodmax® Extreme



This product is based on highly polar biodegradable ester base oil and is inhibited against oxidation to give a long wet film life at high temperatures up to 285°C. Foodmax Extreme is designed for the lubrication any moving part in the food, cosmetic, pharmaceutical, textile, glass, steel, and wood industry. Foodmax Extreme possesses outstanding anti wear capacity and will reduce wear on chains significantly like no other.

Product Code	Description	Pack Size
FM-EXTREMESPRAY -040	Foodmax Extreme Spray	400g Aerosol

V-Belt Spray - Foodmax® V-Belt



This product is a food grade spray containing a product to protect and prevent V-belts from slipping. Foodmax V-Belt can be used on vehicles, drill presses, milling, food and agricultural machines, generators, conveyor belts, compressors, pumps, lawn movers, concrete mixers and many more applications where V-Belts are used. User friendly, help to prevent slipping and creaking, excellent adhesion, long-time protection, resistant to weather influences, dilatant, delays the wear of V-belts and has a directed jet spray.

Product Code	Description	Pack Size
FM-VBELTSPRAY -040	Foodmax V-Belt Spray	400g Aerosol



Cut ADE Tapping Fluid

For direct application specially formulated for drilling, threading, reaming and severe machining of steel in severe working conditions. It contains EP additives that avoid welding of tool and part and built-up edge formation thanks to the anti-seize properties.

Product Code	Size
MAT-CUTADE-050	500ml Bottle

CRC Treflex Cutting Compound



Treflex Cutting Paste is a green coloured, active cutting compound containing a colloid. It melts slowly as frictional heat is generated. It maintains efficient lubrication throughout operations such as pipe screwing, hack sawing, tapping and reaming.

Product Code	Description	Pack Size
CRC-TREF 2LT	Cutting Paste	2lt Tub
CRC-TREF 500ML	Cutting Paste	500ml Tub
CRC-TREF HD 500ML	Heavy Duty Cutting Fluid	500ml Bottle

Clean Wipes - Foodmax®



Food Grade Strong Wipes With Powerful Cleaner
NSF A1 Approved.

Foodmax Clean Wipes are strong two-sided cleaning wipes containing a powerful cleaner in a resealable container.

They are suitable to clean equipment, machine parts, work areas, tools, hands, and many other surfaces. Effectively removes heavy pollutants like oil, greases, tar, PU foam, resin, soot, grass stains, paint, ink, marker, toner and graffiti.

Product Code	Size
FM-CLEANWIPES	Tub of 100 wipes

Prolon - PTFE paste



The ultimate PTFE paste for the assembly of injection mould tools, it also provides excellent anti seize on many types of moving parts.

Product Code	Description	Pack Size
PROLON-250	PTFE 901 Paste Prolon	250g Tube
PROLON-500G	PTFE 901 Paste Prolon	500ml Tub
PROLON-20KG	PTFE 901 Paste Prolon	20kg Tub



The professionals choice. CRC 5.56 multi-purpose product has superior penetrating power, that breaks through rust and corrosion while it cleans away scale and dirt.

Also available in 175g, 500ml, 1litre, 200 litres

Product Code	Description	Pack Size
CRC-5.56CAN	CRC Multi-Purpose Spray	400g Aerosol
CRC-5.564LT	CRC Multi-Purpose Fluid	4 Litre
CRC-5.5620LT	CRC Multi-Purpose Fluid	20 Litre Drum

Performance WD Spray



Performance WD is a direct jet-spray to be used as a universal oil to lubricate and protect metal and plastic parts. It is suitable to unfasten rusted nuts and bolts, remove/avoid squeaking/creaking noises, grease and lubricate runners, joints, hinges and chains.

Product Code	Description	Pack Size
MAT-PERFORM-WD 040	Performance WD Spray	400g Aerosol

Performance X3



Performance X3 utilises a blend of synthetic fluids to transport M-FLON to critical bearing surfaces protecting them from wear and corrosion.

Applications:

- Lubricates and protects chains cables slide
- Protects against corrosion
- Penetrates and frees seized components
- Removes residues from old lubricants

Product Code	Description	Pack Size
MAT-PERFORM-X3 040	Performance X3 Spray	500ml Aerosol

CO Contact Cleaner



CRC CO Contact Cleaner is a unique, plastic safe, scientifically formulated, technically proven, stable, inert high purity cleaning solvent. Non-corrosive, non-staining, rapid complete evaporation and contains no lubricants. Contains COZOL a special proprietary blend of solvents which enhances the cleaning power without damaging plastics.

Product Code	Size
CRC-COCON CLEAN	350g Aerosol



All purpose spill absorber, made from 100% absorbant granules which are effective at absorbing spills and liquids.

Environmentally safe and easy to use 20kg bags.

Product Code	Pack Size
ABSORBCLAY	20 Kg Bag

Oil Absorbant Sheets



Extremely good absorption ability and capacity for all types of organic fluids, i.e.: motor oils, hydraulic oils, gear oils, organic solvents, diesel oil, petrol, etc.

Product Code	Size	Pack Size
ABSORBSHEET 100	40cm x 50cm	100 Sheets

Plastic Pump - 20L Food Grade



Ezy-Action food grade hand -operated piston pump is made of polypropylene for resistance to chemicals, dispenses liquids at a rate of 15oz. per stroke, and is suitable for dispensing viscous fluids, hard acids, or alkali cleaning chemicals

Product Code	Description
FG-PLASTICPUMP-020	Food Grade Plastic Pump 20 Litre

Drum Pump 20 Lt (Fits Matrix Pail)



- Suitable for Matrix 20 L pails
- Easy Down stroke displacement
- 1.5m anti-kink hose
- Fitted with anti-drip nozzle and drain back nozzle holder
- Ground shaft with 'O' ring seal
- Nylon head and handle
- Special threaded adaptor

Product Code	Description
FG-CA465GCM10	Food Grade Drum Pump 20 Litre



One hand grease gun with zinc plated steel barrel to suit 400g shuttle type cartridges, and an ergonomically designed pistol grip.

Fast and clean loading and unloading without opening the gun, eliminating any contamination.

Product Code	Description
FG-LUBESHUTTLEGUN	Food Grade Pistol Shuttle Gun

Lever Shuttle Gun Food Grade



Two hand grease guns features a high quality zinc plated steel barrel body and an ergonomic hand grip to suit 400g shuttle type cartridges.

Fast and clean loading and unloading without opening the gun, eliminating any contamination

Product Code	Description
FG-LEVERLUBESHUTTLE	Food Grade Lever Shuttle Gun

Pistol Grease Gun 450g



A classic grease gun that incorporates a unique variable stroke piston and valve arrangement for true one handed operation and can produce increased pressure through short strokes or high volume shot using a full stroke. Pistol-grip design to suit 450g grease cartridges, bulk filling or J3 grease transfer pump loading.

Product Code	Description
MAC-K2901	Pistol Grease Gun suits 450 gram cartridge

Lever Grease Gun 450g



A lever-action grease gun designed for high pressure / high volume greasing and can easily clear blocked or damaged grease nipples.

The grease gun features a durable die cast aluminium head, a heavy gauge steel barrel and a heavy duty follower assembly to handle a wide range of grease viscosities. Suits 450 gram grease cartridges, bulk filling or MacNaught J3 transfer loading.

Product Code	Description
MAC-K4501	Lever Grease Gun suits 450 gram cartridge



The Lever Action Barrel Pump is a telescopic suction tube for either 60 Litre or 205 Litre drums. Comes with 1 - 1/2" & 2" bung adapters. Can pump up to 500ml per stroke, depending on viscosity. Wetted materials: steel, aluminium, zinc, brass, NBR, viton and suitable for lubricating oils and service fluids.

Product Code	Description
MAC-LLBP	Lever Pump suits 60 & 205 Litre Drums

Rotary Pump



Rotary pumps offer easy self-priming and ability to deliver in both directions. For both 60 Litre & 205 Litre drums.

Product Code	Description
MAC-LRPH	Rotary Pump suits 60 & 205 Litre Drums

Drum Pump 20 Lt



Designed for dispensing most service fluids including engine, gear, transmission, hydraulic and some engine coolants from 20L - 25L drums. An extendible suction tube and two additional bung adapters ensure that the expanding range of different size and types of drums are easily catered for. An extra-long clear delivery hose gives easy identification of the fluid type and allows better reach into difficult areas.

Product Code	Description
MAC-MAOP20	Drum Pump 20 Litre

Grease Transfer Pump 20 Kg



Designed for fast, easy bulk filling of grease guns. This provides an economical solution for refilling most standard grease guns from bulk pails instead of purchasing more expensive grease cartridges. The sealed system also keeps grease free from contamination. A height adjustable lid and pump assembly offers compatibility with several different size grease pails up to 20kg. The J3 is the best choice for high volume / low pressure grease transfer, especially in remote or on-the-job applications.

Product Code	Description
MAC-J3-01	Grease Transfer Pump 20kg

Conversion Chart Metric-Imperial

Metric	Imperial	Inch	Gauge	Metric	Imperial	Inch	Gauge	Metric	Imperial	Inch	Gauge	Metric	Imperial	Inch	Gauge
0.010		0.0004		2.500		0.0984		5.953	15/64	0.2344		10.490		0.4130	Z
0.100		0.0039		2.527		0.0995	39	6.000		0.2362		10.500		0.4134	
0.150		0.0059	97	2.578		0.1015	38	6.045		0.2380	B	10.716	27/64	0.4219	
0.160		0.0063	96	2.642		0.1040	37	6.100		0.2402		10.800		0.4252	
0.170		0.0067	95	2.705		0.1065	36	6.147		0.2420	C	11.000		0.4331	
0.180		0.0071	94	2.778	7/64	0.1094		6.200		0.2441		11.112	7/16	0.4375	
0.190		0.0075	93	2.794		0.1100	35	6.248		0.2460	D	11.200		0.4409	
0.200		0.0079	92	2.819		0.1110	34	6.300		0.2480		11.500		0.4528	
0.210		0.0083	91	2.870		0.1130	33	6.350	1/4	0.2500	E	11.509	29/64	0.4531	
0.220		0.0087	90	2.946		0.1160	32	6.400		0.2520		11.800		0.4646	
0.230		0.0091	89	3.000		0.1181		6.500		0.2559		11.906	15/32	0.4688	
0.240		0.0094	88	3.048		0.1200	31	6.528		0.2570	F	12.000		0.4724	
0.254		0.0100	87	3.100		0.1220		6.600		0.2598		12.200		0.4803	
0.270		0.0106	86	3.175	1/8	0.1250		6.629		0.2610	G	12.303	31/64	0.4844	
0.280		0.0110	85	3.200		0.1260		6.700		0.2638		12.500		0.4921	
0.290		0.0114	84	3.264		0.1285	30	6.747	17/64	0.2656		12.700	1/2	0.5000	
0.300		0.0118		3.300		0.1299		6.756		0.2660	H	12.800		0.5039	
0.305		0.0120	83	3.400		0.1339		6.800		0.2677		13.000		0.5118	
0.317		0.0125	82	3.454		0.1360	29	6.900		0.2717		13.097	33/64	0.5156	
0.330		0.0130	81	3.500		0.1378		6.909		0.2720	I	13.494	17/32	0.5313	
0.343		0.0135	80	3.569		0.1405	28	7.000		0.2756		13.500		0.5315	
0.368		0.0145	79	3.572	9/64	0.1406		7.036		0.2770	J	13.891	35/64	0.5469	
0.397	1/64	0.0156		3.600		0.1417		7.100		0.2795		14.000		0.5512	
0.400		0.0157		3.658		0.1440	27	7.137		0.2810	K	14.288	9/16	0.5625	
0.406		0.0160	78	3.700		0.1457		7.144	9/32	0.2813		14.500		0.5709	
0.457		0.0180	77	3.734		0.1470	26	7.200		0.2835		14.684	37/64	0.5781	
0.500		0.0197		3.797		0.1495	25	7.300		0.2874		15.000		0.5906	
0.508		0.0200	76	3.800		0.1496		7.366		0.2900	L	15.081	19/32	0.5938	
0.533		0.0210	75	3.861		0.1520	24	7.400		0.2913		15.478	39/64	0.6094	
0.572		0.0225	74	3.900		0.1535		7.493		0.2950	M	15.500		0.6102	
0.600		0.0236		3.912		0.1540	23	7.500		0.2953		15.875	5/8	0.6250	
0.610		0.0240	73	3.969	5/32	0.1563		7.541	19/64	0.2969		16.000		0.6299	
0.635		0.0250	72	3.988		0.1570	22	7.600		0.2992		16.272	41/64	0.6406	
0.660		0.0260	71	4.000		0.1575		7.671		0.3020	N	16.500		0.6496	
0.700		0.0276		4.039		0.1590	21	7.700		0.3031		16.669	21/32	0.6563	
0.711		0.0280	70	4.089		0.1610	20	7.800		0.3071		17.000		0.6693	
0.742		0.0292	69	4.100		0.1614		7.900		0.3110		17.066	43/64	0.6719	
0.787		0.0310	68	4.200		0.1654		7.938	5/16	0.3125		17.462	11/16	0.6875	
0.794	1/32	0.0313		4.216		0.1660	19	8.000		0.3150		17.500		0.6890	
0.800		0.0315		4.300		0.1693		8.026		0.3160	O	17.859	45/64	0.7031	
0.813		0.0320	67	4.305		0.1695	18	8.100		0.3189		18.000		0.7087	
0.838		0.0330	66	4.366	11/64	0.1719		8.200		0.3228		18.256	23/32	0.7188	
0.889		0.0350	65	4.394		0.1730	17	8.204		0.3230	P	18.500		0.7283	
0.900		0.0354		4.400		0.1732		8.300		0.3268		18.653	47/64	0.7344	
0.914		0.0360	64	4.496		0.1770	16	8.334	21/64	0.3281		19.000		0.7480	
0.940		0.0370	63	4.500		0.1772		8.400		0.3307		19.050	3/4	0.7500	
0.965		0.0380	62	4.572		0.1800	15	8.433		0.3320	Q	19.447	49/64	0.7656	
0.991		0.0390	61	4.600		0.1811		8.500		0.3346		19.500		0.7677	
1.000		0.0394		4.623		0.1820	14	8.600		0.3386		19.844	25/32	0.7813	
1.016		0.0400	60	4.700		0.1850	13	8.611		0.3390	R	20.000		0.7874	
1.041		0.0410	59	4.762	3/16	0.1875		8.700		0.3425		20.241	51/64	0.7969	
1.067		0.0420	58	4.800		0.1890	12	8.731	11/32	0.3438		20.500		0.8071	
1.092		0.0430	57	4.851		0.1910	11	8.800		0.3465		20.638	13/16	0.8125	
1.181		0.0465	56	4.900		0.1929		8.839		0.3480	S	21.000		0.8268	
1.191	3/64	0.0469		4.915		0.1935	10	8.900		0.3504		21.034	53/64	0.8281	
1.321		0.0520	55	4.978		0.1960	9	9.000		0.3543		21.431	27/32	0.8438	
1.397		0.0550	54	5.000		0.1969		9.093		0.3580	T	21.500		0.8465	
1.500		0.0591		5.055		0.1990	8	9.100		0.3583		21.828	55/64	0.8594	
1.511		0.0595	53	5.100		0.2008		9.128	23/64	0.3594		22.000		0.8661	
1.588	1/16	0.0625		5.105		0.2010	7	9.200		0.3622		22.225	7/8	0.8750	
1.613		0.0635	52	5.159	13/64	0.2031		9.300		0.3661		22.500		0.8858	
1.702		0.0670	51	5.182		0.2040	6	9.347		0.3680	U	22.622	57/64	0.8906	
1.778		0.0700	50	5.200		0.2047		9.400		0.3701		23.000		0.9055	
1.854		0.0730	49	5.220		0.2055	5	9.500		0.3740		23.019	29/32	0.9063	
1.900		0.0748		5.300		0.2087		9.525	3/8	0.3750		23.416	59/64	0.9219	
1.930		0.0760	48	5.309		0.2090	4	9.576		0.3770	V	23.500		0.9252	
1.984	5/64	0.0781		5.400		0.2126		9.600		0.3780		23.812	15/16	0.9375	
1.994		0.0785	47	5.410		0.2130	3	9.700		0.3819		24.000		0.9449	
2.000		0.0787		5.500		0.2165		9.800		0.3858		24.209	61/64	0.9531	
2.057		0.0810	46	5.556	7/32	0.2188		9.804		0.3860	W	24.500		0.9646	
2.083		0.0820	45	5.600		0.2205		9.900		0.3898		24.606	31/32	0.9688	
2.184		0.0860	44	5.613		0.2210	2	9.922	25/64	0.3906		25.000		0.9843	
2.261		0.0890	43	5.700		0.2244		10.000		0.3937		25.003	63/64	0.9844	
2.375		0.0935	42	5.791		0.2280	1	10.084		0.3970	X	25.400	1	1.0000	
2.381	3/32	0.0938		5.800		0.2283		10.200		0.4016					
2.438		0.0960	41	5.900		0.2323		10.262		0.4040	Y				
2.489		0.0980	40	5.944		0.2340	A	10.319	13/32	0.4063					



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CONTACT HALES

www.hales.com.au

info@hales.com.au

1300 660 854

VICTORIA

45 Woodlands Drive
Braeside
Victoria 3195
Phone: (03) 8587 1600

NEW SOUTH WALES

Phone: (02) 9791 1011

QUEENSLAND

Phone: (07) 3272 7500

SOUTH AUSTRALIA

Phone: (08) 8297 1722

SINGAPORE

Hales Asia Pte Ltd
2 Ang Mo Kio Street 64
#04-03B
Econ Industrial Building
Singapore 569084
Tel: +65 6754 7077