



hales[®]



**2025
PRESS TOOLING**



DIE SETS

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PINS & BUSHES

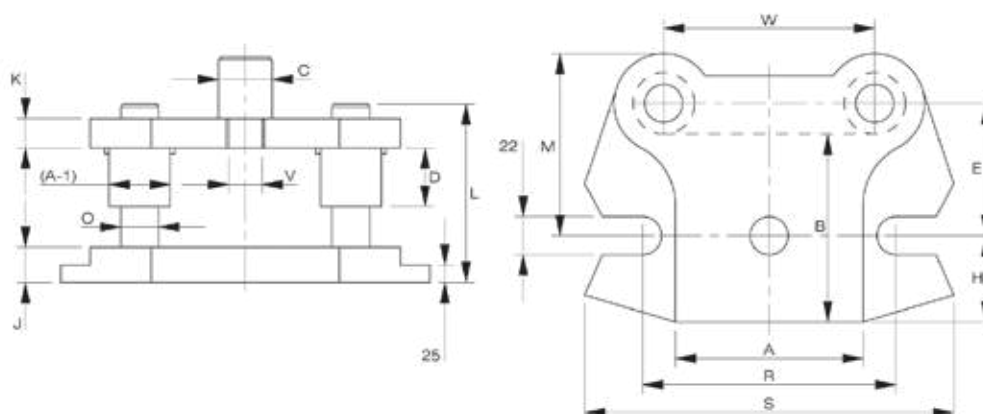
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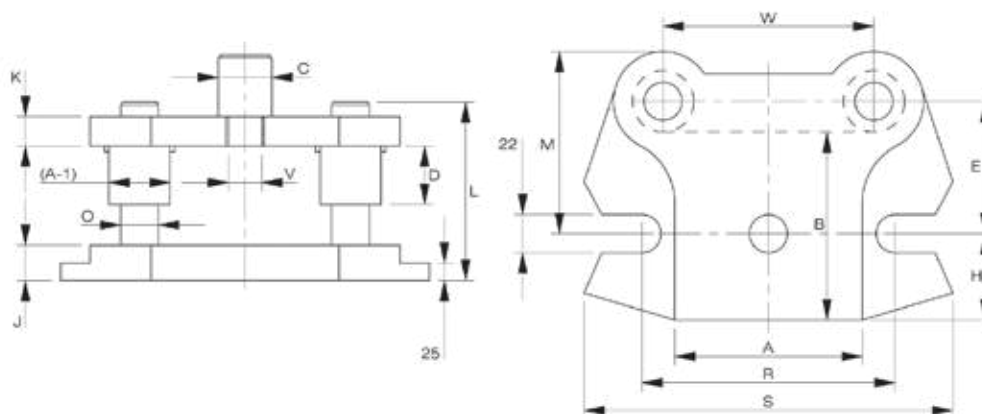
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PRESS TOOLING ACCESSORIES

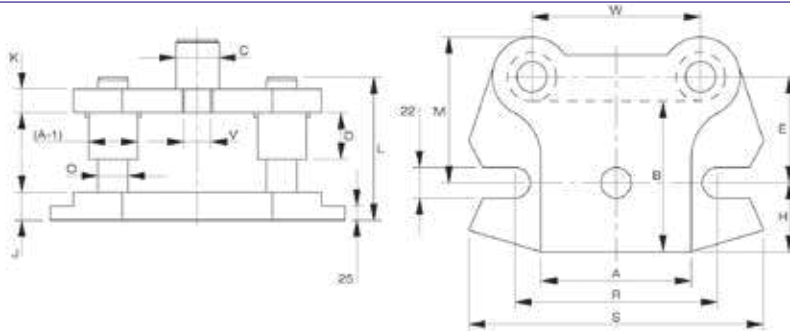
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Product Code	Die Area		Shank Dia	Pin Length	General Dimensions											BSF
	A	B	C	L	W	E	H	J	K	M	O	A-1	R	S	D	V
	Inches				Millimetres											Inches
HRPS-33A	3	3	1 1/4	4 1/2	76.2	55.5	38.1	22.2	22.2	84.1	0.7355	28.63	152.4	203	44.47	3/4
HRPS-44A	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

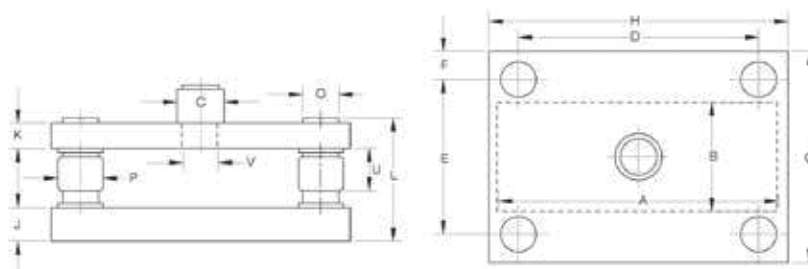


Product Code	Die Area		Shank Dia	Pin Length	General Dimensions											BSF
	A	B	C	L	W	E	H	J	K	M	O	A-1	R	S	D	V
	Inches				Millimetres											Inches
HRPS-146A	14	6	2	5 3/4	355.6	100	76.2	38.5	30.5	141.3	1.2355	53.97	425.4	476.2	60.33	1 1/4
HRPS-146B	14	6	2	6 1/2	355.6	100	76.2	48.5	30.5	141.3	1.2355	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

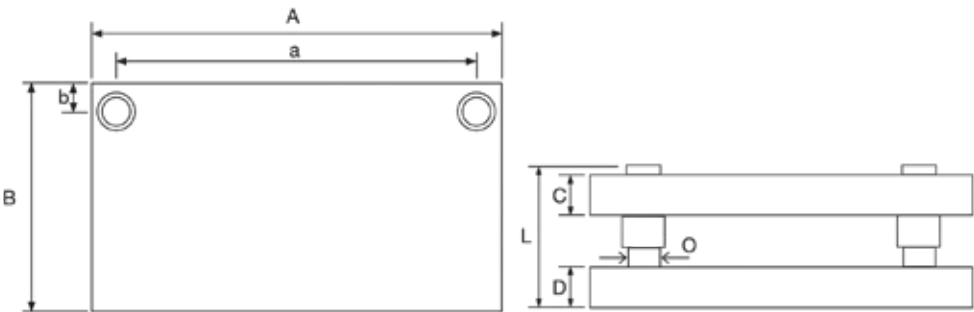


Product Code	Die Area		Shank Dia	Pin Length	General Dimensions							Pin Dia	Bush	BSF
	A	B	C	L	D	E	G	H	J	K	P	O	U	V
	Inches				Millimetres							Inches		
H4PS-106A	10	5 1/2	2	5 3/4	235	187.3	276	323.9	40	40	44.45	0.9855	57.17	1 1/4
H4PS-126A	12	5 1/2	2	5 3/4	279.4	193.7	289	374.7	40	40	53.97	1.2355	60.33	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

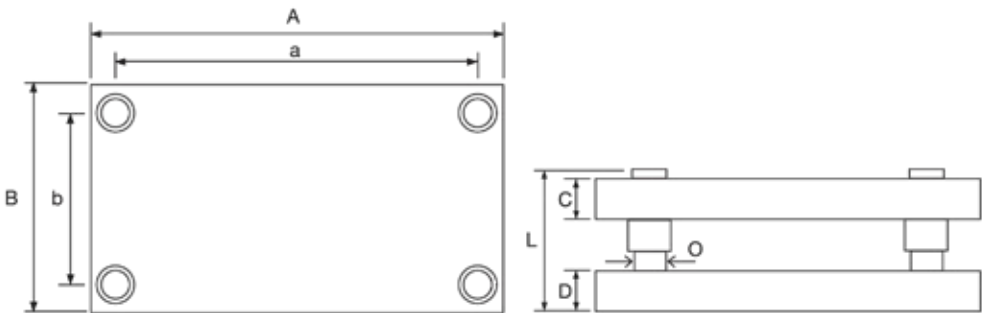


The following options are available on request:

- 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

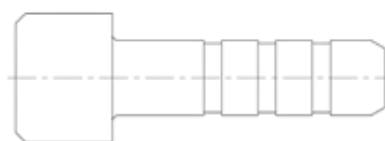
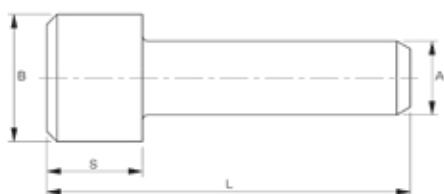


Hales Line Ream Stepped Pin

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

Note:

This style from EPH 38-175 to larger sizes



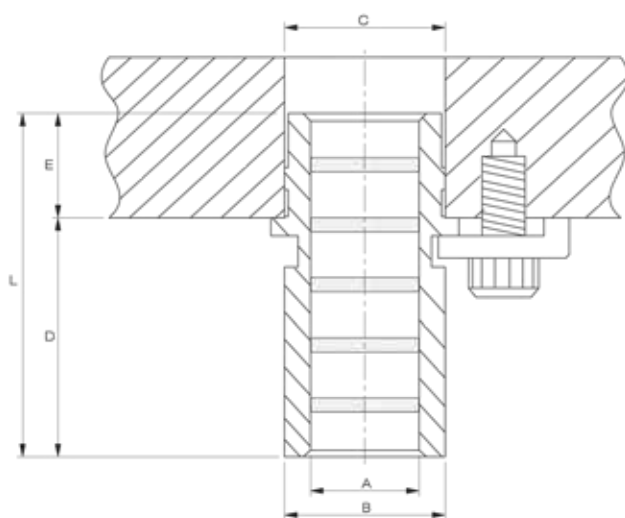
Product Code	A	B	S	L
EPH-20:80	18.68	28.63	25	82
EPH-20:100	18.68	28.63	25	100
EPH-20:125	18.68	28.63	25	125
EPH-20:175	18.68	28.63	25	175
EPH-25:100	25.03	38.15	38	100
EPH-25:125	25.03	38.15	38	125
EPH-25:150	25.03	38.15	38	150
EPH-25:175	25.03	38.15	38	175
EPH-25:200	25.03	38.15	38	200
EPH-32:100	31.38	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

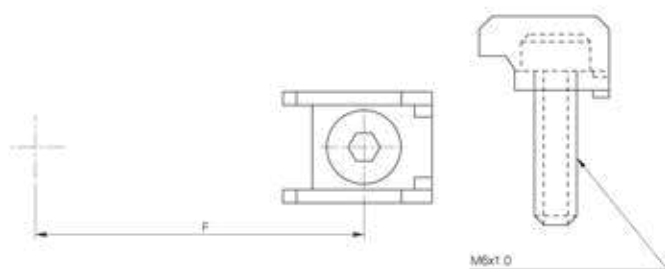
Hales self lubricating die components offer industry standard, maintenance free performance resulting in overall cost savings and operational safety. These bushes are standard components in all Hales die sets. 3 x Toe Clamps included

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



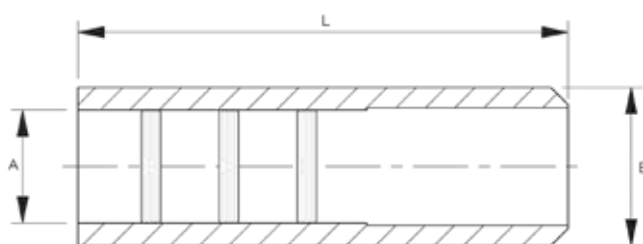
Product Code	Description
HRBTC	Toe Clamp



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:

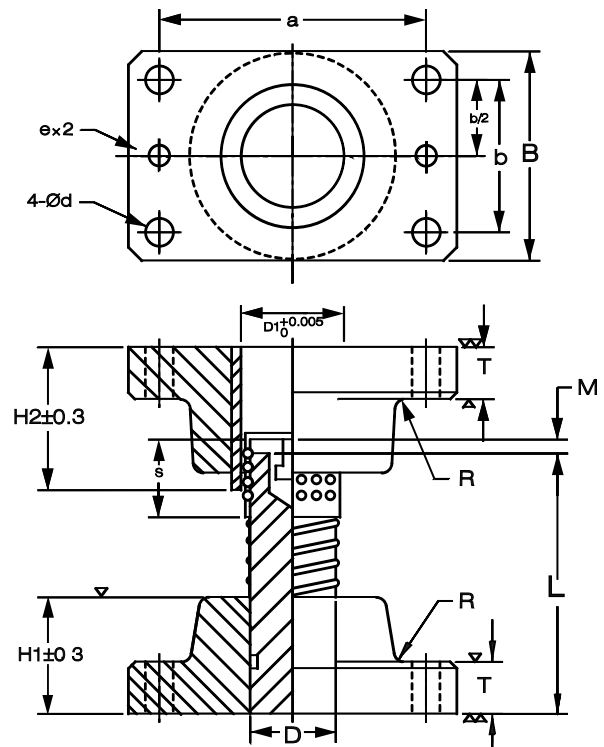
Guide post - Deep core strength case hardened materials

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

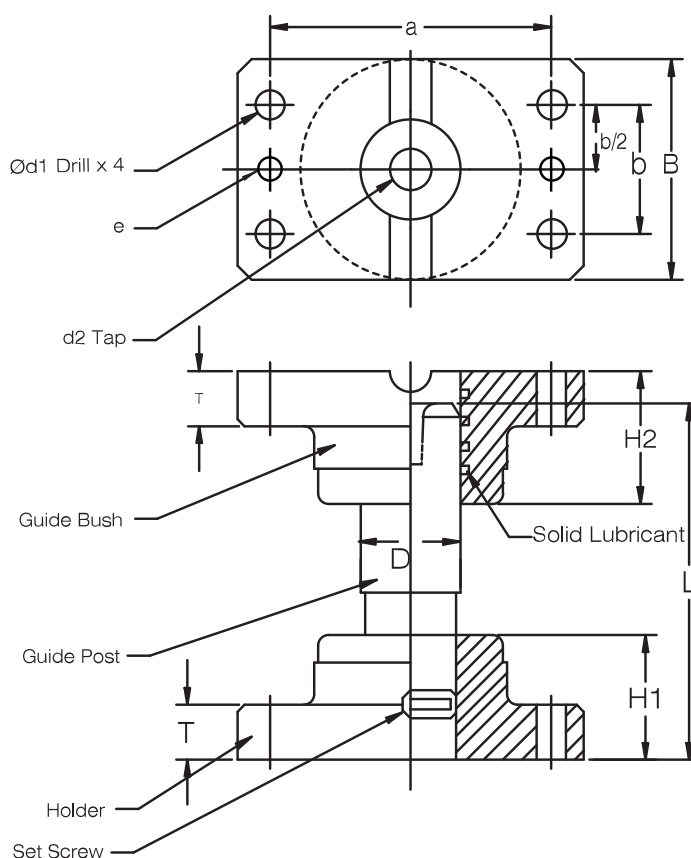
When assembling, two dowel pins are to be fitted in guide bush and holder.
Please note: Dowels and screws are included in assembly.

Materials:

Guide post - Deep core strength case hardened materials.

Holder - Automotive high alloyed iron

Guide bush - Automotive high alloyed iron with solid lubricant.



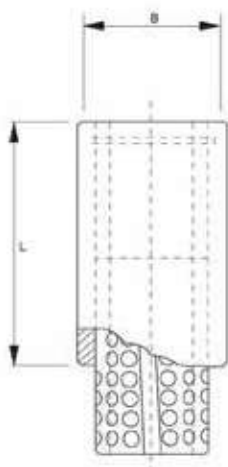
Product Code	øD	L	A	B	H1	H2	a	b	T	ød1	e=H7	H7	screw 8pcs	dowel 4pcs
PSGR25-100	25	100	84	48	30	45	66	30	20	9	8.0	+0.015 0	M8x35	8x30
PSGR25-120		120												
PSGR32-120	32	120	100	58	40	50	76	36	20	11	8.0	+0.015 0	M10x40	8x30
PSGR32-140		140												
PSGR32-160		160												
PSGR38-120	38	120	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

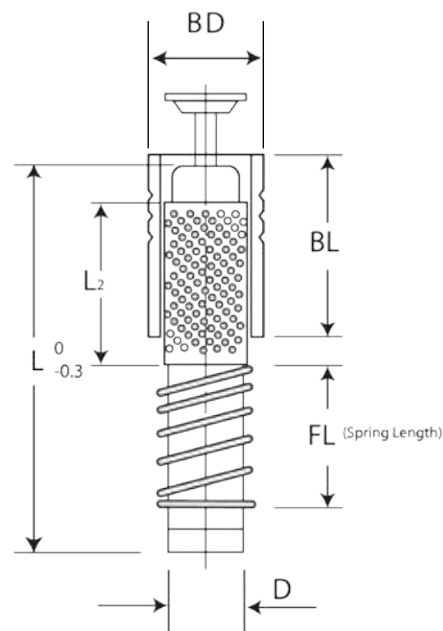


Ball Bearing Pins and Bushes offer distinct advantages:

- 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			



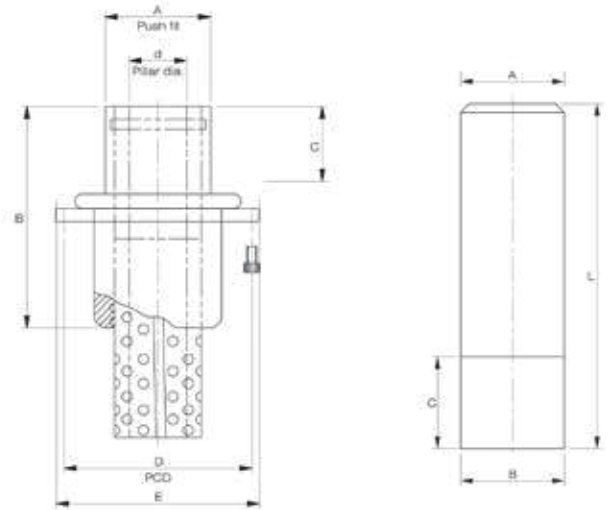
FULL RANGE																			
Code	D	L														BL	FL	L2	BD
PPS	20	100	110	120	130	140	150	160	170	180						L50	40-140	50	37
	22			120	130	140	150	160	170	180						L50	40-140	50	40
																L60		60	40
	25			120	130	140	150	160	170	180					L60	40-150	60	45	
															L80		75	45	
	28					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

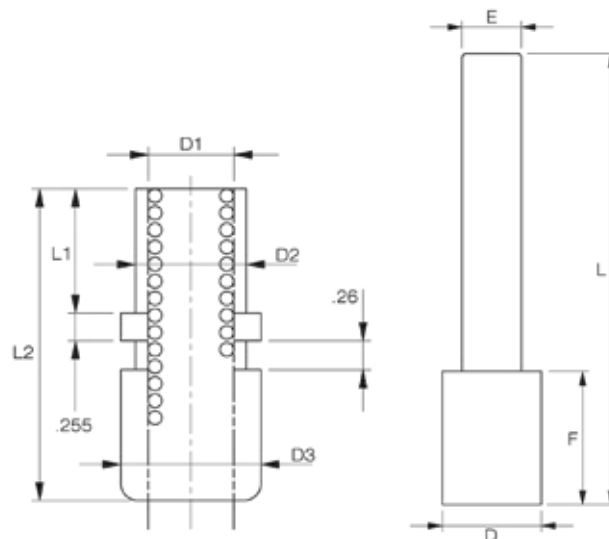
Product Code	A	B	C	L
EXP0.75 X 5.5	0.75	0.7355	1.25	5.5
EXP1 X 6	1	0.9855	1.5	6
EXP1 X 6.5	1	0.9855	1.5	6.5
EXP1 X 7.5	1	0.9855	1.5	7.5
EXP1.25 X 6	1.25	1.2355	2	6
EXP1.25 X 6.5	1.25	1.2355	2	6.5
EXP1.25 X 7.5	1.25	1.2355	2	7.5
EXP1.25 X 8.5	1.25	1.2355	2	8.5
EXP1.50 X 7.5	1.5	1.4855	2	7.5
EXP1.50 X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



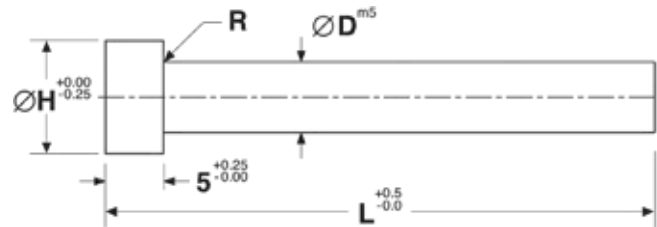
Product Code	D (+.0000-.0002)	E	F	L
A1-1x4.5	0.9855	0.9	1.25	4.5
A1-1x5.75	0.9855	0.9	1.25	5.75
A1-1x7	0.9855	0.9	1.25	7
A1-1x7.5	0.9855	0.9	1.25	7.5
A1-1x8	0.9855	0.9	1.25	8
A1-1.25X5.75	1.2355	1.15	1.5	5.75
A1-1.25X6.5	1.2355	1.15	1.5	6.5
A1-1.25X7	1.2355	1.15	1.5	7
A1-1.25X7.5	1.2355	1.15	1.5	7.5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

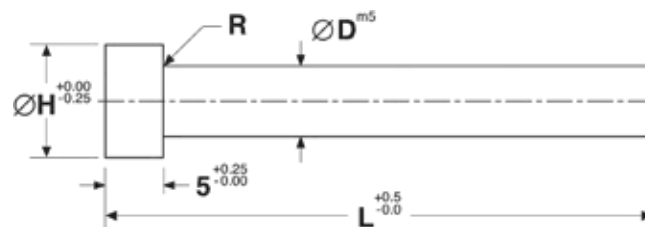


D	H	HSS - Metric				
		72	100	120	150	160
2	5		HGPSB-02100-M2			
2.5	5.5		HGPSB-025100-M2			
3	6	HGPSB-03072-M2	HGPSB-03100-M2			
3.5	6.5		HGPSB-035100-M2			
4	7	HGPSB-04072-M2	HGPSB-04100-M2			
4.5	7.5		HGPSB-045100-M2			
5	8	HGPSB-05072-M2	HGPSB-05100-M2			
5.5	8.5		HGPSB-055100-M2			
6	9	HGPSB-06072-M2	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.

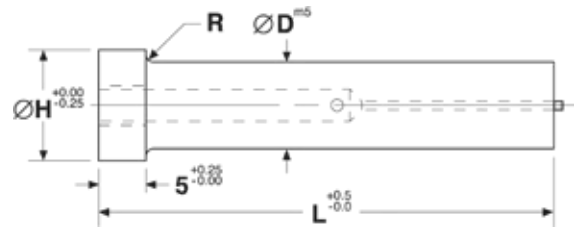


D	H	A2 - Metric		
		72	100	120
3	6	HGPSB-03072-A2	HGPSB-03100-A2	
4	7	HGPSB-04072-A2	HGPSB-04100-A2	
5	8	HGPSB-05072-A2	HGPSB-05100-A2	
6	9	HGPSB-06072-A2	HGPSB-06100-A2	
7	10	HGPSB-07072-A2	HGPSB-07100-A2	
8	11	HGPSB-08072-A2	HGPSB-08100-A2	HGPSB-08120-A2
9	12	HGPSB-09072-A2	HGPSB-09100-A2	
10	13	HGPSB-10072-A2	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.

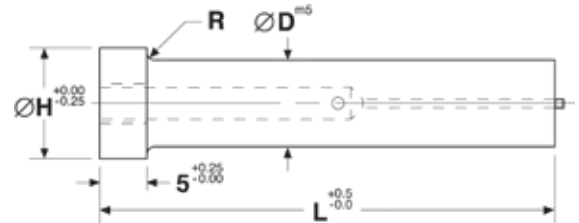


D	H	HSS - Metric			
		56	63	71	80
5	8	HGESB-05056-M2	HGESB-05063-M2	HGESB-05071-M2	HGESB-05080-M2
6	9	HGESB-06056-M2	HGESB-06063-M2	HGESB-06071-M2	HGESB-06080-M2
8	11	HGESB-08056-M2	HGESB-08063-M2	HGESB-08071-M2	HGESB-08080-M2
10	13	HGESB-10056-M2	HGESB-10063-M2	HGESB-10071-M2	HGESB-10080-M2
12	15	HGESB-12056-M2	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

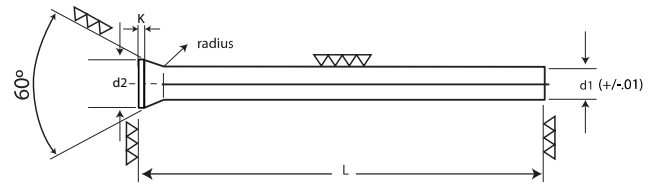
D	H	HSS - Metric		
		90	100	120
5	8	HGESB-05090-M2	HGESB-05100-M2	
6	9	HGESB-06090-M2	HGESB-06100-M2	
7	10		HGESB-07100-M2	
8	11	HGESB-08090-M2	HGESB-08100-M2	
10	13	HGESB-10090-M2	HGESB-10100-M2	
12	15	HGESB-12090-M2	HGESB-12100-M2	HGESB-12120-M2
13	16	HGESB-13090-M2	HGESB-13100-M2	
14	17	HGESB-14090-M2	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

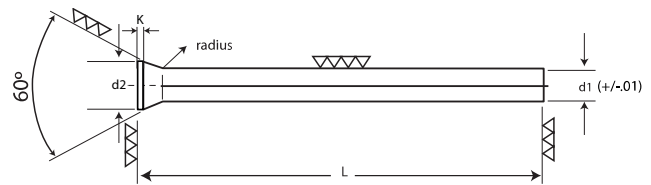


Materials: (HSS) M2, Tungsten High Speed Steel
Shank Hardness: 64 +/- 2 Hrc
Head Hardness: 50 +/- 5 Hrc.

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

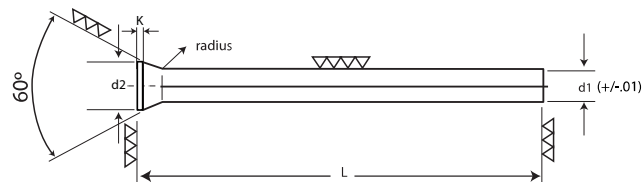


Materials: (HSS) M2, Tungsten High Speed Steel
Shank Hardness: 64 +/- 2 Hrc
Head Hardness: 50 +/- 5 Hrc.

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.

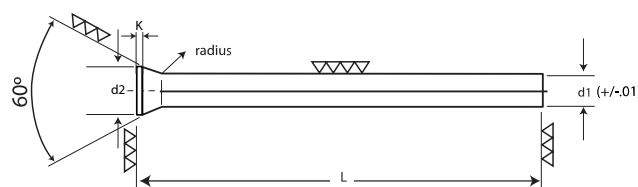
Materials: (A2) 12% Chromium Tool Steel

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.

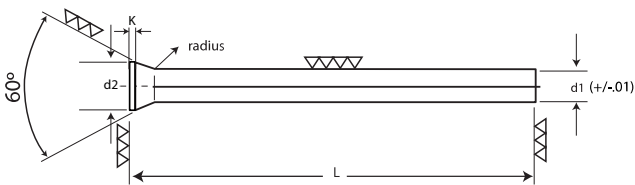
Materials: (A2) 12% Chromium Tool Steel

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.

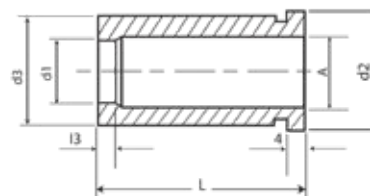
DIA d1	d2 +/- 0.1	K +0.2 R-3	HSS		
			70	80	100
19.50	22	1.0	DF-1950-070-M2	DF-1950-080-M2	DF-1950-100-M2
20.00	22	1.0	DF-2000-070-M2	DF-2000-080-M2	DF-2000-100-M2
21.00	23	1.0	DF-2100-070-M2	DF-2100-080-M2	DF-2100-100-M2
22.00	24	1.0	DF-2200-070-M2	DF-2200-080-M2	DF-2200-100-M2
23.00	25	1.0	DF-2300-070-M2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

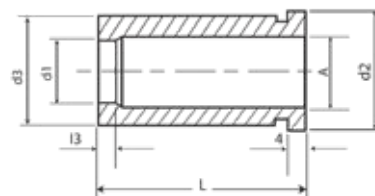
Material: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc.
Head Hardness: 45 +/- 5 Hrc.

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.

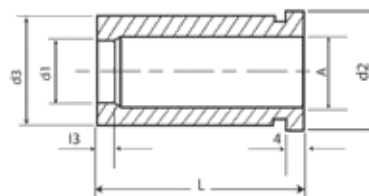
Material: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc.
Head Hardness: 45 +/- 5 Hrc.

DIA d1	DIA d3	d2	A	l3	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	l3	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.

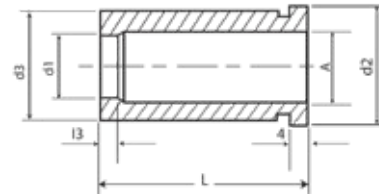
Material: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc.
Head Hardness: 45 +/- 5 Hrc.

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.

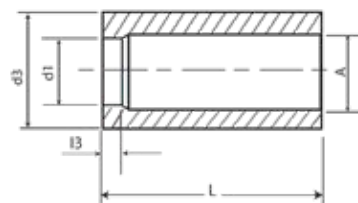
Material: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc.
Head Hardness: 45 +/- 5 Hrc.

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.

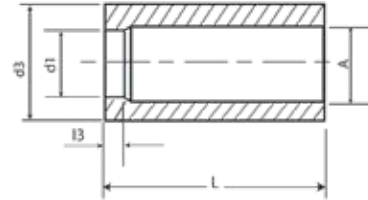
DIA d1	DIA d3	A	l3	HSS	
				20	28
1.00	6	2.5	2	DIA-0100-20-M2	DIA-0100-28-M2
1.05	6	2.5	2	DIA-0105-20-M2	
1.10	6	2.5	2	DIA-0110-20-M2	DIA-0110-28-M2
1.20	6	2.5	2	DIA-0120-20-M2	DIA-0120-28-M2
1.30	6	2.5	2	DIA-0130-20-M2	DIA-0130-28-M2
1.40	6	2.5	2	DIA-0140-20-M2	DIA-0140-28-M2
1.50	6	2.5	2	DIA-0150-20-M2	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	l3	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.

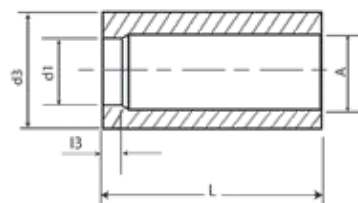
DIA d1	DIA d3	A	I3	HSS	
				20	28
5.10	12	6.5	4	DIA-0510-20-M2	DIA-0510-28-M2
5.20	12	6.5	4	DIA-0520-20-M2	DIA-0520-28-M2
5.25	12	6.5	4	DIA-0525-20-M2	
5.30	12	6.5	4	DIA-0530-20-M2	DIA-0530-28-M2
5.40	12	6.5	4	DIA-0540-20-M2	DIA-0540-28-M2
5.50	12	6.5	4	DIA-0550-20-M2	DIA-0550-28-M2
5.60	12	6.5	4	DIA-0560-20-M2	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	
				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.

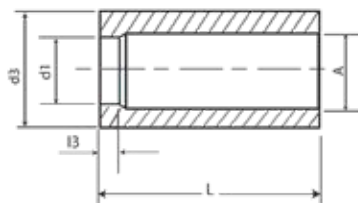
Material: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc.
Head Hardness: 45 +/- 5 Hrc.

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.

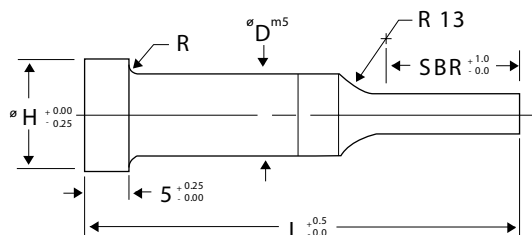
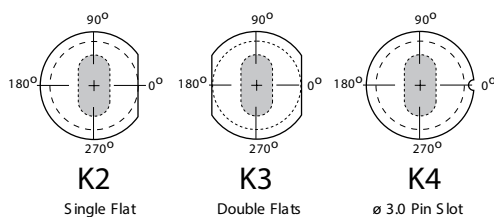
Material: (A2) 12% Chromium Tool Steel
Shank Hardness: 62 +/- 2 Hrc.
Head Hardness: 45 +/- 5 Hrc.

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		

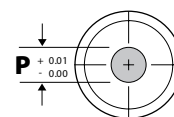
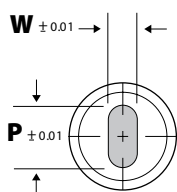
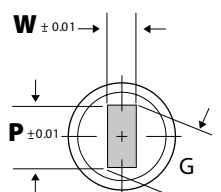
R =  O =  S =  H = 

Key-Flats in Die Position



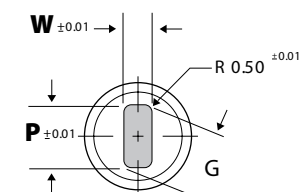
HGPSR

Round

GPSO
OblongGPSS
Square/rectDiagonal "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

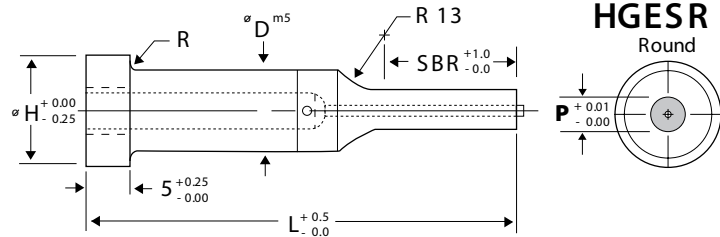
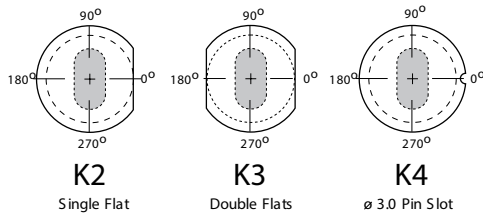
A2 = R/c 59-61 double tempered
 M2 = R/c 61-63 triple tempered
 Heads drawn to Rc 40-55

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

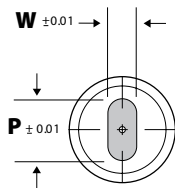
Type	D	Point length SBR						Overall Length							Round P min.	Shape W min.	Head Dia. H
		8	10	13	19	25	32	50	56	63	71	80	90	100			
HGPS_	4	8	10					50	56	63					0.8	0.8	7
HGPS_	5	8	10	13				50	56	63	71				1.3	1.3	8
HGPS_	6	8	10	13				50	56	63	71	80			1.4	1.4	9
HGPS_	8	8	10	13				50	56	63	71	80			1.5	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 = 

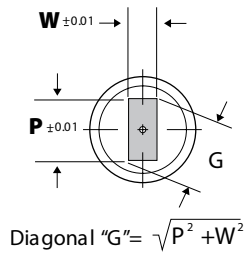
Key-Flats in Die Position



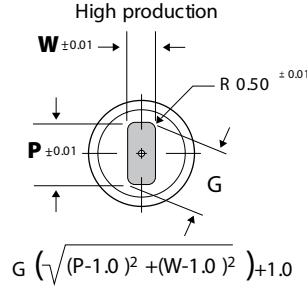
HGESO



HGESS



HGESH



Ordering Example

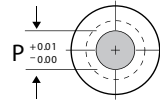
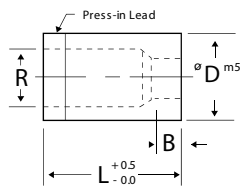
HGERS 13-13-71-M2 P10.1

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	

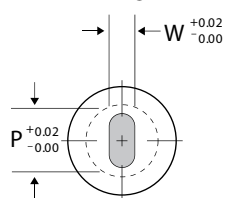
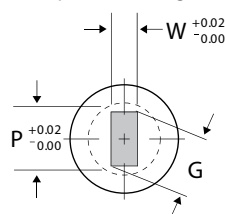
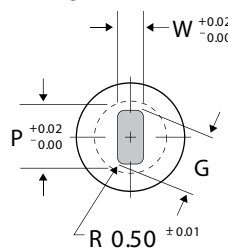
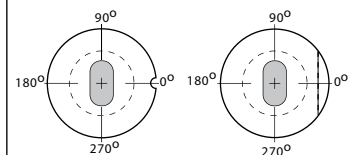
Type	D	Point length SBR						Overall Length							Round P min.	Shape W min.	Head Dia. H
		8	10	13	19	25	32	50	56	63	71	80	90	100			
HGES_	5	8	10	13				50	56	63	71				1.9	1.9	8
HGES_	6	8	10	13				50	56	63	71	80			2	2	9
HGES_	8	8	10	13				50	56	63	71	80			2.9	2.9	11
HGES_	10		10	13	19			50	56	63	71	80	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 Slot

K2

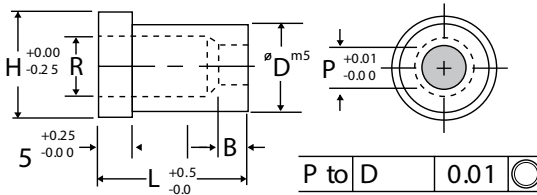
Single Flat

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

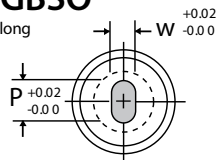
HGBSR 13-28 A2 P4.5

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

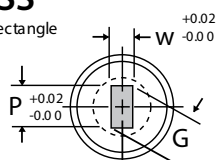
HGBSO

Oblong



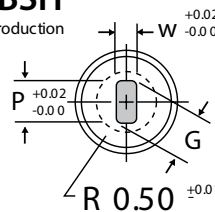
HGBSS

Square/Rectangle



HGBSH

High production



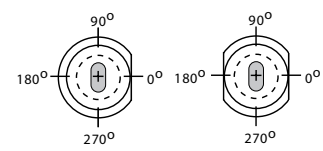
P & W to D 0.02

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

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

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

Key-Flats in Die Position

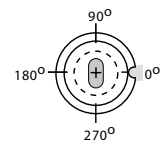


K2

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:

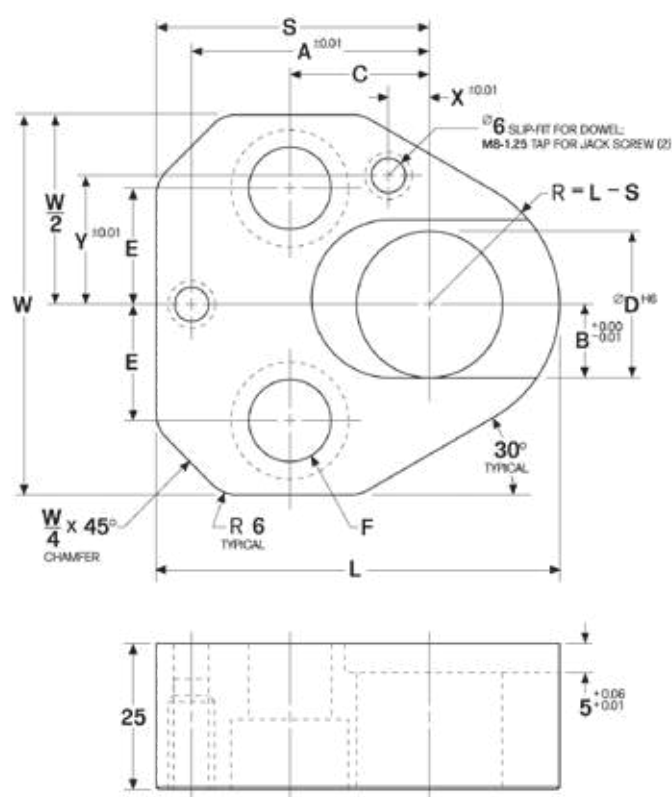
2 socket head cap screws

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.

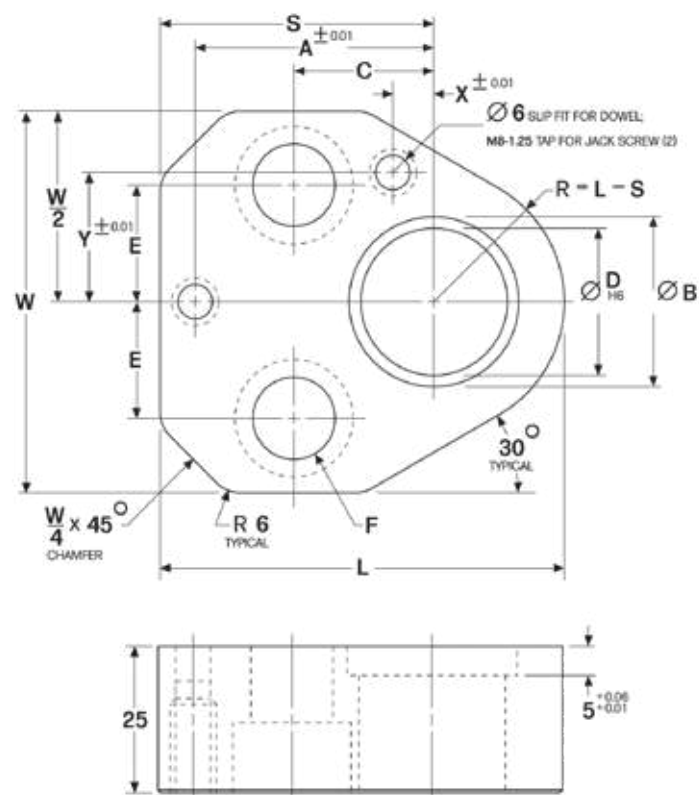


Product Code	D	W	L	B	S	A	C	E	X	Y	F
PRSF10	10	41.0	43.5	5.0	34.0	26.924	19.05	11.12	7.5	9.0	M8
PRSF13	13	48.5	49.6	6.5	37.0	29.972	19.05	14.27	6.5	12.0	M8
PRSF16	16	51.7	52.7	8.0	38.6	31.750	19.05	15.87	6.0	13.5	M8
PRSF20	20	56.8	59.3	10.0	41.9	33.528	19.05	17.47	5.0	16.5	M10
PRSF25	25	64.5	68.9	12.5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

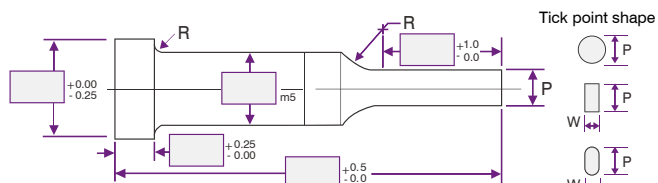
A Speedy Solution for Round Punches and Pilots: (Dowels are finished and retainer ready for CNC mounting. Counter-bore is sized to accept shoulder/headed punches. Also, the dowel holes are tapped for easy removal in confined spaces.



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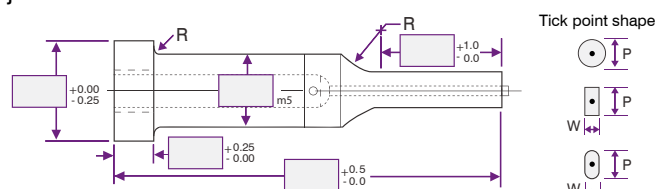
P=	W=	Qty=
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P=	W=	Qty=
----	----	------

Please tick the material required below

MAT Type ☐ HSS ☐ Toolsteel ☐

Ejector Punch



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

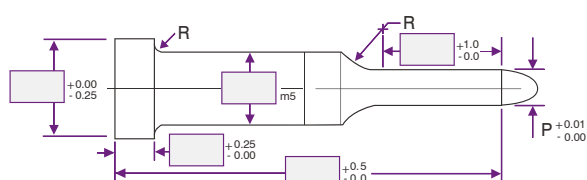
P=	W=	Qty=
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P=	W=	Qty=
----	----	------

Please tick the material required below

MAT Type ☐ HSS ☐ Toolsteel ☐

Parabolic Pilot



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

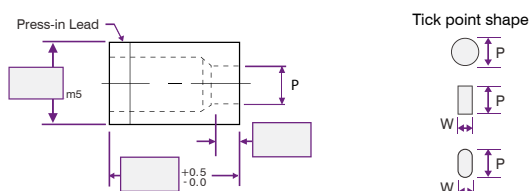
P=	Qty=
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P=	Qty=
----	------

Please tick the material required below

MAT Type ☐ HSS ☐ Toolsteel ☐

Die Button Press Fit



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

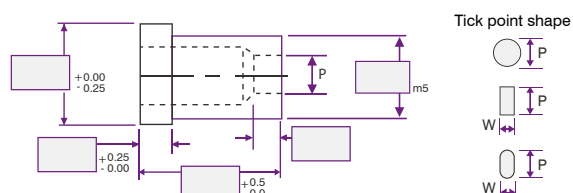
P=	W=	Qty=
----	----	------

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

Please tick the material required below

MAT Type ☐ HSS ☐ Toolsteel ☐

Die Button Shoulder



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

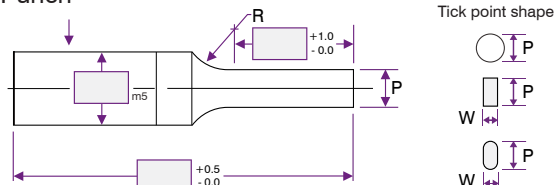
P=	W=	Qty=
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P=	W=	Qty=
----	----	------

Please tick the material required below

MAT Type ☐ HSS ☐ Toolsteel ☐

Headless Punch



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

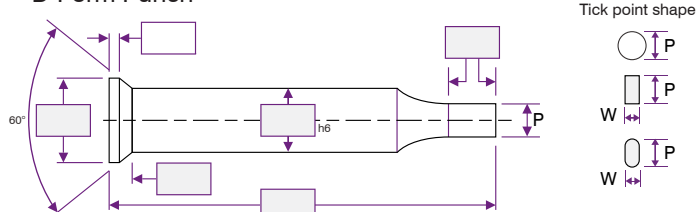
P=	W=	Qty=
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P=	W=	Qty=
----	----	------

Please tick the material required below

MAT Type ☐ HSS ☐ Toolsteel ☐

D-Form Punch



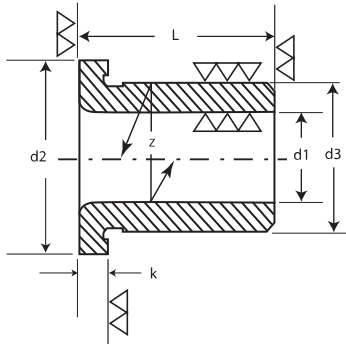
P=	W=	Qty=
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P=	W=	Qty=
----	----	------

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

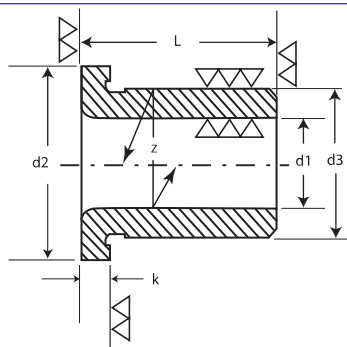
MAT Type ☐ HSS ☐ Toolsteel ☐



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



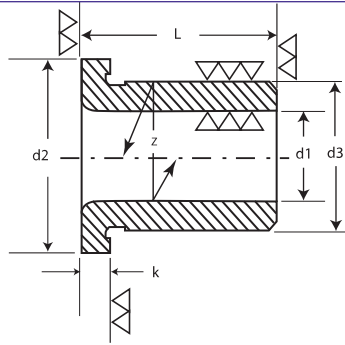
d1 F7	d3 n6	d2	k	z	Product Code -Short	Short Length	Product Code -Long	Long Length
0.4	3.0	6	2	0.01	DG172-004-3-6S	6	DG172-004-3-9L	9
0.5	3.0	6	2	0.01	DG172-005-3-6S	6	DG172-005-3-9L	9
0.6	3.0	6	2	0.01	DG172-006-3-6S	6	DG172-006-3-9L	9
0.7	3.0	6	2	0.01	DG172-007-3-6S	6	DG172-007-3-9L	9
0.8	3.0	6	2	0.01	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



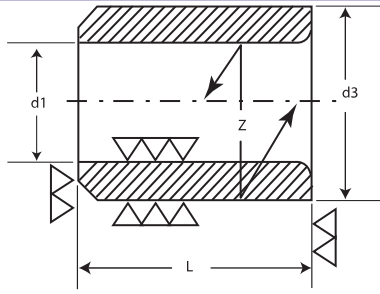
d1 F7	d3 n6	d2	k	z	Product Code -Short	Short Length	Product Code -Long	Long Length
5.0	8.0	12	2S/3L	0.01	DG172-050-8-8S	8	DG172-050-8-12L	12
5.1	10.0	14	3	0.02	DG172-051-10-10S	10	DG172-051-10-16L	16
5.2	10.0	14	3	0.02	DG172-052-10-10S	10	DG172-052-10-16L	16
5.3	10.0	14	3	0.02	DG172-053-10-10S	10	DG172-053-10-16L	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



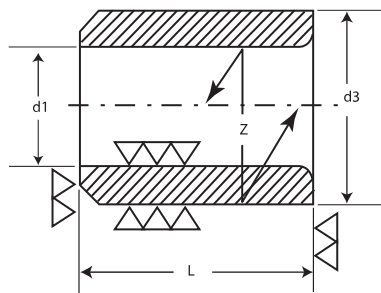
d1 F7	d3 n6	d2	k	z	Product Code -Short	Short Length	Product Code -Long	Long Length
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9.9	15.0	19	4	0.02	DG172-099-15-12S	12	DG172-099-15-20L	20
10.0	15.0	19	4	0.02	DG172-100-15-12S	12	DG172-100-15-20L	20
10.1	18.0	22	4	0.02	DG172-101-18-12S	12	DG172-101-18-20L	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

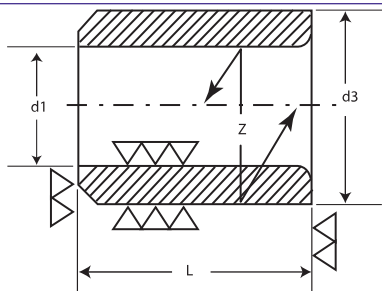


d1 F7	d3 n6	z	Product Code -Short	Short Length	Product Code -Long	Long Length
0.4	3.0	0.01			DG179-004-3-9L	9
0.5	3.0	0.01			DG179-005-3-9L	9
0.6	3.0	0.01			DG179-006-3-9L	9
0.7	3.0	0.01			DG179-007-3-9L	9
0.8	3.0	0.01	DG179-008-3-6S	6	DG179-008-3-9L	9
0.9	3.0	0.01	DG179-009-3-6S	6	DG179-009-3-9L	9
1.0	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
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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
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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



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