



BROACHING & PRODUCTION EQUIPMENT

Marlco Litecut Metric/Imperial Keyway Broaches..... **27-4 to 27-6, 27-8**

Marlco Litecut Metric/Imperial Keyway Guides & Shims..... **27-5, 27-9**

Marlco Hevicut Metric/Imperial Keyway Broaches..... **27-10 to 27-12, 27-14**

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Marlco Square Push Broaches Metric & Imperial..... **27-16 to 27-17**

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Keyway Push Broaches

Two ranges of Keyway Push Broaches are offered — Litecut and Hevicut. Both ranges are available as boxed sets or as individual items. Keyways produced conform to BS.4235: Part 1 (normal fit Js9) and DIN 6885 for metric sizes, and BS.46: Part 1 for inch sizes.

Cutting angles are designed to suit most materials. The use of an appropriate cutting fluid is essential and for steel, an oil with high pressure additives is recommended.

LITECUT — Keyway widths from 2mm to 25mm in bore diameters from 6mm to 95mm, and from 1/16" to 1" widths in bore diameters from 1/4" to 4".

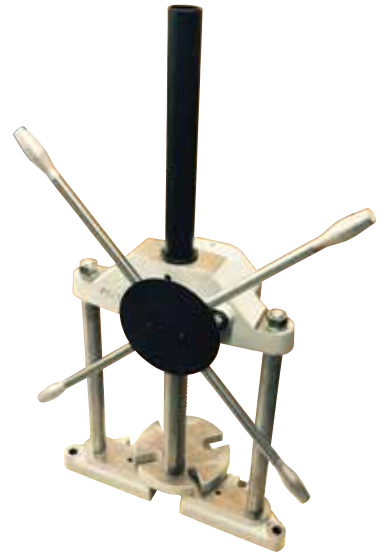
Parallel keyways can be cut by using the appropriate guide.

HEVICUT — Keyway widths from 2mm to 18mm in bore diameters from 6mm to 65mm, and from 1/16" to 3/4" widths in bore diameters from 1/4" to 3".

With the Hevicut range, Parallel keyways can be cut.

These broaches, having a heavier cut per tooth, require a greater load but generally fewer passes.

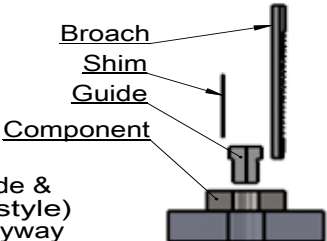
When using broach styles H4, H4M, H5 and H5M an extension shank is required. This is not supplied.

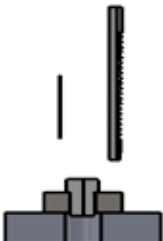


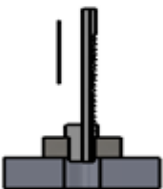
The 6501/6551 two speed presses, ideal for push broaching

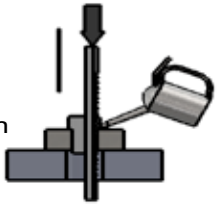
Keyway Broaching Instructions

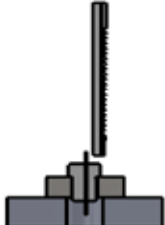
1. Select broach, guide & shims (of same style) to suit bore and keyway



2. Insert guide in bore and ensure there is clearance for broach to pass through base slot on press.


3. Place broach in guide slot. Ensure broach is square in component and first cutting tooth is in contact.

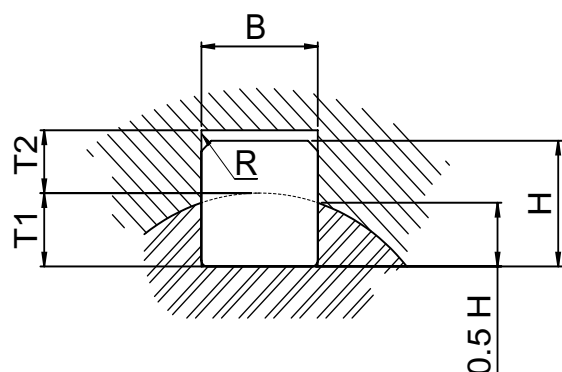

4. Apply cutting oil. Push broach smoothly through component. If tail of broach is not long enough to push last tooth through, use extension shank


5. Insert appropriate shim in guide slot for multi-pass broaches


6. Insert broach in guide slot and repeat steps 3, 4, and 5 until keyway depth is produced



The shims specified for standard depth keyways can be adjusted to suit particular applications



Extracts from BS.4235:Pt 1 1972

Metric Keyways

Keyway width B in hub is for a normal class fit to a tolerance Js9.

Note: Corner radii are not produced with standard broaches and for most applications this is acceptable. Where corner radii are required, single pass broaches must be modified. For multi pass broaches, an extra broach with corner radii is required and used for the final pass only.

Keyways for Square Parallel Keys

Shaft Nominal diameter		Key Size Section B x H	Keyway:		Width B Tolerance		Depth		Radius R		
over	incl		nom	Shaft (N9)	Hub (Js9)	Shaft T1 nom	tol	Hub T2 nom	tol	max	min
6	8	2 x 2	2	−0.004/−0.029	+0.012/−0.012	1.2	+0.1/0	1.0	+0.1/0	0.16	0.08
8	10	3 x 3	3	−0.004/−0.029	+0.012/−0.012	1.8	+0.1/0	1.4	+0.1/0	0.16	0.08
10	12	4 x 4	4	0/−0.030	+0.015/−0.015	2.5	+0.1/0	1.8	+0.1/0	0.16	0.08
12	17	5 x 5	5	0/−0.030	+0.015/−0.015	3.0	+0.1/0	2.3	+0.1/0	0.25	0.16
17	22	6 x 6	6	0/−0.030	+0.015/−0.015	3.5	+0.1/0	2.8	+0.1/0	0.25	0.16

Keyways for Rectangular Parallel Keys

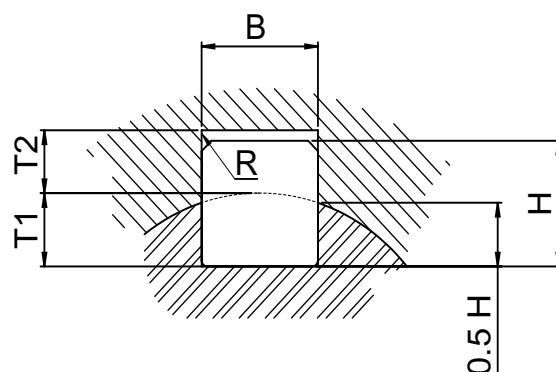
Shaft Nominal diameter		Key Size Section		Keyway:		Width B Tolerance		Depth		Radius R	
over	incl	B x H	nom	Shaft (N9)	Hub (Js9)	nom	tol	nom	tol	max	min
22	30	8 x 7	8	0/−0.036	+0.018/−0.018	4.0	+0.2/0	3.3	+0.2/0	0.25	0.16
30	38	10 x 8	10	0/−0.036	+0.018/−0.018	5.0	+0.2/0	3.3	+0.2/0	0.40	0.25
38	44	12 x 8	12	0/−0.043	+0.021/−0.021	5.0	+0.2/0	3.3	+0.2/0	0.40	0.25
44	50	14 x 9	14	0/−0.043	+0.021/−0.021	5.5	+0.2/0	3.8	+0.2/0	0.40	0.25
50	58	16 x 10	16	0/−0.043	+0.021/−0.021	6.0	+0.2/0	4.3	+0.2/0	0.40	0.25
58	65	18 x 11	18	0/−0.043	+0.021/−0.021	7.0	+0.2/0	4.4	+0.2/0	0.40	0.25
65	75	20 x 12	20	0/−0.052	+0.026/−0.026	7.5	+0.2/0	4.9	+0.2/0	0.60	0.40
75	85	22 x 14	22	0/−0.052	+0.026/−0.026	9.0	+0.2/0	5.4	+0.2/0	0.60	0.40
85	95	25 x 14	25	0/−0.052	+0.026/−0.026	9.0	+0.2/0	5.4	+0.2/0	0.60	0.40

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Extracts from BS.43-3:1951

Inch Keyways

Note: Corner radii are not produced with standard broaches and for most applications this is acceptable. Where corner radii are required, single pass broaches must be modified. For multi pass broaches, an extra broach with corner radii is required and used for the final pass only.



Keyways for Square Parallel Keys

Shaft Nominal diameter		Key Size Section B x H	Keyway:		Width B Tolerance		Depth		Radius R	
over	incl		nom		Shaft	Hub	Shaft T1 nom	Hub T2 tol	nom	tol
1/4	1/2	1/8 x 1/8	0.125		0/-0.001	+0.001/0	0.072	+0.006/0	0.060	+0.006/0
1/2	3/4	3/16 x 3/16	0.188		0/-0.001	+0.001/0	0.107	+0.006/0	0.088	+0.006/0
3/4	1	1/4 x 1/4	0.250		0/-0.001	+0.001/0	0.142	+0.006/0	0.115	+0.006/0
1	1 1/4	5/16 x 5/16	0.312		0/-0.001	+0.001/0	0.177	+0.006/0	0.142	+0.006/0
1 1/4	1 1/2	3/8 x 3/8	0.375		0/-0.001	+0.001/0	0.213	+0.006/0	0.169	+0.006/0
1 1/2	1 3/4	7/16 x 7/16	0.438		0/-0.001	+0.001/0	0.248	+0.006/0	0.197	+0.006/0
1 3/4	2	1/2 x 1/2	0.500		0/-0.001	+0.001/0	0.283	+0.006/0	0.224	+0.006/0
2	2 1/2	5/8 x 5/8	0.625		0/-0.001	+0.001/0	0.354	+0.006/0	0.278	+0.006/0
2 1/2	3	3/4 x 3/4	0.750		0/-0.001	+0.001/0	0.424	+0.006/0	0.333	+0.006/0
3	3 1/2	7/8 x 7/8	0.875		0/-0.001	+0.001/0	0.495	+0.006/0	0.387	+0.006/0
3 1/2	4	1 x 1	1.000		0/-0.001	+0.001/0	0.566	+0.006/0	0.442	+0.006/0

Keyways for Rectangular Parallel Keys

Shaft Nominal diameter		Key Size Section B x H	Keyway:		Width B Tolerance		Depth		Radius R	
over	incl		nom		Shaft	Hub	Shaft T1 nom	Hub T2 tol	nom	tol
1	1 1/4	5/16 x 1/4	0.312		0/-0.001	+0.001/0	0.146	+0.006/0	0.112	+0.006/0
1 1/4	1 1/2	3/8 x 1/4	0.375		0/-0.001	+0.001/0	0.150	+0.006/0	0.108	+0.006/0
1 1/2	1 3/4	7/16 x 5/16	0.438		0/-0.001	+0.001/0	0.186	+0.006/0	0.135	+0.006/0
1 3/4	2	1/2 x 5/16	0.500		0/-0.001	+0.001/0	0.190	+0.006/0	0.131	+0.006/0
2	2 1/2	5/8 x 7/16	0.625		0/-0.001	+0.001/0	0.260	+0.006/0	0.185	+0.006/0
2 1/2	3	3/4 x 1/2	0.750		0/-0.001	+0.001/0	0.299	+0.006/0	0.209	+0.006/0
3	3 1/2	7/8 x 5/8	0.875		0/-0.001	+0.001/0	0.370	+0.006/0	0.264	+0.006/0
3 1/2	4	1 x 3/4	1.000		0/-0.001	+0.001/0	0.441	+0.006/0	0.318	+0.006/0

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B1 = Nominal size of broach
 B2 = Keyway width/tolerance
 D = Guide/Bore diameter
 S = No. of shims x thickness
 All dimensions in mm



Each set supplied in a box

WDS 6001/6005

Marlco Keyway Broach Sets

Litecut Metric

* The backing shim supplied in Set No. 6005 is used on all passes. The other shims are placed behind this to protect them from high frictional loads.


These broach sets are available for parallel keyways

For individual broaches, guides and shims see WDS No 6021 to 6055

See Page 23-1 for Broaching Presses


Broach Set 6001

Consists of 3 broaches, 5 guides and 4 shims

B1	B2	D					S	 (kg)	Broach Style	WDS No.
2	2.000/2.012	6	7	8	10	12	1 x 0.25	0.92	L0	6001
3	3.000/3.012						1 x 0.50			
4	4.000/4.015						2 x 0.75			


Broach Set 6002

Consists of 4 broaches, 9 guides and 6 shims

B1	B2	D					S	 (kg)	Broach Style	WDS No.
4	4.000/4.015	12	14	16	18	20	1 x 0.25	3	L1	6002
5	5.000/5.015						1 x 0.50			
6	6.000/6.015						4 x 0.75			
8	8.000/8.018									


Broach Set 6003

Consists of 4 broaches, 8 guides, 7 shims and extension shank

B1	B2	D					S	 (kg)	Broach Style	WDS No.
8	8.000/8.018	30	32	35	38	40	1 x 0.25	12.80	L2	6003
10	10.000/10.018						1 x 0.50			
12	12.000/12.021						1 x 0.75			
14	14.000/14.021						4 x 1.25			


Broach Set 6004

Consists of 2 broaches, 6 guides, 6 shims and extension shank

B1	B2	D					S	 (kg)	Broach Style	WDS No.
16	16.000/16.021	52	55	58	60	62	1 x 0.75	17.30	L3	6004
18	18.000/18.021						2 x 0.50 3 x 1.25			

Broach Set 6005*

Consists of 2 broaches, 4 guides, 12 shims and extension shank

B1	B2	D					S	 (kg)	Broach Style	WDS No.
20	20.000/20.026	70	75	90	95		2 x 0.50 9 x 0.75	35	L4	6005
25	25.000/25.026						1 Backing Shim			

WDS 6011/6015

Marlco Keyway Broach Sets

Litecut Inch

* The backing shim supplied in Set No. 6015 is used on all passes. The other shims are placed behind this to protect them from high frictional loads.

These broach sets are available for parallel keyways

For individual broaches, guides and shims see WDS No 6061 to 6095

See Page 23-1 for Broaching Presses



Each set supplied in a box

B1 = Nominal size of broach
B2 = Keyway width/tolerance
D = Guide/Bore diameter
S = No. of shims x thickness
All dimensions in inches

Broach Set 6011 (Woodruff keyways - note tolerance B2)

Consists of 3 broaches, 5 guides and 3 shims

B1	B2	D					S	(kg)	Broach Style	WDS No.
1/16	0.063/0.065						1 x 0.01			
3/32	0.095/0.097	1/4	5/16	3/8	7/16	1/2	1 x 0.02	0.92	L0	6011
1/8	0.126/0.128						1 x 0.03			

Broach Set 6012

Consists of 4 broaches, 7 guides and 7 shims

B1	B2	D					S	(kg)	Broach Style	WDS No.
1/8	0.125/0.126						1 x 0.01			
3/16	0.188/0.189	1/2	5/8	3/4	7/8	1	1 x 0.02	3	L1	6012
1/4	0.250/0.251	1 1/8	1 1/4				5 x 0.03			
5/16	0.312/0.313									

Broach Set 6013

Consists of 4 broaches, 8 guides, 7 shims and extension shank

B1	B2	D					S	(kg)	Broach Style	WDS No.
5/16	0.312/0.313						1 x 0.01			
3/8	0.375/0.376	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 x 0.02	12.80	L2	6013
7/16	0.438/0.439	1 3/4	1 7/8	2			1 x 0.03			
1/2	0.500/0.501						4 x 0.05			

Broach Set 6014

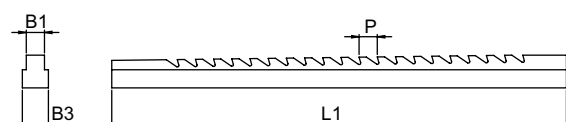
Consists of 2 broaches, 6 guides, 10 shims and extension shank

B1	B2	D					S	(kg)	Broach Style	WDS No.
5/8	0.625/ 0.626	2 1/8	2 1/4	2 3/8	2 1/2	2 3/4	1 x 0.03	17.30	L3	6014
3/4	0.750/ 0.751	3					2 x 0.02 7 x 0.05			

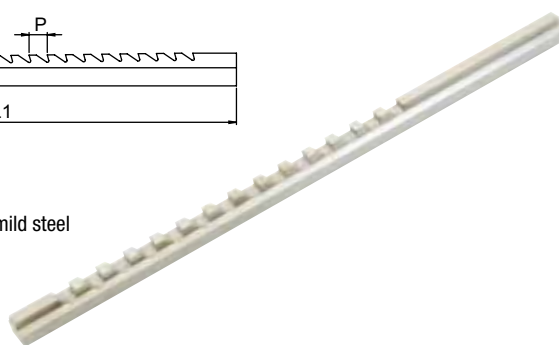
Broach Set 6015*

Consists of 2 broaches, 4 guides, 18 shims and extension shank

B1	B2	D					S	(kg)	Broach Style	WDS No.
7/8	0.875/0.876	3 1/4	3 1/2	3 3/4	4		2 x 0.02 15 x 0.03	35	L4	6015
1	1.000/1.001						1 Backing Shim			



B1 = Nominal size of broach
 B2 = Keyway width/tolerance
 B3 = Keyway broach body width
 F = Approx. load per tooth cutting mild steel
 L1 = O/all length of broach
 L2 = Length of cut
 P = Pitch of teeth
 R = No. of passes
 S = No. of shims x thickness
 T = Depth of keyway on centre line
 All dimensions in mm



WDS 6021/6025

Marlo Keyway Broaches

Litecut Metric

MATERIAL - M2 grade HSS

Broaches are supplied complete with the necessary shims to cut keyways to standard depth

Broach styles L2M, L3M and L4M require the use of an extension shank which should be ordered separately. See 6093 to 6095

* Broach style L4M requires a backing shim which should be ordered separately - see 6045-BS. The backing shim is placed in front of the other shims to protect them from high frictional loads.

See Page 23-1 for Broaching Presses

Broach Style L0M

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	(kg)	WDS No.
2	2.000/2.012	4.20	45	152	10.2	25.5	5.1	1	—	1.05	0.02	6021-202S
3	3.000/3.012	4.20	55	152	10.2	25.5	5.1	2	1 x 0.75	1.45	0.02	6021-203S
4	4.000/4.015	4.20	60	152	10.2	25.5	5.1	3	2 x 0.75	1.85	0.03	6021-204S

Broach Style L1M

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	(kg)	WDS No.
3	3.000/3.012	8.25	65	203	18.2	54	9.1	3	† 1 x 0.25 2 x 0.75	1.85	0.10	6022-203S
4	4.000/4.015	8.25	85	203	18.2	54	9.1	3	† 1 x 0.25 2 x 0.75	1.85	0.11	6022-204S
5	5.000/5.015	8.25	90	203	18.2	54	9.1	4	3 x 0.75	2.35	0.11	6022-205S
6	6.000/6.015	8.25	130	203	18.2	54	9.1	5	3 x 0.75 1 x 0.50	2.85	0.11	6022-206S
7	7.000/7.018	8.25	150	203	18.2	54	9.1	6	4 x 0.75 1 x 0.25	3.40	0.12	6022-207S
8	8.000/8.018	8.25	170	203	18.2	54	9.1	6	4 x 0.75 1 x 0.25	3.40	0.12	6022-208S

† Used for first pass of broach

Broach Style L2M

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	(kg)	WDS No.
6	6.000/6.015	14.30	150	305	31.8	104	15.9	4	2 x 1.25 1 x 0.75	3.40	0.70	6023-206S
8	8.000/8.018	14.30	200	305	31.8	104	15.9	4	2 x 1.25 1 x 0.75	3.40	0.70	6023-208S
10	10.000/10.018	14.30	250	305	31.8	104	15.9	4	2 x 1.25 1 x 0.75	3.40	0.74	6023-210S
12	12.000/12.021	14.30	300	305	31.8	104	15.9	4	2 x 1.25 1 x 0.75	3.40	0.76	6023-212S
14	14.000/14.021	14.30	350	305	31.8	104	15.9	4	3 x 1.25	3.90	0.76	6023-214S

Broach Style L3M

B1	B2	B3	F kg	T	L1	min	L2 max	P	R	S	T	(kg)	WDS No.
16	16.000/16.021	19.05	400	4.40	305	31.8	104	15.9	5	3 x 1.25 2 x 0.50	† 4.40	1.25	6024-216S
18	18.000/18.021	19.05	450	4.50	305	31.8	104	15.9	5	3 x 1.25 2 x 0.50	† 4.50	1.25	6024-218S

† Used together

Broach Style L4M*

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	(kg)	WDS No.
20	20.000/20.026	25.40	360	380	38	152	19.0	10	7 x 0.75 2 x 0.50	5.00	2.25	6025-220S
22	22.000/22.026	25.40	390	380	38	152	19.0	10	9 x 0.75	5.50	2.25	6025-222S
24	24.000/24.026	25.40	430	380	38	152	19.0	10	9 x 0.75	5.50	2.25	6025-224S
25	25.000/25.026	25.40	450	380	38	152	19.0	10	9 x 0.75	5.50	2.25	6025-225S

WDS 6031/6035

Marlco Keyway Broaching Guides Litecut Metric

MATERIAL -

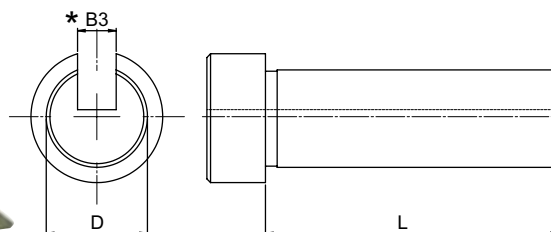
Steel (220M07)

Machined finish

All guides are headed

Guides listed are for parallel keyways


Parallel Guide




★ See relevant broach for B3 dimension

All dimensions in mm. Additional sizes can be supplied.


Guides

D	L	 (kg)	To suit broach style	WDS No.
6	32	0.01	L0M	6031-206
7	32	0.01	L0M	6031-207
8	32	0.01	L0M	6031-208
9	32	0.02	L0M	6031-209
10	32	0.02	L0M	6031-210
11	32	0.03	L0M	6031-211
12	32	0.03	L0M	6031-212
12	57	0.03	L1M	6032-212
14	57	0.03	L1M	6032-214
15	57	0.03	L1M	6032-215
16	57	0.05	L1M	6032-216
18	57	0.07	L1M	6032-218
19	57	0.08	L1M	6032-219
20	57	0.10	L1M	6032-220

Guides

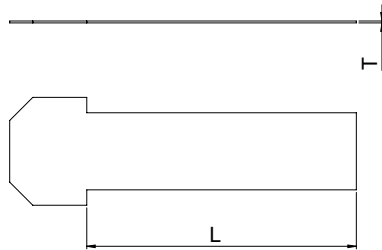
D	L	 (kg)	To suit broach style	WDS No.
22	57	0.14	L1M	6032-222
25	57	0.22	L1M	6032-225
28	57	0.28	L1M	6032-228
30	57	0.34	L1M	6032-230
28	108	0.16	L2M	6033-228
30	108	0.21	L2M	6033-230
32	108	0.28	L2M	6033-232
35	108	0.41	L2M	6033-235
38	108	0.56	L2M	6033-238
40	108	0.65	L2M	6033-240
42	108	0.80	L2M	6033-242
45	108	1.25	L2M	6033-245
48	108	1.41	L2M	6033-248
50	108	1.50	L2M	6033-250

Guides


D	L	 (kg)	To suit broach style	WDS No.
52	108	1.50	L3M	6034-252
55	108	1.75	L3M	6034-255
58	108	2	L3M	6034-258
60	108	2	L3M	6034-260
62	108	2.25	L3M	6034-262
65	108	2.50	L3M	6034-265
70	158	4	L4M	6035-270
75	158	4.5	L4M	6035-275
80	158	5.5	L4M	6035-280
85	158	6.5	L4M	6035-285
90	158	7	L4M	6035-290
95	158	10	L4M	6035-295

WDS 6041 - WDS 6045


Shims Litecut Metric



Shims

T	L	 (g)	To suit broach style	WDS No.
0.25	38	0.05	L0M	6041-2025
0.50	38	0.10	L0M	6041-2050
0.75	38	0.15	L0M	6041-2075
0.25	63	0.25	L1M	6042-2025
0.50	63	0.50	L1M	6042-2050
0.75	63	0.75	L1M	6042-2075
0.25	112	0.55	L2M	6043-2025
0.50	112	1.10	L2M	6043-2050
0.75	112	1.65	L2M	6043-2075

Shims


T	L	 (g)	To suit broach style	WDS No.
1.25	112	2.75	L2M	6043-2125
0.25	125	0.75	L3M	6044-2025
0.50	112	1.50	L3M	6044-2050
0.75	112	2.25	L3M	6044-2075
1.25	112	3.75	L3M	6044-2125
0.25	165	1.5	L4M	6045-2025
0.50	165	3	L4M	6045-2050
0.75	165	4.5	L4M	6045-2075
Backing	165	18	L4M	6045-BS

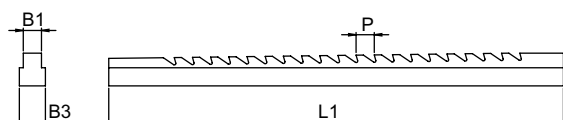
WDS 6093- WDS 6095

Extension Shanks



Extension shanks

L	 (g)	To suit broach style	WDS No.
115	105	L2M	6093-01
115	130	L3M	6094-01
165	350	L4M	6095-01



B1 = Nominal size of broach
 B2 = Keyway width/tolerance
 B3 = Keyway broach body width
 F = Approx. load per tooth cutting mild steel
 L1 = Overall length of broach
 L2 = Length of cut
 P = Pitch of teeth
 R = No. of passes
 S = No. of shims x thickness
 T = Depth of keyway on centre line
 All dimensions in inches

Additional sizes of broaches can be supplied

WDS 6061/6065

Marlco Keyway Broaches

Litecut Inch

MATERIAL -
M2 grade HSS

Broaches are supplied complete with the necessary shims to cut keyways to standard depth

Broach styles L2, L3 and L4 require the use of an extension shank which should be ordered separately. See 6093 to 6095

* Broach style L4 requires a backing shim which should be ordered separately - see 6085-BS. The backing shim is placed in front of the other shims to protect them from high frictional loads.

See Page 23-1 for Broaching Presses

Broach Style L0 (Woodruff keyways - note tolerance B2)

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	(kg)	WDS No.
1/16	0.063/0.065	5/32	36	6	0.40	1.00	0.20	1	—	0.045	0.02	6061-01S
3/32	0.095/0.097	5/32	54	6	0.40	1.00	0.20	2	1 x 0.02	0.060	0.02	6061-015S
1/8	0.126/0.128	5/32	70	6	0.40	1.00	0.20	3	1 x 0.03 1 x 0.01	0.075	0.03	6061-02S
5/32	0.156/0.157	5/32	86	6	0.40	1.00	0.20	3	1 x 0.03 1 x 0.01	0.075	0.03	6061-025S

Broach Style L1

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	(kg)	WDS No.
1/8	0.125/0.126	5/16	68	8	0.72	2.13	0.36	3	2 x 0.03	0.063	0.10	6062-02S
5/32	0.156/0.157	5/16	86	8	0.72	2.13	0.36	4	3 x 0.03	0.091	0.10	6062-025S
3/16	0.188/0.189	5/16	105	8	0.72	2.13	0.36	4	3 x 0.03	0.091	0.10	6062-03S
1/4	0.250/0.251	5/16	135	8	0.72	2.13	0.36	5	4 x 0.03	0.118	0.11	6062-04S
5/16	0.312/0.313	5/16	170	8	0.72	2.13	0.36	6	5 x 0.03	0.145	0.12	6062-05S

Broach Style L2

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	(kg)	WDS No.
5/16	0.312/0.313	9/16	200	12	1.25	4.13	0.63	4	2 x 0.05 1 x 0.03	0.145	0.72	6063-05S
3/8	0.375/0.376	9/16	240	12	1.25	4.13	0.63	4	3 x 0.05	0.172	0.72	6063-06S
7/16	0.438/0.439	9/16	280	12	1.25	4.13	0.63	5	3 x 0.05 1 x 0.03	0.200	0.75	6063-07S
1/2	0.500/0.501	9/16	320	12	1.25	4.13	0.63	6	4 x 0.05 1 x 0.02	0.227	0.75	6063-08S

Broach Style L3

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	(kg)	WDS No.
5/8	0.625/0.626	3/4	400	12	1.25	4.13	0.63	7	5 x 0.05 2 x 0.02 †	0.281	1.25	6064-10S
3/4	0.750/0.751	3/4	475	12	1.25	4.13	0.63	8	7 x 0.05	0.336	1.75	6064-12S

† Used together

Broach Style L4*

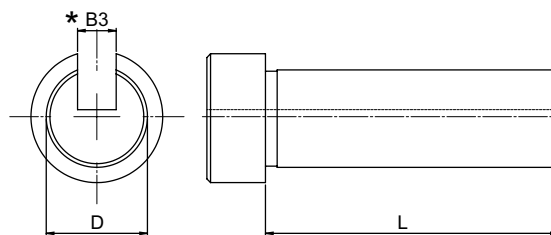
B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	(kg)	WDS No.
7/8	0.875/0.876	1	400	15	1.50	6.00	0.75	16	13 x 0.03 2 x 0.02	0.390	2.50	6065-14S
1	1.000/1.001	1	450	15	1.50	6.00	0.75	18	15 x 0.03 2 x 0.02	0.445	2.50	6065-16S

WDS 6071/6075

Marlco Keyway Broaching Guides Litecut Inch

MATERIAL -
Steel (220M07)
Machined finish
All guides are headed
Guides listed are for parallel keyways

Parallel Guide




★ See relevant broach for B3 dimension

All dimensions in Inches. Additional sizes can be supplied.


Guides

D	L	 (kg)	To suit broach style	WDS No.
1/4	1 1/4	0.01	L0	6071-04
5/16	1 1/4	0.01	L0	6071-05
3/8	1 1/4	0.02	L0	6071-06
7/16	1 1/4	0.03	L0	6071-07
1/2	1 1/4	0.03	L0	6071-08
1/2	2 1/4	0.03	L1	6072-08
9/16	2 1/4	0.03	L1	6072-09
5/8	2 1/4	0.05	L1	6072-10
3/4	2 1/4	0.09	L1	6072-12
7/8	2 1/4	0.15	L1	6072-14
1	2 1/4	0.22	L1	6072-16

Guides

D	L	 (kg)	To suit broach style	WDS No.
1 1/8	2 1/4	0.25	L1	6072-18
1 1/4	2 1/4	0.36	L1	6072-20
1 1/8	4 1/4	0.40	L2	6073-18
1 1/4	4 1/4	0.40	L2	6073-20
1 3/8	4 1/4	0.41	L2	6073-22
1 1/2	4 1/4	0.57	L2	6073-24
1 5/8	4 1/4	0.76	L2	6073-26
1 3/4	4 1/4	1	L2	6073-28
1 7/8	4 1/4	1.25	L2	6073-30
2	4 1/4	1.50	L2	6073-32
2 1/8	4 1/4	1.5	L3	6074-34

Guides


D	D1	 (kg)	To suit broach style	WDS No.
2 1/4	4 1/4	2	L3	6074-36
2 3/8	4 1/4	2	L3	6074-38
2 1/2	4 1/4	2.5	L3	6074-40
2 3/4	4 1/4	3	L3	6074-44
3	4 1/4	3.5	L3	6074-48
3 1/4	6 1/4	6	L4	6075-52
3 1/2	6 1/4	7	L4	6075-56
3 3/4	6 1/4	8.5	L4	6075-60
4	6 1/4	9.5	L4	6075-64

WDS 6081/6085


Shims Litecut Inch




Shims

T	L	 (g)	To suit broach style	WDS No.
0.01	1 1/2	0.05	L0	6081-01
0.02	1 1/2	0.10	L0	6081-02
0.03	1 1/2	0.15	L0	6081-03
0.01	2 1/2	0.25	L1	6082-01
0.02	2 1/2	0.50	L1	6082-02
0.03	2 1/2	0.75	L1	6082-03
0.01	4 1/2	0.55	L2	6083-01
0.02	4 1/2	1.10	L2	6083-02

Shims

T	L	 (g)	To suit broach style	WDS No.
0.03	4 1/2	1.65	L2	6083-03
0.05	4 1/2	2.75	L2	6083-05
0.01	4 1/2	0.75	L3	6084-01
0.02	4 1/2	1.50	L3	6084-02
0.03	4 1/2	2.25	L3	6084-03
0.05	4 1/2	3.75	L3	6084-05
0.02	6 1/2	3	L4	6085-02
0.03	6 1/2	4.5	L4	6085-03
Backing	6 1/2	18	L4	6085-BS

Extension shanks

L	 (g)	To suit broach style	WDS No.
4 1/2	105	L2	6093-01
4 1/2	130	L3	6094-01
6 1/2	350	L4	6095-01

WDS 6093/6095

Extension Shanks



B1 = Nominal size of broach
 B2 = Keyway width/tolerance
 D = Guide/Bore diameter
 S = No. of shims x thickness
 All dimensions in mm



Each set supplied in a box

WDS 6101/6104

Keyway Broach Sets Hevicut Metric


Broach styles H4M and H5M require the use of an extension shank which is not supplied

For individual broaches, guides and shims see WDS No 6121 to 6145

See Page 23-1 for Broaching Presses


Broach Set 6101 (Woodruff keyways - note tolerance B2)

Consists of 2 broaches, 5 guides and 1 shim

B1	B2	D					S	 (kg)	Broach Style	WDS No.
2	1.986/2.012	6	7	8	9	10	—	0.2	H1M	6101
3	2.987/3.012						1 x 0.78			


Broach Set 6102

Consists of 4 broaches, 9 guides and 4 shims

B1	B2	D					S	 (kg)	Broach Style	WDS No.
4	3.988/4.013	12	14	16			1 x 0.97	3.3	H2M	6102
5	4.986/5.011						1 x 1.27			
6	5.987/6.012	18	20	22	25	28	1 x 1.45		H3M	
8	7.988/8.014						1 x 1.88			


Broach Set 6103

Consists of 3 broaches, 8 guides and 6 shims

B1	B2	D					S	 (kg)	Broach Style	WDS No.
10	9.987/10.013	32	35	38	40	42	2 x 1.42	12.8	H4M	6103
12	11.989/12.014	48	50				2 x 1.52			
14	13.993/14.018						2 x 1.78			

Broach Set 6104

Consists of 2 broaches, 6 guides and 6 shims

B1	B2	D					S	 (kg)	Broach Style	WDS No.
16	15.992/16.017	52	55	58	60	62	3 x 1.55	32	H5M	6104
18	17.991/18.016						3 x 1.59			

WDS 6111/6114

Keyway Broach Sets

Hevicut Inch

Broach styles H4 and H5 require the use of an extension shank which is not supplied

For individual broaches, guides and shims see WDS No 6161 to 6185

See Page 23-1 for Broaching Presses




Each set supplied in a box

B1 = Nominal size of broach
B2 = Keyway width/tolerance
D = Guide/Bore diameter
S = No. of shims x thickness
All dimensions in inches


Broach Set 6111 (Woodruff keyways - note tolerance B2)

Consists of 3 broaches, 5 guides and 3 shims

B1	B2	D						S	 (kg)	Broach Style	WDS No.
1/16	0.0625/0.0635	1/4	5/16	3/8	7/16	1/2		1 x 0.025	0.2	H1	6111
3/32	0.0932/0.0947							1 x 0.033			
1/8	0.1250/ 0.1262							1 x 0.042			


Broach Set 6112

Consists of 4 broaches, 9 guides and 5 shims

B1		B2		D						S	 (kg)	Broach Style	WDS No.
1/8	0.1252/0.1262	1/2	5/8	3/4					1 x 0.031	3.5	H2	6112	
3/16	0.1877/0.1887								1 x 0.050				
1/4	0.2502/0.2512	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 x 0.062	H3				
3/8	0.3755/0.3765							2 x 0.062					


Broach Set 6113

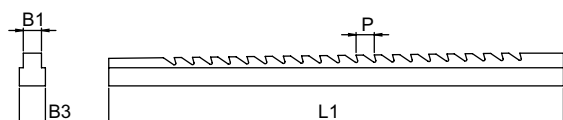
Consists of 3 broaches, 5 guides and 7 shims

B1	B2	D						S	 (kg)	Broach Style	WDS No.
3/8	0.3755/0.3765	1 1/2	1 5/8	1 3/4	1 7/8	2		2 x 0.062	13	H4	6113
7/16	0.4380/0.4390							2 x 0.075			
1/2	0.5006/0.5016							3 x 0.062			

Broach Set 6114

Consists of 2 broaches, 6 guides and 9 shims


B1	B2	D						S	 (kg)	Broach Style	WDS No.
5/8	0.6260/0.6270	2 3/8	2 1/2	2 5/8	2 3/4	2 7/8	3	4 x 0.062	40	H5	6114
3/4	0.7515/0.7525							5 x 0.062			




- B1 = Nominal size of broach
 B2 = Keyway width/tolerance
 B3 = Keyway broach body width
 F = Approx. load per tooth cutting mild steel
 L1 = O/all length of broach
 L2 = Length of cut
 P = Pitch of teeth
 R = No. of passes
 S = No. of shims x thickness
 T = Depth of keyway on centre line
 All dimensions in mm

Additional sizes of broaches can be supplied


Broach Style H1M

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	 (kg)	WDS No.
2	1.986/2.012	3.20	43	133	10.2	28.5	5.1	1	—	1.05	0.02	6121-202
3	2.987/3.012	3.20	34	133	10.2	28.5	5.1	2	1 x 0.78	1.45	0.02	6121-203


Broach Style H2M

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	 (kg)	WDS No.
4	3.988/4.013	6.35	100	178	15.2	42.8	7.6	2	1 x 0.97	1.85	0.09	6122-204
5	4.986/5.011	6.35	125	178	15.2	42.8	7.6	2	1 x 1.27	2.35	0.10	6122-205


Broach Style H3M

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	 (kg)	WDS No.
5	4.986/5.011	9.50	110	302	20.4	63.5	10.2	2	1 x 1.20	2.35	0.20	6123-205
6	5.987/6.012	9.50	130	302	20.4	63.5	10.2	2	1 x 1.45	2.85	0.22	6123-206
8	7.988/8.014	9.50	230	302	20.4	63.5	10.2	2	1 x 1.88	3.40	0.25	6123-208

Broach Style H4M

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	 (kg)	WDS No.
10	9.987/10.013	14.30	220	340	28.6	140	14.3	3	2 x 1.42	3.40	0.90	6124-210
12	11.989/12.014	14.30	345	340	28.6	140	14.3	3	2 x 1.52	3.40	0.93	6124-212
14	13.993/14.018	14.30	450	340	28.6	140	14.3	3	2 x 1.78	3.90	0.96	6124-214

Broach Style H5M

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	 (kg)	WDS No.
16	15.992/16.017	19.05	450	387	28.6	140	14.3	4	3 x 1.55	4.40	1.40	6125-216
18	17.991/18.016	19.05	500	387	28.6	140	14.3	4	3 x 1.59	4.50	1.50	6125-218

WDS 6121/6125

Marlco Keyway Broaches

Hevicut Metric

MATERIAL -
M2 grade HSS

Broaches are supplied complete with the necessary shims to cut keyways to standard depth
Broach styles H4M and H5M require the use of an extension shank which is not supplied

See Page 23-1 for Broaching Presses

WDS 6131/6135

Keyway Broaching Guides Hevicut Metric

MATERIAL -

Steel (220 M07) Machined finish

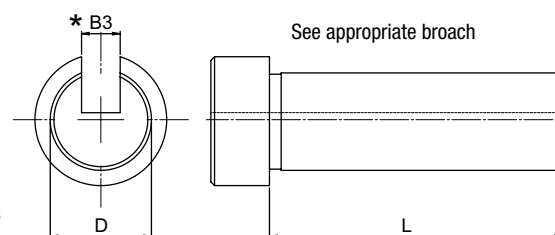
Guides for broach styles H1M, H2M & H3M are headed

Guides for broach styles H4M & H5M are plain

All dimensions in mm. Additional sizes can be supplied.




H4M, H5M Plain Guide




★ See relevant broach for B3 dimension

H1M, H2M, H3M Headed Guide


Guides

D	L	 (kg)	To suit broach style	WDS No.
6	24	0.01	H1M	6131-206
7	24	0.01	H1M	6131-207
8	24	0.01	H1M	6131-208
9	24	0.02	H1M	6131-209
10	24	0.02	H1M	6131-210
11	38	0.03	H2M	6132-211
12	38	0.03	H2M	6132-212
14	38	0.04	H2M	6132-214
16	38	0.04	H2M	6132-216
18	57	0.08	H3M	6133-218

Guides

D	L	 (kg)	To suit broach style	WDS No.
20	57	0.09	H3M	6133-220
22	57	0.15	H3M	6133-222
25	57	0.22	H3M	6133-225
28	57	0.25	H3M	6133-228
30	57	0.30	H3M	6133-230
32	102	0.37	H4M	6134-232
35	102	0.45	H4M	6134-235
38	102	0.63	H4M	6134-238
40	102	0.70	H4M	6134-240
42	102	0.75	H4M	6134-242

Guides

D	L	 (kg)	To suit broach style	WDS No.
45	127	0.96	H4M	6134-245
48	127	1.25	H4M	6134-248
50	127	1.60	H4M	6134-250
52	127	1.80	H5M	6135-252
55	127	1.95	H5M	6135-255
58	127	2.16	H5M	6135-258
60	153	2.83	H5M	6135-260
62	153	3.10	H5M	6135-262
65	153	3.40	H5M	6135-265


WDS 6141/6145

Shims - Hevicut Metric

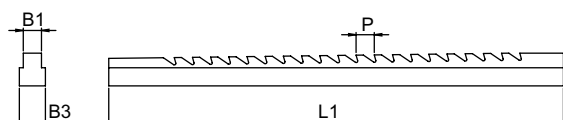
MATERIAL -

C1010

Shims

T	L	 (g)	To suit broach style	WDS No.
0.78	32	0.3	H1M	6141-2078
0.97	45	0.5	H2M	6142-2097
1.27	45	0.7	H2M	6142-2127
1.20	67	1.0	H3M	6143-2120
1.45	67	1.3	H3M	6143-2145
1.88	67	1.5	H3M	6143-2188
1.42	158	3.0	H4M	6144-2142
1.52	158	3.2	H4M	6144-2152
1.78	158	3.5	H4M	6144-2178
1.55	172	3.8	H5M	6145-2155
1.59	172	4.0	H5M	6145-2159





B1 = Nominal size of broach
 B2 = Keyway width/tolerance
 B3 = Keyway broach body width
 F = Approx. load per tooth cutting mild steel
 L1 = O/all length of broach
 L2 = Length of cut
 P = Pitch of teeth
 R = No. of passes
 S = No. of shims x thickness
 T = Depth of keyway on centre line
 All dimensions in inches



WDS 6161/6165

Keyway Broaches

Hevicut Inch

MATERIAL -
M2 grade HSS

Broaches are supplied complete with the necessary shims to cut keyways to standard depth
 Broach styles H4 and H5 require the use of an extension shank which is not supplied

See Page 23-1 for Broaching Presses

Additional sizes of broaches can be supplied

Broach Style H1 (Woodruff keyway/slot - note tolerance B2)

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	(kg)	WDS No.
1/16	0.0625/0.0635	1/8	23	5 1/4	0.40	1.12	0.20	2	1 x 0.025	0.045	0.02	6161-01
3/32	0.0932/0.0947	1/8	52	5 1/4	0.40	1.12	0.20	2	1 x 0.033	0.060	0.02	6161-015
1/8	0.1250/0.1262	1/8	52	5 1/4	0.40	1.12	0.20	2	1 x 0.042	0.075	0.02	6161-02

Broach Style H2

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	(kg)	WDS No.
3/32	0.0937/0.0947	3/16	60	7	0.60	1.68	0.30	1	—	0.047	0.04	6162-015
1/8	0.1252/0.1262	3/16	56	7	0.60	1.68	0.30	2	1 x 0.031	0.063	0.05	6162-02
3/16	0.1877/0.1887	3/16	130	7	0.60	1.68	0.30	2	1 x 0.050	0.091	0.07	6162-03

Broach Style H3

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	(kg)	WDS No.
3/16	0.1877/0.1887	3/8	130	11 7/8	0.80	2.50	0.40	2	1 x 0.050	0.091	0.25	6163-03
1/4	0.2502/0.2512	3/8	145	11 7/8	0.80	2.50	0.40	2	1 x 0.062	0.118	0.30	6163-04
5/16	0.3127/0.3137	3/8	225	11 7/8	0.80	2.50	0.40	2	1 x 0.078	0.145	0.35	6163-05
3/8	0.3755/0.3765	3/8	200	11 7/8	0.80	2.50	0.40	3	2 x 0.062	0.172	0.40	6163-06

Broach Style H4

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	(kg)	WDS No.
5/16	0.3127/0.3137	9/16	310	13 3/8	1.12	5.50	0.56	2	1 x 0.078	0.145	0.80	6164-05
3/8	0.3755/0.3765	9/16	270	13 3/8	1.12	5.50	0.56	3	2 x 0.062	0.172	0.83	6164-06
7/16	0.4380/0.4390	9/16	360	13 3/8	1.12	5.50	0.56	3	2 x 0.075	0.200	0.87	6164-07
1/2	0.5006/0.5016	9/16	380	13 3/8	1.12	5.50	0.56	4	3 x 0.062	0.227	0.90	6164-08

Broach Style H5

B1	B2	B3	F kg	L1	min	L2 max	P	R	S	T	(kg)	WDS No.
5/8	0.6260/0.6270	3/4	400	15 1/4	1.12	5.50	0.56	5	4 x 0.062	0.281	1.39	6165-10
3/4	0.7515/0.7525	3/4	410	15 1/4	1.12	5.50	0.56	6	5 x 0.062	0.336	1.47	6165-12

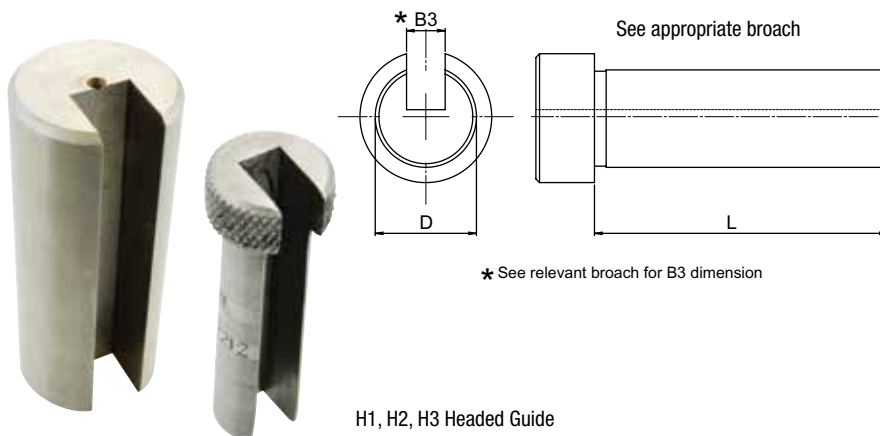
WDS 6171/6175

Keyway Broaching Guides Hevicut Inch

MATERIAL -
Steel (220M07) Machined finish
Guides for broach styles
H1, H2 & H3 are headed
Guides for broach styles
H4 & H5 are plain


All dimensions in inches.
Additional sizes can be supplied.

H4, H5 Plain Guide




H1, H2, H3 Headed Guide


Guides

D	L	 (kg)	To suit broach style	WDS No.
1/4	15/16	0.01	H1	6171-04
5/16	15/16	0.01	H1	6171-05
3/8	15/16	0.02	H1	6171-06
7/16	15/16	0.03	H1	6171-07
1/2	15/16	0.03	H1	6171-08
1/2	1 1/2	0.03	H2	6172-08
9/16	1 1/2	0.04	H2	6172-09
5/8	1 1/2	0.04	H2	6172-10
3/4	1 1/2	0.05	H2	6172-12

Guides

D	L	 (kg)	To suit broach style	WDS No.
3/4	2 1/4	0.09	H3	6173-12
7/8	2 1/4	0.15	H3	6173-14
1	2 1/4	0.22	H3	6173-16
1 1/8	2 1/4	0.25	H3	6173-18
1 1/4	2 1/4	0.27	H3	6173-20
1 3/8	2 1/4	0.30	H3	6173-22
1 1/2	2 1/4	0.33	H3	6173-24
1 1/2	4	0.63	H4	6174-24
1 5/8	4	0.70	H4	6174-26

Guides


D	L	 (kg)	To suit broach style	WDS No.
1 3/4	4	0.85	H4	6174-28
1 7/8	5	1.25	H4	6174-30
2	5	1.60	H4	6174-32
2 3/8	6	2.83	H5	6175-38
2 1/2	6	3.20	H5	6175-40
2 5/8	6	3.45	H5	6175-42
2 3/4	6	3.75	H5	6175-44
2 7/8	6	3.95	H5	6175-46
3	6	4.25	H5	6175-48

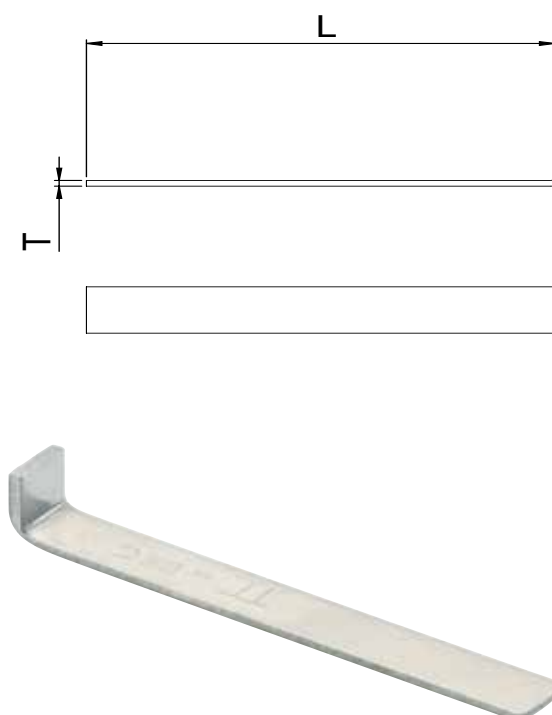
WDS 6181/6185

Shims

MATERIAL -
C1010

Shims

T	L	 (kg)	To suit broach style	WDS No.
0.025	1 1/4	0.3	H1	6181-025
0.033	1 1/4	0.3	H1	6181-033
0.042	1 1/4	0.4	H1	6181-042
0.031	1 3/4	0.4	H2	6182-031
0.050	1 3/4	0.7	H2	6182-050
0.050	2 5/8	1.0	H3	6183-050
0.062	2 5/8	1.3	H3	6183-062
0.078	2 5/8	1.5	H3	6183-078
0.062	6 1/4	3.1	H4	6184-062
0.075	6 1/4	3.5	H4	6184-075
0.078	6 1/4	3.6	H4	6184-078
0.062	6 3/4	3.8	H5	6185-062



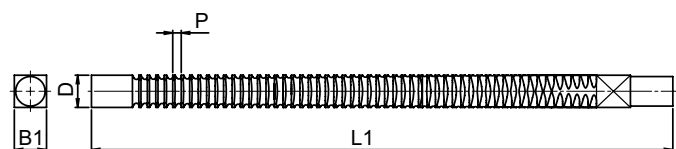
WDS 6421/6431

Marlco Square Push Broaches - Metric and Inch - Form A

MATERIAL -
M2 grade HSS

For Form 'A' a set of 2 broaches is required (except $\frac{3}{16}$ ")

See Page 23-1 for Broaching Presses



- B1 = Nominal size A/F & pilot dia. for Form 'A'
 B2 = Tolerance A/F
 D = Pilot dia. for form 'B'
 F = Approx. load per tooth, cutting mild steel
 L1 = O/all length of broach
 L2 = Length of cut
 P = Pitch of teeth
 R = No of broaches in set for Form 'A'




Broaching Instructions



Form A

1. Drill pilot hole as shown in column B1
2. Use set of 2 broaches (single broach for $\frac{3}{16}$ ")

Metric

B1	B2	D	L1	min	L2	max	P	R	F kg	 (kg)	WDS No. Set Form A
4	4.000/4.018	4.25	105	8.0	15	4.0	2	62	0.09	6421-204	
5	5.000/ 5.018	5.25	134	9.2	17	4.6	2	72	0.10	6421-205	
6	6.000/ 6.018	6.6	134	9.2	25	4.6	2	82	0.11	6421-206	
7	7.000/ 7.022	7.7	146	9.2	25	4.6	2	105	0.12	6421-207	
8	8.000/ 8.022	8.8	160	9.2	27	4.6	2	145	0.14	6421-208	
9	9.000/ 9.022	9.8	172	9.2	27	4.6	2	170	0.16	6421-209	
10	10.000/10.027	10.8	184	9.2	30	4.6	2	200	0.18	6421-210	
11	11.000/11.027	11.8	184	9.2	30	4.6	2	230	0.22	6421-211	
12	12.000/12.027	12.8	235	12.2	35	6.1	2	260	0.25	6421-212	
13	13.000/13.027	14.0	240	12.2	35	6.1	2	340	0.30	6421-213	
14	14.000/14.027	15.0	248	12.2	35	6.1	2	360	0.62	6421-214	
15	15.000/15.027	16.5	260	12.2	41	6.1	2	370	0.65	6421-215	
16	16.000/16.027	17.5	267	12.2	41	6.1	2	385	0.73	6421-216	
17	17.000/17.027	18.5	292	12.2	44	6.1	2	390	0.80	6421-217	
18	18.000/18.033	19.5	343	12.2	44	6.1	2	400	0.85	6421-218	
19	19.000/19.033	20.5	343	12.2	44	6.1	2	420	0.95	6421-219	

Inch

B1	B2	D	L1	min	L2	max	P	R	F kg	 (kg)	WDS No. Set Form A
$\frac{3}{16}$	0.1885/0.1895	n/a	5 $\frac{1}{4}$	$\frac{5}{16}$	$\frac{5}{8}$	0.16	1	80	0.10	6431-03	
$\frac{1}{4}$	0.2510/0.2520	$\frac{9}{32}$	5 $\frac{3}{8}$	$\frac{23}{64}$	1	0.18	2	110	0.12	6431-04	
$\frac{5}{16}$	0.3135/0.3145	$\frac{11}{32}$	6 $\frac{3}{8}$	$\frac{23}{64}$	1 $\frac{1}{6}$	0.18	2	145	0.14	6431-05	
$\frac{3}{8}$	0.3760/0.3770	$\frac{13}{32}$	7	$\frac{23}{64}$	1 $\frac{3}{16}$	0.18	2	180	0.18	6431-06	
$\frac{7}{16}$	0.4385/0.4395	$\frac{15}{32}$	7 $\frac{5}{8}$	$\frac{23}{64}$	1 $\frac{3}{16}$	0.18	2	240	0.23	6431-07	
$\frac{1}{2}$	0.5010/0.5020	$\frac{17}{32}$	9 $\frac{1}{2}$	$\frac{31}{64}$	1 $\frac{3}{8}$	0.24	2	340	0.28	6431-08	
$\frac{9}{16}$	0.5645/0.5655	$\frac{19}{32}$	9 $\frac{3}{4}$	$\frac{31}{64}$	1 $\frac{3}{8}$	0.24	2	360	0.62	6431-09	
$\frac{5}{8}$	0.6270/0.6280	$\frac{11}{16}$	10 $\frac{3}{8}$	$\frac{31}{64}$	1 $\frac{5}{8}$	0.24	2	370	0.73	6431-10	
$\frac{11}{16}$	0.6895/0.6905	$\frac{3}{4}$	13 $\frac{1}{2}$	$\frac{31}{64}$	1 $\frac{5}{8}$	0.24	2	410	0.82	6431-11	
$\frac{3}{4}$	0.7525/0.7535	$\frac{13}{16}$	13 $\frac{5}{8}$	$\frac{31}{64}$	1 $\frac{3}{4}$	0.24	2	420	0.95	6431-12	

WDS 6421/6431

Marlco Square Push Broaches - Metric and Inch - Form B

MATERIAL - M2 grade HSS

For Form 'B' a single Broach can be used which is, in fact, the 2nd stage broach from the set of 2. To order a 1st or 2nd stage broach from a 2 stage set add suffix /1 or /2 to the set No.

Figures given in the weight column refer to single broach only

B1 = Nominal size A/F & pilot dia. for Form 'A'

B2 = Tolerance A/F

D = Pilot dia. for form 'B'

F = Approx. load per tooth, cutting mild steel

L1 = O/all length of broach

L2 = Length of cut

P = Pitch of teeth

R = No of broaches in set for Form 'A'

See Page 23-1 for Broaching Presses

Broaching Instructions




1. Drill pilot hole as shown in column D


2. Use single broach (not applicable for 3/16")

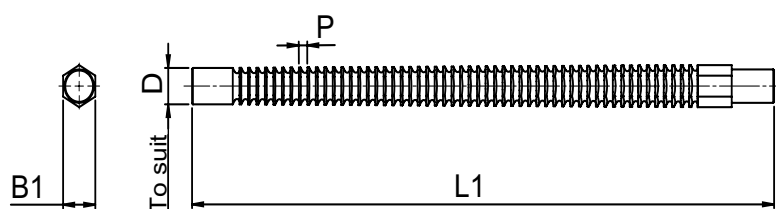
Form B

Metric

B1	B2	D	L1	min	L2 max	P	R	F kg	 (kg)	WDS No. Form B
4	4.000/4.018	4.25	105	8.0	15	4.0	2	62	0.09	6421-204/2
5	5.000/ 5.018	5.25	134	9.2	17	4.6	2	72	0.10	6421-205/2
6	6.000/ 6.018	6.6	134	9.2	25	4.6	2	82	0.11	6421-206/2
7	7.000/ 7.022	7.7	146	9.2	25	4.6	2	105	0.12	6421-207/2
8	8.000/ 8.022	8.8	160	9.2	27	4.6	2	145	0.14	6421-208/2
9	9.000/ 9.022	9.8	172	9.2	27	4.6	2	170	0.16	6421-209/2
10	10.000/10.027	10.8	184	9.2	30	4.6	2	200	0.18	6421-210/2
11	11.000/11.027	11.8	184	9.2	30	4.6	2	230	0.22	6421-211/2
12	12.000/12.027	12.8	235	12.2	35	6.1	2	260	0.25	6421-212/2
13	13.000/13.027	14.0	240	12.2	35	6.1	2	340	0.30	6421-213/2
14	14.000/14.027	15.0	248	12.2	35	6.1	2	360	0.62	6421-214/2
15	15.000/15.027	16.5	260	12.2	41	6.1	2	370	0.65	6421-215/2
16	16.000/16.027	17.5	267	12.2	41	6.1	2	385	0.73	6421-216/2
17	17.000/17.027	18.5	292	12.2	44	6.1	2	390	0.80	6421-217/2
18	18.000/18.033	19.5	343	12.2	44	6.1	2	400	0.85	6421-218/2
19	19.000/19.033	20.5	343	12.2	44	6.1	2	420	0.95	6421-219/2

Inch

B1	B2	D	L1	min	L2 max	P	R	F kg	 (kg)	WDS No. Form B
1/4	0.2510/0.2520	9/32	5 3/8	23/64	1	0.18	2	110	0.12	6431-04/2
5/16	0.3135/0.3145	11/32	6 3/8	23/64	1 1/16	0.18	2	145	0.14	6431-05/2
3/8	0.3760/0.3770	13/32	7	23/64	1 3/16	0.18	2	180	0.18	6431-06/2
7/16	0.4385/0.4395	15/32	7 5/8	23/64	1 3/16	0.18	2	240	0.23	6431-07/2
1/2	0.5010/0.5020	17/32	9 1/2	31/64	1 3/8	0.24	2	340	0.28	6431-08/2
9/16	0.5645/0.5655	19/32	9 3/4	31/64	1 3/8	0.24	2	360	0.62	6431-09/2
5/8	0.6270/0.6280	11/16	10 3/8	31/64	1 5/8	0.24	2	370	0.73	6431-10/2
11/16	0.6895/0.6905	3/4	13 1/2	31/64	1 5/8	0.24	2	410	0.82	6431-11/2
3/4	0.7525/0.7535	13/16	13 5/8	31/64	1 3/4	0.24	2	420	0.95	6431-12/2



WDS 6441/6451

Marlo Hexagon Push Broaches

- Metric and Inch

MATERIAL -
M2 grade HSS


B1 = Nominal size A/F¹
 B2 = Tolerance A/F
 D = Pilot dia. for drill size
 F = Approx. load per tooth, cutting mild steel
 L1 = O/all length of broach
 L2 = Length of cut
 P = Pitch of teeth

See Page 23-1 for Broaching Presses

Metric

B1	B2	D	L1	min	L2	max	P	F kg	 (kg)	WDS No.
5	5.013/ 5.038	5	127	8	16		4.0	55	0.10	6441-205
6	6.013/ 6.038	6	146	9.5	22		4.8	85	0.13	6441-206
7	7.013/ 7.038	7	152	9.5	22		4.8	100	0.14	6441-207
8	8.013/ 8.038	8	172	10	25		5.1	120	0.16	6441-208
9	9.013/ 9.038	9	190	11	32		5.6	130	0.20	6441-209
10	10.013/10.038	10	197	11	32		5.6	150	0.23	6441-210
11	11.026/11.051	11	254	12.7	38		6.4	165	0.50	6441-211
12	12.026/12.051	12	267	12.7	38		6.4	200	0.55	6441-212
13	13.026/13.051	13	267	12.7	38		6.4	230	0.60	6441-213
14	14.026/14.051	14	310	14	42		7.1	245	0.65	6441-214
15	15.026/15.051	15	330	14	42		7.1	275	0.75	6441-215
16	16.026/16.051	16	350	15	45		7.6	300	0.84	6441-216
17	17.026/17.051	17	350	15	45		7.6	330	0.90	6441-217
18	18.026/18.051	18	375	16	57		8.1	370	1.00	6441-218
19	19.038/19.064	19	380	16	57		8.1	400	1.25	6441-219

Inch

B1	B2	D	L1	min	L2	max	P	F kg	 (kg)	WDS No.
$\frac{3}{16}$	0.1880/0.1890	$\frac{3}{16}$	4 $\frac{1}{2}$	$\frac{5}{16}$	$\frac{5}{8}$		0.16	60	0.10	6451-03
$\frac{1}{4}$	0.2505/0.2515	$\frac{1}{4}$	5 $\frac{3}{4}$	$\frac{3}{8}$	$\frac{7}{8}$		0.19	85	0.13	6451-04
$\frac{5}{16}$	0.3130/0.3140	$\frac{5}{16}$	6 $\frac{3}{4}$	$\frac{25}{64}$	1		0.20	120	0.16	6451-05
$\frac{3}{8}$	0.3755/0.3765	$\frac{3}{8}$	7 $\frac{3}{4}$	$\frac{7}{16}$	1 $\frac{1}{4}$		0.22	150	0.22	6451-06
$\frac{7}{16}$	0.4385/0.4395	$\frac{7}{16}$	10	$\frac{1}{2}$	1 $\frac{1}{2}$		0.25	170	0.52	6451-07
$\frac{1}{2}$	0.5010/0.5020	$\frac{1}{2}$	10 $\frac{1}{2}$	$\frac{1}{2}$	1 $\frac{1}{2}$		0.25	220	0.58	6451-08
$\frac{9}{16}$	0.5635/0.5645	$\frac{9}{16}$	12 $\frac{1}{4}$	$\frac{9}{16}$	1 $\frac{5}{8}$		0.28	250	0.76	6451-09
$\frac{5}{8}$	0.6260/0.6270	$\frac{5}{8}$	13 $\frac{3}{4}$	$\frac{19}{32}$	1 $\frac{3}{4}$		0.30	340	0.80	6451-10
$1\frac{1}{16}$	0.6885/0.6895	$1\frac{1}{16}$	13 $\frac{3}{4}$	$\frac{19}{32}$	1 $\frac{3}{4}$		0.30	360	0.90	6451-11
$\frac{3}{4}$	0.7515/0.7525	$\frac{3}{4}$	15	$\frac{41}{64}$	2 $\frac{1}{4}$		0.32	440	1.00	6451-12

WDS 6110

Broaching Oil

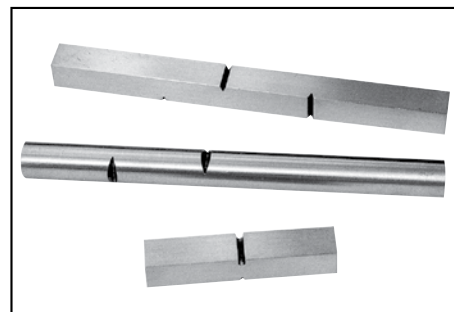
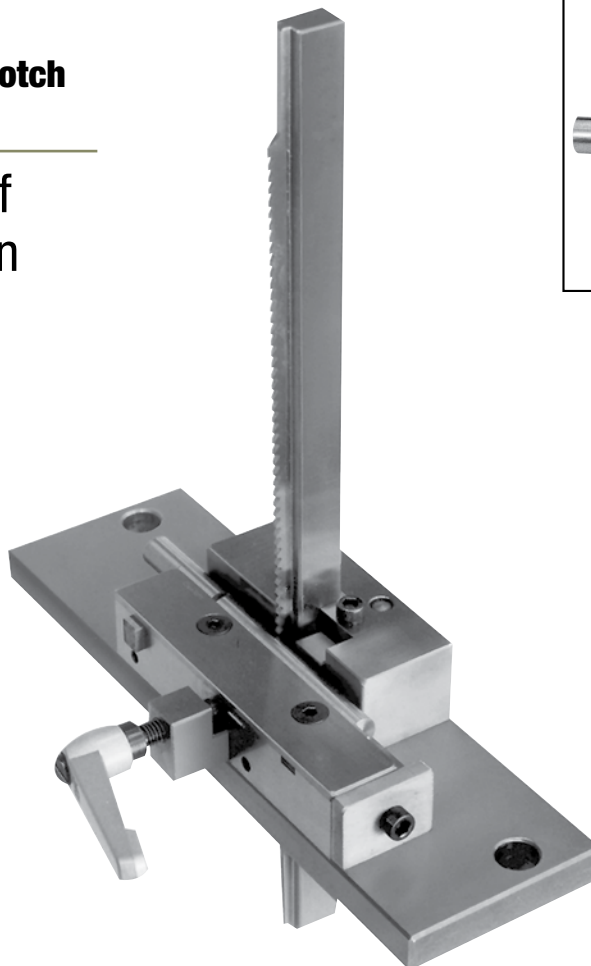


Description	 (kg)	WDS No.
Broaching Oil - 1 Litre	1	6110-201

WDS 6481

Marlco Izod and Charpy Notch Broaching Equipment

For the production of 'V' and 'U' notches in **IZOD** and **CHARPY** impact test pieces



**Dramatic Cost Reduction
compared to conventional machining methods**

Please refer to Page 27-20 for broaches

WDS 6482

Marlco Izod and Charpy Notch Broaching Equipment

MATERIAL -
PM-M4 Hss

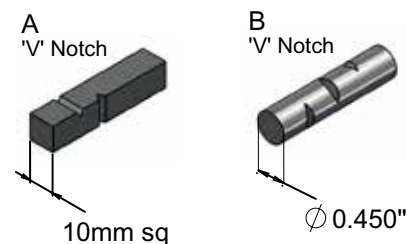
Notches produced with this equipment conform to BS.131 pt.1, DIN 50115, EN10 045-1 and most recognised standards.

The simplest accurate method for the production of Izod and Charpy notches.

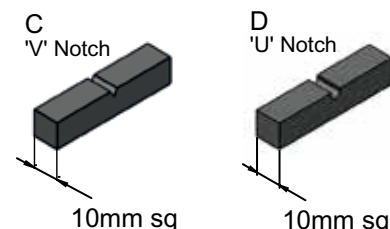
All you need is the fixture, an appropriate broach, a suitable press and a couple of minutes.

- Suitable for ferrous and non-ferrous materials
- Common fixture accommodates 7 interchangeable broaches
- Can be used on any suitable arbor press. Marlco Press 6501BP is ideal
- Load requirement is only 180kg (400lb) on material with UTS of 1.2 kN/sq. mm (75 tons/sq. in.)
- Broach regrind service available
- Always use a suitable cutting oil for broaching
- Fixture Weight = 4kg

Izod



Charpy



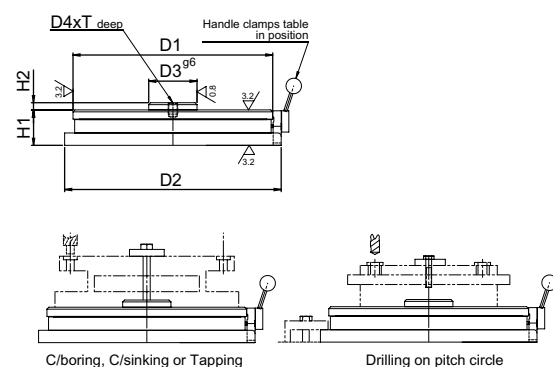
Notch broaching on a Marlco 6501 press.
No operator setting or adjustment.

All dimensions in mm.

Test	Test Piece	Notch Form	Notch Depth	O/all Length Of Broach	(kg)	Broaches WDS No.	Fixure WDS No.
Izod	A	V	2mm	356mm	0.75	6482-201B	6481
Izod	B	V	0.13"	356mm	0.75	6482-201B	6481
Charpy	C	V	2mm	356mm	0.75	6482-201B	6481
Izod	A	V	2mm	241mm	0.50	6482-202B	6481
Charpy	C	V	2mm	241mm	0.50	6482-202B	6481
*Charpy	D	U	5mm	394mm	0.82	6482-203B	6481
*Charpy	D	U	5mm	394mm	1.62	Set 6482-204B	6481
DVM	D	U	3mm	394mm	0.81	6482-205B	6481
Mesnager	D	U	2mm	311mm	0.62	6482-206B	6481
VSM	D	U	2.5mm	311mm	0.62	6482-207B	6481

* The cut per tooth on broach number 6482-203B is higher than average due to the required notch depth.

If problems are experienced when notching higher tensile materials, then a set of 2 broaches is available as an alternative - broach set 6842-2041B and second stage 6482-2042B.



WDS 6786

Plain Rotating Base

MATERIAL -
Base and top plate - Cast iron
Spindle and bush - steel hardened and ground.

The top plate rotates on a ring of balls.
Blind holes may be tapped to a maximum depth of 16mm in the top plate.

Nuts- Metric

D1	D2	D3 ^{g6}	D4	H1	H2	T	(kg)	WDS No.
315	340	55	M16	73	6	25	26	6786-201

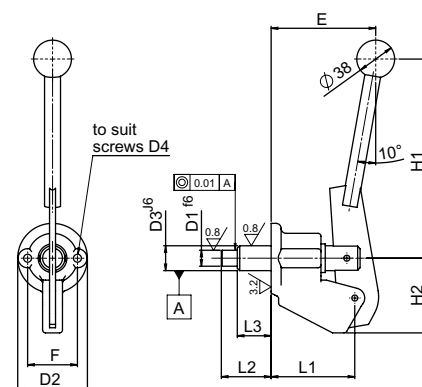
All dimensions in mm

WDS 6822

Index Plunger Unit

MATERIAL -

Body - Cast Iron

Bushes & Location Plunger - Steel
hardened & ground**Related Products: WDS 6821 Clamping Nut****Metric**

D1 ¹⁶	D2	D3 ¹⁶	D4	E	F	H1	H2	L1	L2	L3	 (kg)	WDS No.
16	70	25	M8	105	50	200	75	84	50	34	2.3	6822-216
22	90	35	M10	130	60	250	95	108	55	34	4.5	6822-222
30	105	45	M10	130	80	250	95	108	73	47	6	6822-230

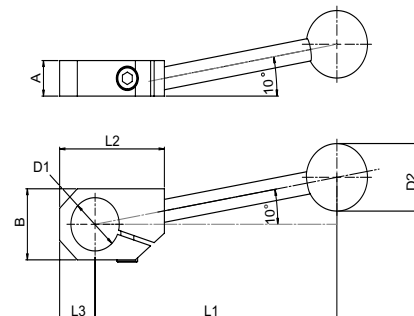
All dimensions in mm


WDS 6821

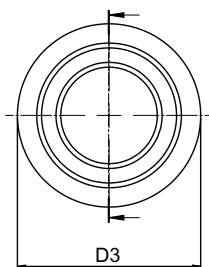
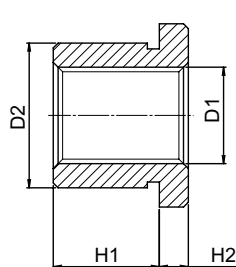
Clamping Handle

MATERIAL -

Steel



D1	L1	A	B	D2	L2	L3	 (kg)	WDS No.
16	100	20	25	32	50	16	0.2	6821-201
16	150	20	25	32	50	16	0.2	6821-202
22	100	20	30	32	60	19	0.2	6821-203
22	150	20	30	32	60	19	0.3	6821-204
22	200	20	30	32	60	19	0.4	6821-205
30	150	20	40	38	65	22	0.3	6821-206
30	200	20	40	38	65	22	0.4	6821-207
30	250	20	40	38	65	22	0.5	6821-208
35	150	25	45	38	80	28	0.5	6821-209
35	200	25	45	38	80	28	0.6	6821-210
35	250	25	45	38	80	28	0.7	6821-211
42	150	25	50	38	90	32	0.7	6821-212
42	200	25	50	38	90	32	0.8	6821-213
42	250	25	50	38	90	32	0.8	6821-214




WDS 6821

Clamping Handle Nut

MATERIAL -
Steel

Related Products: WDS 6821 Clamping Handle


D1	D2	D3	H1	H2	 (kg)	WDS No.
M10	16	22	22	6	0.03	6821-221
M12	22	28	22	6	0.08	6821-222
M16	22	28	22	6	0.07	6821-223
M20	30	38	22	6	0.10	6821-224
M24	35	45	28	10	0.15	6821-225
M30	42	55	28	10	0.20	6821-226



WDS 6620

Engineers Precision Parallels

MATERIAL -
Manufactured from high quality steel,
hardened and tempered
Ground on all four faces
Dimensional accuracy to B.S. 906:
Part 1 1972 Grade B
Size engraved on end of each parallel
Boxed in matched pairs

Size mm	Height Tolerance (mm) +/-	Parallelism Tolerance (mm) +/-	Net  (kg) (pair)	WDS No.
5 x 10 x 100	0.005	0.005	0.10	6620-205
10 x 20 x 125	0.005	0.005	0.40	6620-210
15 x 30 x 150	0.005	0.005	1.10	6620-215
20 x 40 x 200	0.01	0.008	2.60	6620-220
25 x 50 x 250	0.01	0.008	5.00	6620-225
30 x 60 x 300	0.013	0.013	8.60	6620-230

WDS 5570/5571

Precision Round Mandrels

MATERIAL -

Manufactured from high grade steel
hardened and ground

Sizes up to and including 36mm or 1½" are hardened right through

Sizes above 36mm or 1½" are case hardened

All mandrels have accurately lapped and protected centres.

Manufacturing Tolerances:
Concentric within 0.005mm
(0.0002") TIR



Metric:
To DIN 523.

Taper:
4-6mm 0.055mm per 100mm
7-18mm 0.05mm per 100mm
19-50mm 0.04mm per 100mm

Tolerance at any point on taper:
4-6mm ± 0.0025mm
7-10mm ± 0.003mm
12-18mm ± 0.004mm
19-30mm ± 0.0045mm
32-50mm ± 0.0055mm

Inch:
Taper: 0.0005" per inch

Size of small end:
⅜" to 1" nominal dia
-0.0005" to -0.001".
1⅛" to 2" nominal dia
-0.001" to -0.0015"

Metric Type 5570

Dia mm	Overall Length mm	Effective Length mm	WDS No.
4	65	45	5570-204
5	70	50	5570-205
6	70	50	5570-206
7	85	65	5570-207
8	85	65	5570-208
9	95	71	5570-209
10	95	71	5570-210
12	115	87	5570-212
13	115	87	5570-213
14	115	87	5570-214
15	130	96	5570-215
16	130	96	5570-216
18	130	96	5570-218
19	160	124	5570-219

Metric Type 5570

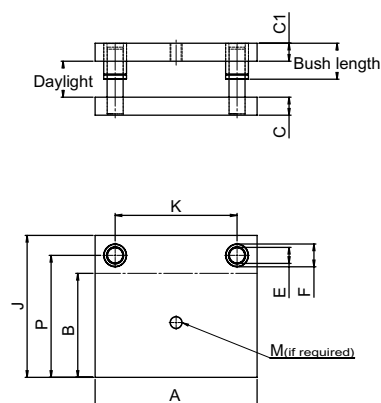
Dia mm	Overall Length mm	Effective Length mm	WDS No.
20	160	124	5570-220
22	160	124	5570-222
24	170	130	5570-224
25	170	130	5570-225
27	185	137	5570-227
28	185	137	5570-228
30	185	137	5570-230
32	220	170	5570-232
35	230	178	5570-235
36	230	178	5570-236
40	245	187	5570-240
45	265	199	5570-245
50	265	199	5570-250

Inch Type 5571

Dia in	Overall Length in	Effective Length in	WDS No.
⅜	3 ¼	2 ½	5571-103
¼	3 ¾	2 ¾	5571-104
⅝	4	3	5571-105
⅜	4 ¼	3 ¼	5571-106
7/16	4 ½	3 ½	5571-107
½	5	4	5571-108
9/16	5 ¼	4	5571-109
⅝	5 ½	4 ¼	5571-110
11/16	5 ¾	4 ½	5571-111
¾	6	4 ¾	5571-112
13/16	6 ¼	4 ¾	5571-113

Inch Type 5571

Dia in	Overall Length in	Effective Length in	WDS No.
7/8	6 ½	5	5571-114
15/16	6 ¾	5 ¼	5571-115
1	7	5 ½	5571-116
1 ⅛	7 ½	5 ½	5571-118
1 ¼	8	6	5571-120
1 ⅜	8 ½	6	5571-122
1 ½	9	6 ½	5571-124
1 ⅝	9 ½	7	5571-126
1 ¾	10	7 ½	5571-128
1 7/8	10 ½	8	5571-130
2	11 ¼	8 ¾	5571-132



WDS 9000

Die Set - Steel Standard Rear Pillar Rectangular Plate

MATERIAL -

Bush- Steel
Pillar - Steel

Plate - Mild Steel

Note: Plate thickness +0.0/-3.0
For Pillars and Bushes see 9002 & 9003 Series

Ordering Information

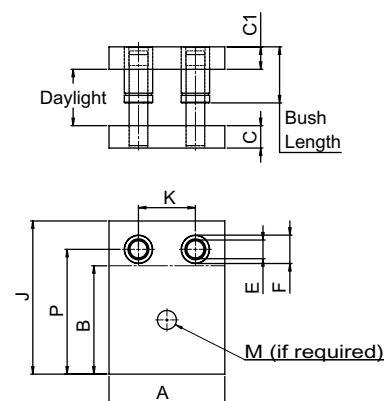
1. WDS Code
2. Daylight (Closed position)
3. Stroke required
4. Can pillars protrude through top plate
5. If shank is required (Metric or BSW)

Related Products: WDS 9004 Die Set Shank

Die Space A x B	Plate Size A x J	Pillar Centres K	Pillar Dia E	Bush O/D F	P	C	C1	Shank Size Available	WDS No.
205 x 95	205 x 155	127	25	38	117	30	30	M24 x 2.0 or 1" BSW	9000-2015S
205 x 145	205 x 205	127	25	38	167	30	30	M24 x 2.0 or 1" BSW	9000-2020S
255 x 95	255 x 155	177.8	25	38	117	30	30	M24 x 2.0 or 1" BSW	9000-2515S
255 x 145	255 x 205	177.8	25	38	167	30	30	M24 x 2.0 or 1" BSW	9000-2520S
255 x 195	255 x 255	177.8	25	38	217	30	30	M24 x 2.0 or 1" BSW	9000-2525S
305 x 85	305 x 155	203.2	32	45	110	40	40	M24 x 2.0 or 1" BSW	9000-3015S
305 x 135	305 x 205	203.2	32	45	160	40	40	M24 x 2.0 or 1" BSW	9000-3020S
305 x 185	305 x 255	203.2	32	45	210	40	40	M24 x 2.0 or 1" BSW	9000-3025S
305 x 235	305 x 305	203.2	32	45	260	40	40	M24 x 2.0 or 1" BSW	9000-3030S
355 x 135	355 x 205	254	32	45	160	40	40	M30 x 2.0 or 1 1/4" BSW	9000-3520S
355 x 185	355 x 255	254	32	45	210	40	40	M30 x 2.0 or 1 1/4" BSW	9000-3525S
355 x 235	355 x 305	254	32	45	260	40	40	M30 x 2.0 or 1 1/4" BSW	9000-3530S
355 x 285	355 x 355	254	32	45	310	40	40	M30 x 2.0 or 1 1/4" BSW	9000-3535S
405 x 124	405 x 205	304.8	40	57	155	45	45	M30 x 2.0 or 1 1/4" BSW	9000-4020S
405 x 174	405 x 255	304.8	40	57	205	45	45	M30 x 2.0 or 1 1/4" BSW	9000-4025S
405 x 224	405 x 305	304.8	40	57	255	45	45	M30 x 2.0 or 1 1/4" BSW	9000-4030S
405 x 274	405 x 355	304.8	40	57	305	45	45	M30 x 2.0 or 1 1/4" BSW	9000-4035S
455 x 174	455 x 255	355.6	40	57	205	45	45	M30 x 2.0 or 1 1/4" BSW	9000-4525S
455 x 224	455 x 305	355.6	40	57	255	45	45	M30 x 2.0 or 1 1/4" BSW	9000-4530S
455 x 274	455 x 355	355.6	40	57	305	45	45	M30 x 2.0 or 1 1/4" BSW	9000-4535S
455 x 324	455 x 405	355.6	40	57	355	45	45	M30 x 2.0 or 1 1/4" BSW	9000-4540S
505 x 224	505 x 305	406.4	40	57	255	45	45	M30 x 2.0 or 1 1/4" BSW	9000-5030S
505 x 274	505 x 355	406.4	40	57	305	45	45	M30 x 2.0 or 1 1/4" BSW	9000-5035S
505 x 324	505 x 405	406.4	40	57	355	45	45	M30 x 2.0 or 1 1/4" BSW	9000-5040S
505 x 424	505 x 505	406.4	40	57	455	45	45	M30 x 2.0 or 1 1/4" BSW	9000-5050S

WDS 9001

Die Set - Steel Standard Rear Pillar Rectangular Plate



MATERIAL -

Bush - Steel

Pillar - Steel

Plate - Mild Steel

Note: Plate thickness +0.0/-3.0

For Pillars & Bushes see 9002 & 9003

Series

Ordering Information

1. WDS Code
2. Daylight (Closed position)
3. Stroke required
4. Can pillars protrude through top plate
5. If shank is required (Metric or BSW)

Related Products: WDS 9004 Die Set Shank

Die Space A x B	Plate Size A x J	Pillar Centres K	Pillar Dia E	Bush O/D F	P	C	C1	Shank Size Available	WDS No.
155 x 145	155 x 205	76.2	25	38	167	30	30	M24 x 2.0 or 1" BSW	9001-2015S
205 x 195	205 x 255	127	25	38	217	30	30	M24 x 2.0 or 1" BSW	9001-2520S
255 x 235	255 x 305	152.4	32	45	260	40	40	M24 x 2.0 or 1" BSW	9001-3025S
255 x 285	255 x 355	152.4	32	45	310	40	40	M30 x 2.0 or 1 1/4" BSW	9001-3525S
255 x 324	255 x 355	152.4	32	45	310	40	40	M30 x 2.0 or 1 1/4" BSW	9001-3530S
305 x 285	305 x 405	203.2	40	57	355	45	45	M30 x 2.0 or 1 1/4" BSW	9001-4025S
305 x 324	305 x 405	203.2	40	57	355	45	45	M30 x 2.0 or 1 1/4" BSW	9001-4030S
305 x 374	305 x 405	203.2	40	57	355	45	45	M30 x 2.0 or 1 1/4" BSW	9001-4035S
355 x 324	355 x 455	254	40	57	405	45	45	M30 x 2.0 or 1 1/4" BSW	9001-4530S
355 x 374	355 x 455	254	40	57	405	45	45	M30 x 2.0 or 1 1/4" BSW	9001-4535S
355 x 424	355 x 455	254	40	57	405	45	45	M30 x 2.0 or 1 1/4" BSW	9001-4540S
405 x 374	405 x 505	304.8	40	57	455	45	45	M30 x 2.0 or 1 1/4" BSW	9001-5035S
405 x 424	405 x 505	304.8	40	57	455	45	45	M30 x 2.0 or 1 1/4" BSW	9001-5040S

You like our products but maybe you require something slightly different?

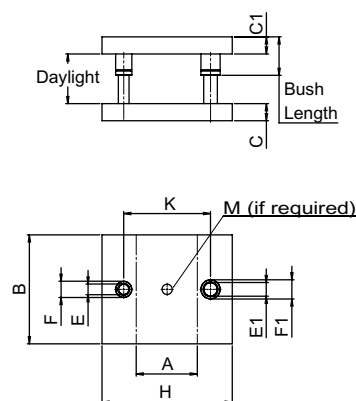
WDS Specials Service

WDS can manufacture bespoke parts, from design to delivery or from your own design.

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WDS 9009

Die Set - Steel Standard Centre Pillar Rectangular Plate

MATERIAL -

Bush - Steel

Pillar - Steel

Plate - Cast Iron

Note: Plate thickness +0.0/-3.0

For Pillars & Bushes see 9002 & 9003 Series

Ordering Information

1. WDS Code
2. Daylight (Closed position)
3. Stroke required
4. Can pillars protrude through top plate
5. If shank is required (Metric or BSW)

Related Products: WDS 9004 Die Set Shank

Die Space A x B	Plate Size B x H	Pillar Centres K	Pillar Dia E	Pillar Dia E1	Bush O/D F	Bush O/D F1	C	C1	Shank Size Available	WDS No.
84 x 155	155 x 205	127	19	25	30	38	30	30	M24 x 2 or 1" BSW	9009-2015S
84 x 205	205 x 205	127	19	25	30	38	30	30	M24 x 2 or 1" BSW	9009-2020S
134 x 205	205 x 255	177.8	19	25	30	38	30	30	M24 x 2 or 1" BSW	9009-2520S
134 x 255	255 x 255	177.8	19	25	30	38	30	30	M24 x 2 or 1" BSW	9009-2525S
153 x 255	255 x 305	203.2	25	32	38	45	40	40	M24 x 2 or 1" BSW	9009-3025S
153 x 305	305 x 305	203.2	25	32	38	45	40	40	M24 x 2 or 1" BSW	9009-3030S
203 x 255	255 x 355	254	25	32	38	45	40	40	M30 x 2 or 1 1/4" BSW	9009-3525S
203 x 305	305 x 355	254	25	32	38	45	40	40	M30 x 2 or 1 1/4" BSW	9009-3530S
203 x 355	355 x 355	254	25	32	38	45	40	40	M30 x 2 or 1 1/4" BSW	9009-3535S
242 x 255	255 x 405	304.8	32	40	45	57	45	45	M30 x 2 or 1 1/4" BSW	9009-4025S
242 x 305	305 x 405	304.8	32	40	45	57	45	45	M30 x 2 or 1 1/4" BSW	9009-4030S
242 x 355	355 x 405	304.8	32	40	45	57	45	45	M30 x 2 or 1 1/4" BSW	9009-4035S
292 x 305	305 x 455	355.6	32	40	45	57	45	45	M30 x 2 or 1 1/4" BSW	9009-4530S
292 x 355	355 x 455	355.6	32	40	45	57	45	45	M30 x 2 or 1 1/4" BSW	9009-4535S
292 x 405	405 x 455	355.6	32	40	45	57	45	45	M30 x 2 or 1 1/4" BSW	9009-4540S
342 x 355	355 x 505	406.4	32	40	45	57	45	45	M30 x 2 or 1 1/4" BSW	9009-5035S
342 x 405	405 x 505	406.4	32	40	45	57	45	45	M30 x 2 or 1 1/4" BSW	9009-5040S
342 x 505	505 x 505	406.4	32	40	45	57	45	45	M30 x 2 or 1 1/4" BSW	9009-5050S

Ready to Take the Plunge?

We have a range of sizes and specifications
to suit any application



Section 4



WDS 9011

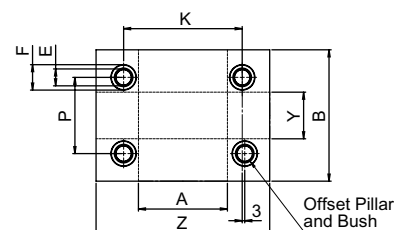
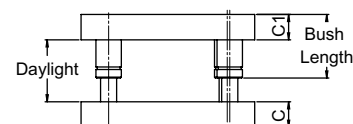
Die Set - Steel Standard Four Pillar Rectangular Plate

MATERIAL -
Bush - Steel
Pillar - Steel
Plate - Cast Iron

Note: Plate thickness $+0.0/-3.0$
For Pillars & Bushes see 9002 & 9003 Series

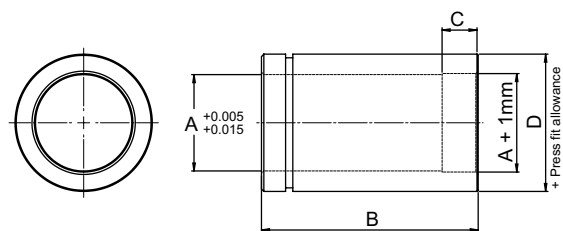
Ordering Information

1. WDS Code
2. Daylight (Closed position)
3. Stroke required
4. Can pillars protrude through top plate
5. If shank is required (Metric or BSW)



Related Products: WDS 9004 Die Set Shank

Alt. Die Space Y x Z	Alt. Die Space A x B	Pillar Centres K	Pillar Centres P	Pillar Dia E	Bush Dia F	C	C1	Shank Size Available	WDS No.
55 x 205	105 x 155	140	90	19	30	30	30	M24 x 2.0 or 1" BSW	9011-2015S
105 x 205	105 x 205	140	140	19	30	30	30	M24 x 2.0 or 1" BSW	9011-2020S
87 x 255	137 x 205	180	130	25	38	30	30	M24 x 2.0 or 1" BSW	9011-2520S
137 x 255	137 x 255	180	180	25	38	30	30	M24 x 2.0 or 1" BSW	9011-2525S
137 x 305	187 x 255	230	180	25	38	40	40	M24 x 2.0 or 1" BSW	9011-3025S
187 x 305	187 x 305	230	230	25	38	40	40	M24 x 2.0 or 1" BSW	9011-3030S
137 x 355	237 x 255	280	180	25	38	40	40	M30 x 2.0 or 1 1/4" BSW	9011-3525S
187 x 355	237 x 305	280	230	25	38	40	40	M30 x 2.0 or 1 1/4" BSW	9011-3530S
237 x 355	237 x 355	280	280	25	38	40	40	M30 x 2.0 or 1 1/4" BSW	9011-3535S
115 x 405	265 x 255	315	165	32	45	45	45	M30 x 2.0 or 1 1/4" BSW	9011-4025S
165 x 405	265 x 305	315	215	32	45	45	45	M30 x 2.0 or 1 1/4" BSW	9011-4030S
215 x 405	265 x 355	315	265	32	45	45	45	M30 x 2.0 or 1 1/4" BSW	9011-4035S
165 x 455	315 x 305	365	215	32	45	45	45	M30 x 2.0 or 1 1/4" BSW	9011-4530S
215 x 455	315 x 355	365	265	32	45	45	45	M30 x 2.0 or 1 1/4" BSW	9011-4535S
265 x 455	315 x 405	365	315	32	45	45	45	M30 x 2.0 or 1 1/4" BSW	9011-4540S
193 x 505	343 x 355	405	255	40	57	45	45	M30 x 2.0 or 1 1/4" BSW	9011-5035S
243 x 505	343 x 405	405	305	40	57	45	45	M30 x 2.0 or 1 1/4" BSW	9011-5040S
343 x 505	343 x 505	405	405	40	57	45	45	M30 x 2.0 or 1 1/4" BSW	9011-5050S



WDS 9002

Die Set Guide Bushes

MATERIAL -
Mild Steel Case
Hardened and ground

Dia A	OD B	C/Bore Depth C	Length D	WDS No.
19	30	10	50	9002-19050
19	30	25	65	9002-19065
19	30	35	75	9002-19075
19	30	50	90	9002-19090
19	30	60	100	9002-19100
19	30	90	130	9002-19130
25	38	-	50	9002-25050
25	38	15	65	9002-25065
25	38	25	75	9002-25075
25	38	40	90	9002-25090
25	38	50	100	9002-25100
25	38	65	115	9002-25115
25	38	80	130	9002-25130
32	45	-	65	9002-32065
32	45	10	75	9002-32075
32	45	25	90	9002-32090
32	45	35	100	9002-32100
32	45	50	115	9002-32115
32	45	65	130	9002-32130
40	57	0	75	9002-40075
40	57	15	90	9002-40090
40	57	25	100	9002-40100
40	57	40	115	9002-40115
40	57	55	130	9002-40130

WDS 9003

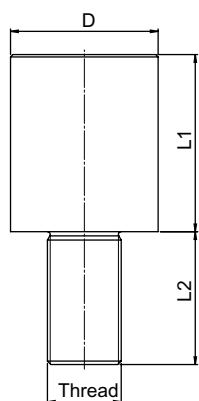
Die Set Guide Pillars

MATERIAL -
Mild Steel
Case Hardened and Ground



Dia A	Projecting Length B	Press Fit Length C	WDS No.
19	65	22	9003-19065
19	70	22	9003-19070
19	75	22	9003-19075
19	85	22	9003-19085
19	90	22	9003-19090
19	95	22	9003-19095
19	100	22	9003-19100
19	110	22	9003-19110
19	115	22	9003-19115
19	120	22	9003-19120
19	125	22	9003-19125
19	130	22	9003-19130
19	140	22	9003-19140
19	150	22	9003-19150
19	160	22	9003-19160
19	180	22	9003-19180
25	65	27	9003-25065
25	70	27	9003-25070
25	75	27	9003-25075
25	85	27	9003-25085
25	90	27	9003-25090
25	95	27	9003-25095
25	100	27	9003-25100
25	110	27	9003-25110
25	115	27	9003-25115
25	145	27	9003-25145
25	120	27	9003-25120
25	125	27	9003-25125
25	130	27	9003-25130
25	140	27	9003-25140
25	150	27	9003-25150
25	160	27	9003-25160
25	170	27	9003-25170
25	180	27	9003-25180
25	190	27	9003-25190
25	200	27	9003-25200
25	255	27	9003-25255
25	300	27	9003-25300
32	65	34	9003-32065
32	75	34	9003-32075
32	85	34	9003-32085
32	90	34	9003-32090
32	95	34	9003-32095
32	100	34	9003-32100
32	110	34	9003-32110

Dia A	Projecting Length B	Press Fit Length C	WDS No.
32	115	34	9003-32115
32	120	34	9003-32120
32	125	34	9003-32125
32	130	34	9003-32130
32	140	34	9003-32140
32	145	34	9003-32145
32	160	34	9003-32160
32	170	34	9003-32170
32	180	34	9003-32180
32	190	34	9003-32190
32	200	34	9003-32200
32	230	34	9003-32230
32	255	34	9003-32255
32	300	34	9003-32300
40	100	42	9003-40100
40	110	42	9003-40110
40	115	42	9003-40115
40	120	42	9003-40120
40	125	42	9003-40125
40	130	42	9003-40130
40	140	42	9003-40140
40	145	42	9003-40145
40	150	42	9003-40150
40	160	42	9003-40160
40	170	42	9003-40170
40	180	42	9003-40180
40	190	42	9003-40190
40	200	42	9003-40200
40	230	42	9003-40230
40	255	42	9003-40255
40	300	42	9003-40300

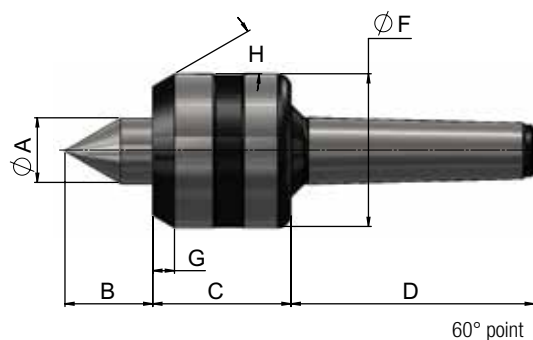


WDS 9004

Die Set Shank - Metric

MATERIAL -
Mild Steel
Case Hardened


Thread	D	L1	L2	WDS No.
M24 x 2	40	70	45	9004-520
M24 x 2	50	70	45	9004-543
M30 x 2	50	80	60	9004-561
M30 x 2	65	90	60	9004-573



WDS 5150

Rotating Centre - Standard Duty

Maximum runout 0.005mm T.I.R.

Morse Taper Shank	A	B	C	D	F	G	H	Maximum Rating Workpiece Kg	RPM	 (kg)	WDS No.
No. 1	13.5	20.3	27.9	60.2	34.9	5.8	20°	50	8000	0.35	5150-101
No. 2	20.6	25.7	46.5	71.4	47.2	6.1	30°	200	7000	0.80	5150-201
No. 3	23.4	31.8	50.0	88.1	55.3	7.9	30°	300	6000	1.35	5150-301
No. 4	26.2	35.1	55.4	111.0	63.5	9.7	30°	400	5000	2.00	5150-401
No. 5	38.0	47.6	55.4	142.5	63.5	13.0	30°	500	4000	4.00	5150-501

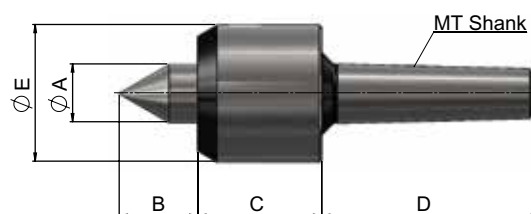
WDS 5153


Rotating Centre CNC High Speed

Designed for high speed CNC lathes
Lubricated for life with specially
formulated grease to control thermal
distortion and maintain running
accuracy
Body and centre hardened and
ground
Rear needle bearing gives increase
rigidity and reduced point deflection
High precision gives maximum
runout of 0.003mm



60° point



Morse Taper Shank	A	B	C	D	E	Maximum Rating W/piece wt kg	Speed RPM	 (kg)	WDS No.
No 3	25	32.5	58	86	53	600	8000	1.2	5153-301
No 4	25	32.5	58	107	53	600	8000	2.0	5153-401
No 5	36	50	70	136	80	1000	7000	4.4	5153-501

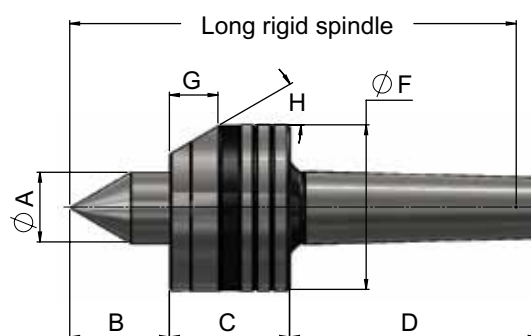
WDS 5155


Rotating Centre - High Duty

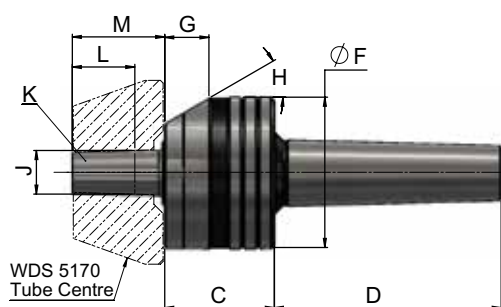
Designed for heavy duty precision turn-
ing and grinding
Unit is pre-loaded, self-adjusting and
lubricated for life
Body and centre are hardened and
ground
Tail bearing gives long, rigid spindle
support
60° point is ground, after assembly,
running in its own bearings
Maximum runout 0.005mm T.I.R.



60° point



Morse Taper Shank	A	B	C	D	F	G	H	Maximum Rating W/piece wt kg	RPM	 (kg)	WDS No.
No 3	23.4	33.5	40.6	88.1	55.3	16.0	30°	500	5000	1.15	5155-301
No 4	30.5	42.7	48.3	111.8	63.5	14.7	30°	800	4000	1.90	5155-401
No 5	42.5	58.0	65.0	140.0	83.2	16.0	30°	1500	3000	4.40	5155-501
No 6	63.5	79.2	110.7	192.0	117.5	30.2	30°	2500	2000	13.50	5155-601



5165-201 body detail as WDS 5150-201
Other body details as WDS 5155 series




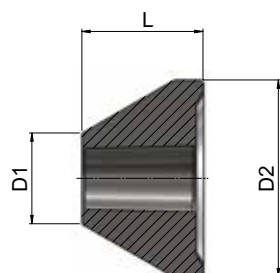
Morse Taper Nose

WDS 5165

Rotating Centre - Taper Nose Type

Designed for tube work
All bearings are pre-loaded, self-adjusting and lubricated for life
Body and morse taper nose are hardened and ground
Morse taper nose is ground after assembly, running in its own bearings
Maximum runout of spigot 0.005mm T.I.R.
Body dimensions as WDS 5155

Morse Taper Shank	C	D	F	G	H	J	K Morse Taper Nose	L	M	Use with Tube Centre	 (kg)	WDS No.
No. 2	46.5	71.4	47.2	6.1	30°	16.05	No. 2	23	31.7	5170-201/301/401	0.80	5165-201
No. 3	40.6	88.1	55.3	16.0	30°	16.05	No. 2	23	34.0	5170-201/301/401	1.15	5165-301
No. 4	48.3	111.8	63.5	14.7	30°	23.89	No. 3	31	44.0	5170-202/302/402	1.90	5165-401
No. 5	65.0	140.0	83.2	16.0	30°	31.35	No. 4	38	50.8	5170-203/303/403	4.40	5165-501
No. 6	110.7	192.0	117.5	30.2	30°	44.44	No. 5	57	86.4	5170-204/304/404	13.50	5165-601




WDS 5170


Tube Centres

Hardened and ground all over
Other sizes to order

Small 60°

For use with	L	D1	D2	 (kg)	WDS No.
5165-301	27	17	35	0.115	5170-201
5165-401	36	26	59	0.370	5170-202
5165-501	48	36	78	0.945	5170-203
5165-601	71	51	120	0.100	5170-204

Large 60°

For use with	L	D1	D2	 (kg)	WDS No.
5165-301	27	28	51	0.29	5170-301
5165-401	36	38	73	0.65	5170-302
5165-501	48	51	98	1.50	5170-303
5165-601	71	73	140	4.30	5170-304

90°

For use with	L	D1	D2	 (kg)	WDS No.
5165-301	27	17	51	0.225	5170-401
5165-401	36	26	73	0.615	5170-402
5165-501	48	36	98	1.595	5170-403
5165-601	71	51	140	4.500	5170-404

WDS 5560

Grinding Carrier

Precision Steel castings.
Suitable for any light machining
operation requiring a carrier.



Capacity
mm

Net  kg

WDS No.

up to 6	0.09	5560-0006
6-9	0.10	5560-0609
9-12	0.11	5560-0912
12-15	0.12	5560-1215
15-20	0.15	5560-1520
20-25	0.15	5560-2025
25-30	0.20	5560-2530

Capacity
mm

Net  kg

WDS No.

30-35	0.20	5560-3035
35-40	0.30	5560-3540
40-50	0.30	5560-4050
50-60	0.40	5560-5060
60-70	0.40	5560-6070
70-80	0.50	5560-7080
80-90	0.50	5560-8090
90-100	0.50	5560-9010

WDS 5561

Grinding Carrier Box Set

10 Grinding Carriers with capacity
of 0 to 50mm diameter. The box
is manufactured from resilient
material making it suitable for
storing carriers in their working
environment.



Box Set
Quantity

Range

WDS No.

10	0 to 50mm	5561-0050
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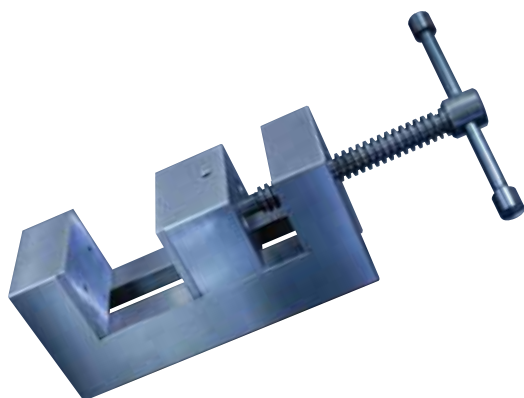


WDS 5000

Unigrip Machine Vice

For drilling and light milling
The vice can be used vertically
Handle mounted on ball bearings

Description	WDS No. 5000-201
Width of jaws	83
Max jaw opening (lower/upper)	50
Depth of jaws	32
Overall size of base	148 x 129
Overall height	60
Clamp bolt centres	114
Nett weight (kg)	3.3



WDS 5005

Light Duty Machine Vice

Designed for light work
Both sides are machined square
with the base to 0.04mm so that
vice can be located on base or sides
Jaw plates are hardened and
ground
For spare standard jaw plates see
WDS No 5100-101
Optional V-Jaw available
WDS No 5006-201 to hold round or
irregular parts

Description	WDS No. 5005-201
Width of jaws	70
Max jaw opening	78
Depth of jaws	48
Overall size of base	180 x 70
Overall height	83
Nett weight (kg)	4.5

WDS 5035

Machine Vice

Vice body made from high grade cast iron for rigidity

Low overall height

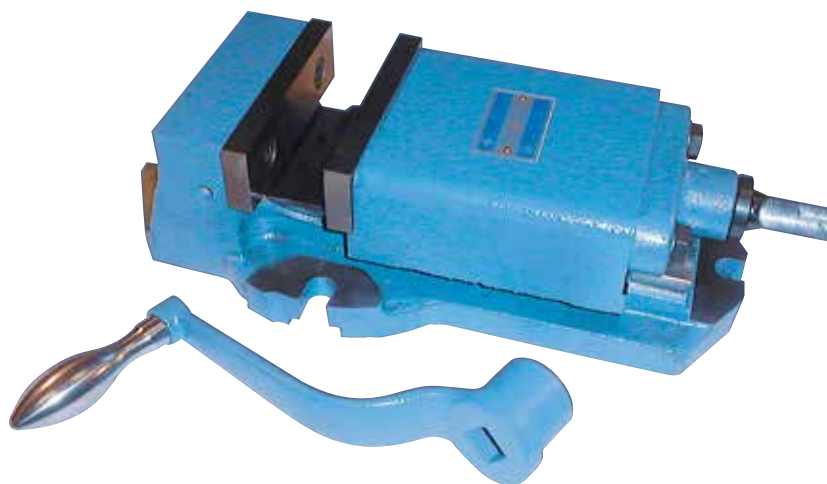
Moving jaw runs in long prismatic slides with provision for wear adjustment

Hardened and ground steel jaw plates supplied as standard

Totally enclosed acme screw with three point location operating in a phosphor bronze nut

25mm tenon slot machined in base as standard

Supplied complete with drop forged handle



Description	WDS No. 5035-201	WDS No. 5035-203	WDS No. 5035-204	WDS No. 5035-205
Width of jaws	105	155	155	210
Max jaw opening	75	125	165	205
Depth of jaws	38	53	53	59
Overall size of base	300 x 146	425 x 212	495 x 212	593 x 268
Overall height	84	105	105	126
Clamp bolt centres	125 x 260	185 x 395	185 x 455	240 x 553
Nett weight (kg)	12.2	32	36.4	63
Replacement hard jaws	5100-201	5100-203	5100-203	5100-204
Optional soft jaws	5101-201	5101-203	5101-203	5101-204



Can You Put a Price on Safety?

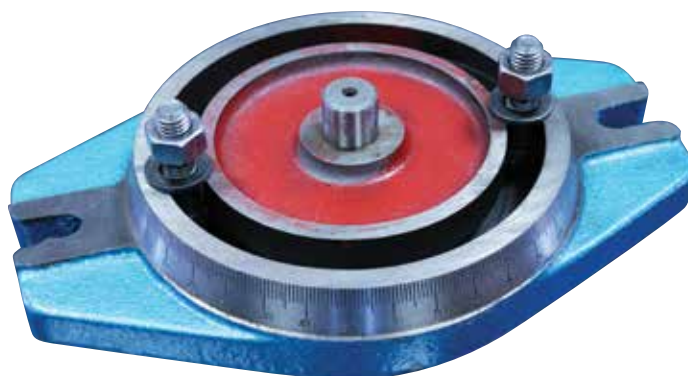
Check out our new high quality, certified Eye Bolts and Eye Nuts
All at great prices!



WDS 5034

**Milling Machine
Vices Fixed Base**

mm	Width of Jaws		mm	Max Opening		WDS No. Optional Swivel Base	WDS No.
	inch			inch			
100	4		80	3 1/8		5033-101	5034-100
125	5		100	4		5033-101	5034-125
160	6 1/4		125	5		5033-102	5034-160
200	8		160	6 1/4		5033-103	5034-200
250	10		200	8		5033-104	5034-250



WDS 5033

**Swivel Bases
For Machine Vices
5034**

Base Size	Fitting Vices	WDS No.
125mm	5034-100, 5034-125	5033-101
160mm	5034-160	5033-102
200mm	5034-200	5033-103
250mm	5034-250	5033-104

Technical Information

Soft Jaws for Chucks

Material Specification-

All Chuck Jaws are made from Bright Drawn Steel to BS 970/83 080M15 (EN 32B) suitable for case hardening, and supplied with a natural finish.

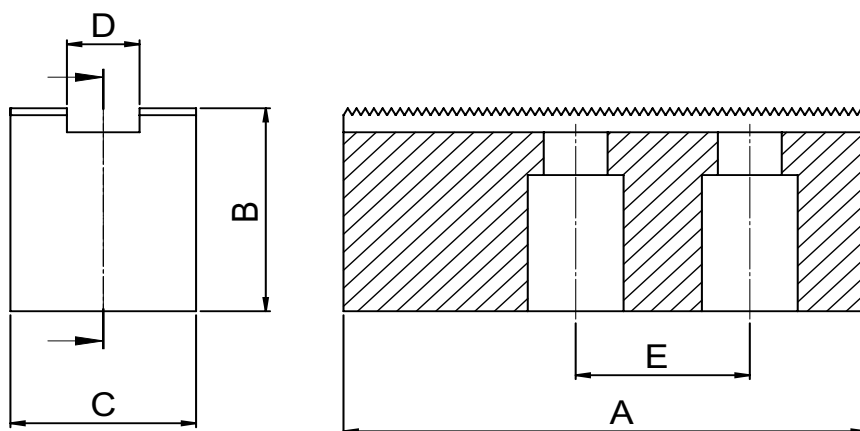
A guide before ordering

Customers are advised to check the mounting dimensions of their existing jaws to ensure the correct ones are being ordered.

The customer will also need to know the make and size of the chuck before using this catalogue.

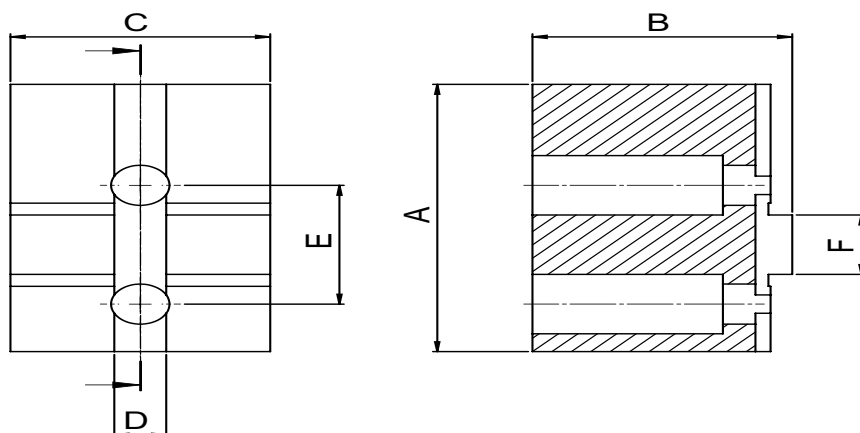
Shown below are the important dimensions to check.

Serrated Type



Serrations = Pitch x Angle
 Example 1.5mm x 60°
 3mm x 60°
 $\frac{1}{16}$ " x 90°
 $\frac{3}{32}$ " x 90°
 D = Slot Width
 E = Hole centre spacing

Slot/Tenon Type



D = Slot Width
 F = Tenon Width
 E = Hole centre spacing

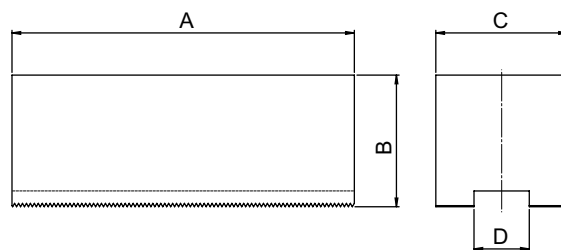
Index

Soft Jaws					
Chuck Manufacturer	Serrated Blank WDS No.	Serrated Standard WDS No.	Serrated Large/Long WDS No.	Serrated Pointed WDS No.	Slot and Tenon WDS No.
Autoblok	10005	10030	10030		10085
Berg	10005	10030	10030		10080
Herbert - Coventry Pratt - Tudor		10060	10060	10065	
Cushman					10085
Forkardt	10005	10030	10030		10080
Gamet	10000 10005	10030 10040	10030 10040		10080
Geiger & Haag	10005	10030	10030		
Hofmann	10005	10030	10030		
Howa	10000 10005	10015 10025	10015 10025	10020	
Kitagawa	10000	10015	10015	10020	10080
Matsumoto	10015 10000	10015 10025	10015 10025	10020	
Nikko	10000	10040			
Pratt Burnerd	10005				10085
Reishauer					10080
Rohm	10000 10005	10030 10040	10030		10080 10085
SCA					10085
SMW	10005	10030	10030		10080
Suga	10000	10040			
For T-Nuts to suit the above see 10100 Series page					

WDS 10000/10005

**Serrated Soft Top Jaw
Blanks (without bolt
holes)**

MATERIAL -
Steel 080M15
3 Jaws per set

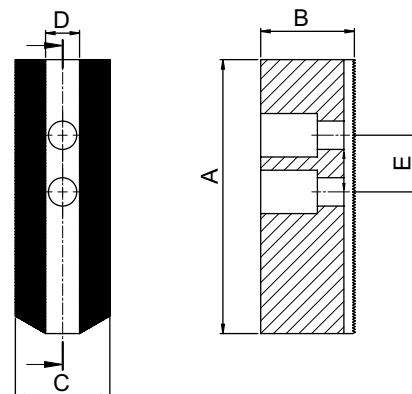


A	B	C	D	Serrations	⚖️ (kg)/set	WDS No.
72	38	32	12	1.5 x 60°	1.7	10000-201
102	44	32	14	1.5 x 60°	3.2	10000-207
84	40	40	16	1.5 x 60°	3.1	10000-209
90	60	40	16	1.5 x 60°	4.9	10000-210
110	100	40	16	1.5 x 60°	10.2	10000-214
130	50	50	18	1.5 x 60°	7.6	10000-217
130	80	50	18	1.5 x 60°	11.9	10000-218
130	50	50	21	1.5 x 60°	7.5	10000-219
130	80	50	21	1.5 x 60°	11.7	10000-222
90	40	40	17	1/16" x 90°	3.2	10005-204
80	50	40	17	1/16" x 90°	3.7	10005-205
70	60	40	17	1/16" x 90°	3.8	10005-206
90	60	40	17	1/16" x 90°	4.9	10005-207
120	50	50	21	1/16" x 90°	6.8	10005-209
120	80	50	21	1/16" x 90°	10.9	10005-210

WDS 10020

**Serrated Soft Top Jaws
Pointed Standard and
Extra Long**

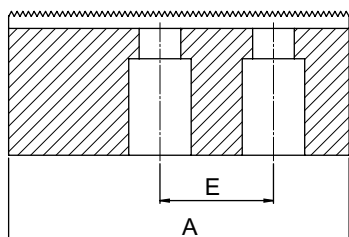
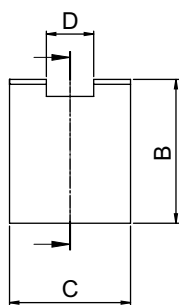
MATERIAL -
Steel 080M15
3 Jaws per set



Related Products:

To Suit Kitagawa, Matsumoto and Howa Chucks

Chuck Sizes	A	B	C	D	E	Serrations	Bolt Sizes	⚖️ (kg)/set	To Suit Chuck Make	WDS No.
110 (4") 135	50	25	25	10	14	1.5 x 60°	M8	0.4	Kitagawa and Howa	10020-203
135 (5")	57	32	25	10	18	1.5 x 60°	M8	0.6	Kitagawa	10020-204
135 (5")	62	25	25	10	19	1.5 x 60°	M8	0.5	Kita, Matsumoto, Howa	10020-206
165 (6")	82	32	32	12	20	1.5 x 60°	M10	1.3	Kitagawa & Howa	10020-208
210 (8")	95	44	32	14	25	1.5 x 60°	M12	2.2	Kita, Matsumoto, Howa	10020-210
210 (8")	85	40	40	16	25	1.5 x 60°	M12	2.7	Howa	10020-211
254 (10")	110	40	40	16	30	1.5 x 60°	M12	3.6	Kitagawa, Matsumoto	10020-212
254 (10")	110	60	40	16	30	1.5 x 60°	M12	5.2	Kitagawa, Matsumoto	10020-214
254 (10")	125	40	40	16	30	1.5 x 60°	M12	4.4	Kitagawa, Matsumoto	10020-215
304 (12")	145	50	50	18	30	1.5 x 60°	M14	7.2	Kita, Matsumoto, Howa	10020-219




WDS 10015

Serrated Soft Top Jaws Standard and Extra High

MATERIAL -
Steel 080M15
3 Jaws per set

To Suit Kitagawa, Matsumoto and Howa Chucks

Chuck Sizes	A	B	C	D	E	Serrations	Bolt Sizes	 (kg)/set	To Suit Chuck Make	WDS No.
110 (4")	48	25	20	8	15	1.5 x 60°	M6	0.4	Kitagawa	10015-201
110 (4") 135	55	50	25	10	14	1.5 x 60°	M8	0.5	Kitagawa and Howa	10015-203
135 (5")	57	50	25	10	18	1.5 x 60°	M8	1.2	Kitagawa	10015-205
165 (6")	72	38	32	12	20	1.5 x 60°	M10	1.4	Kitagawa and Howa	10015-208
165 (6")	72	57	32	12	20	1.5 x 60°	M10	2.4	Kitagawa and Howa	10015-209
210 (8")	95	44	32	14	25	1.5 x 60°	M12	2.3	Kita, Matsumoto, Howa	10015-210
210 (8")	95	70	32	14	25	1.5 x 60°	M12	4.0	Kita, Matsumoto, Howa	10015-211
254 (10")	110	40	40	16	30	1.5 x 60°	M12	3.9	Kitagawa, Matsumoto	10015-212
254 (10")	110	80	40	16	30	1.5 x 60°	M12	6.9	Kitagawa, Matsumoto	10015-213
254 (10")	90	60	40	16	30	1.5 x 60°	M12	4.2	Kitagawa, Matsumoto	10015-214
304 (12")	130	50	50	18	30	1.5 x 60°	M14	6.7	Kita, Matsumoto, Howa	10015-215
304 (12")	130	80	50	18	30	1.5 x 60°	M14	10.4	Kita, Matsumoto, Howa	10015-217
304 (12")	130	100	50	18	30	1.5 x 60°	M14	13.4	Kita, Matsumoto, Howa	10015-218
304 (12")	130	50	50	21	30	1.5 x 60°	M16	6.6	Kitagawa	10015-220
304 (12")	130	80	50	21	30	1.5 x 60°	M16	10.3	Kitagawa	10015-221
381 (15") 454	165	76	64	22	43	1.5 x 60°	M20	15.2	Kitagawa	10015-222
381 (15") 454	165	127	64	22	43	1.5 x 60°	M20	26.0	Kitagawa	10015-223
381 (15") 454	156	76	64	22	60	1.5 x 60°	M20	14.5	Kitagawa	10015-224
454, 530, 610	180	76	64	25	60	3 x 60°	M20	16.5	Kitagawa	10015-226
610 (24")	210	102	76	25	80	3 x 60°	M20	32.0	Kitagawa	10015-228

(((Good Vibrations)))

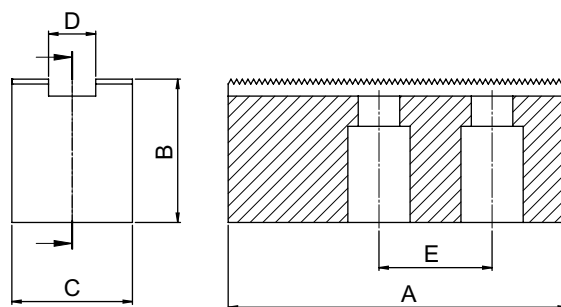
Medium Duty Anti-Vibration Mounts - Great Choice at Great Prices




WDS 10025

**Serrated Soft Top
Jaws Standard
and Extra High**

MATERIAL -
Steel 080M15
3 Jaws per set



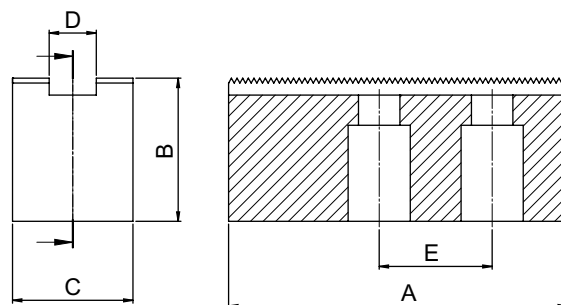
To Suit Howa and Matsumoto Chucks

Chuck Sizes	A	B	C	D	E	Serrations	Bolt Sizes	 (kg)/set	To Suit Chuck Make	WDS No.
110 and 135	48	25	25	11	16	1.5 x 60°	M8	0.6	Howa	10025-202
165 (6")	72	38	32	12	20	3 x 60°	M10	1.6	Howa	10025-204
210 (8")	95	44	32	14	25	3 x 60°	M12	2.6	Howa	10025-205
210 (8")	85	40	40	16	25	1.5 x 60°	M12	2.8	Howa	10025-211
254 (10")	110	40	40	16	30	3 x 60°	M12	3.6	Howa	10025-212
210 and 254	85	60	40	16	25	1.5 x 60°	M12	2.5	Howa	10025-214
254 (10")	105	40	40	18	30	1.5 x 60°	M14	4.2	Howa and Matsumoto	10025-216
304 (12")	130	50	50	18	30	3 x 60°	M14	6.7	Howa	10025-218
304 (12")	105	60	40	18	30	1.5 x 60°	M14	3.8	Howa and Matsumoto	10025-220
304 (12")	111	65	50	21	35	1.5 x 60°	M16	7.2	Howa	10025-222
381 (15")	150	76	64	22	50	3 x 60°	M20	13.7	Matsumoto	10025-224


WDS 10040

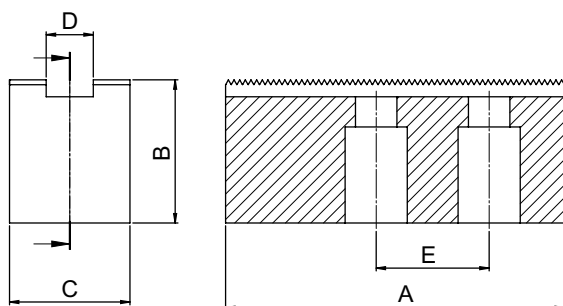
**Serrated Soft Top
Jaws (60° Serrations)
Standard**

MATERIAL -
Steel 080M15
3 Jaws per set



*To Suit Gamet, Nikko, Röhm and Suga Power Chucks

Chuck Sizes	A	B	C	D	E	Serrations	Bolt Sizes	 (kg)/set	To Suit Chuck Make	WDS No.
105	53	30	20	10	15	1.5 x 60°	M8	0.6	Gamet and Röhm	10040-201
160 and 170	67	40	30	11	20	1.5 x 60°	M8	1.8	All makes*	10040-203
215	89	57	32	14	26	1.5 x 60°	M10	3.2	All makes*	10040-204
250 and 280	89	57	44	20	26	1.5 x 60°	M12	4.7	All makes*	10040-205
350	120	80	50	21	28	1.5 x 60°	M16	9.5	All makes*	10040-206




WDS 10030

**Serrated Soft Top
Jaws Standard
and Extra High**

MATERIAL -
Steel 080M15
3 Jaws per set

*To Suit Autoblok, Berg, Forkardt, Gamet, Geiger-Haag, Hofmann, Röhm and SMW Power Chucks

Chuck Sizes	A	B	C	D	E	Serrations	Bolt Sizes	 (kg)/set	To Suit Chuck Make	WDS No.
125	68	40	30	11	18	1/16 x 90°	M8	1.6	SMW	10030-201
125 and 130	60	32	32	12	16	1/16 x 90°	M8	0.9	Autoblok and Berg	10030-202
140 and 160	70	45	25	10	19	1/16 x 90°	M10	1.5	Berg	10030-203
160	88	51	32	14	25	1/16 x 90°	M10	3.2	SMW	10030-204
165 and 170	80	38	32	14	20	1/16 x 90°	M10	2.6	Autoblok	10030-205
175 and 200	80	57	32	12	21	1/16 x 90°	M12	2.5	Berg	10030-206
160 and 175	70	60	40	17	22	1/16 x 90°	M12	3.1	All makes*	10030-208
200 and 220	90	40	40	17	22	1/16 x 90°	M12	2.9	All makes*	10030-209
200 and 220	90	60	40	17	22	1/16 x 90°	M12	4.1	All makes*	10030-210
250 and 315	111	60	40	16	29	1/16 x 90°	M16	4.8	Berg	10030-212
250 and 315	120	70	50	21	30	1/16 x 90°	M14	9.7	SMW	10030-213
250 and 315	120	50	50	21	28	1/16 x 90°	M16	5.4	All makes*	10030-214
250 and 315	120	80	50	21	28	1/16 x 90°	M16	9.4	All makes*	10030-215
300	140	89	64	25.5	35	1/16 x 90°	M20	12.5	Forkardt, Gamet, Hofmann	10030-216
400 and 500	155	89	64	25.5	35	3/32 x 90°	M20	19.5	All makes*	10030-219

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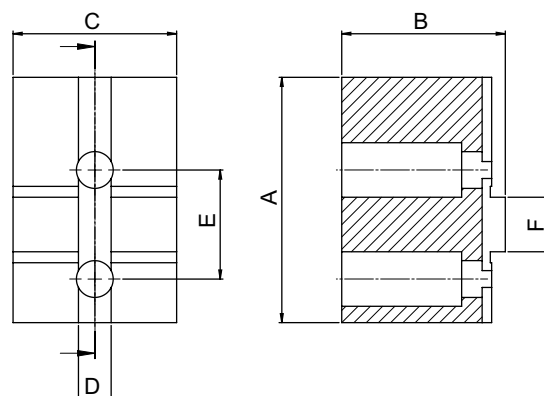
Call 0113 290 5822 for details or email sales@wdsltd.co.uk




WDS 10080

**Slot/Tenon Soft Top
Jaws (To Suit Quick
Change Chucks)**

MATERIAL -
Steel 080M15
3 Jaws per set



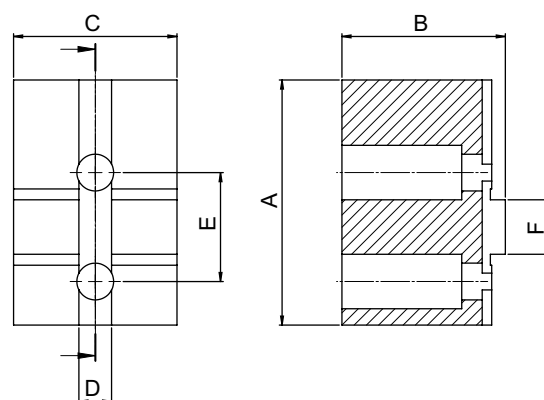
*To Suit Röhmm, Berg, Forkardt, Gamet, Kitagawa, Reishauer and SMW Chucks

Chuck Sizes	A	B	C	D	E	F	Bolt Sizes	 (kg)/set	To Suit Chuck Make	WDS No.
140 and 152	69	40	20	8	32	18	M8	0.9	Röhmm, SMW and Gamet	10080-201
140 and 152	63	45	30	8	32	18	M8	1.7	Röhmm, SMW and Gamet	10080-202
160 and 175	85	40	20	8	32	18	M8	1.2	All above listed chucks, except Kitagawa	10080-203
160 and 175	85	55	30	8	32	18	M8	2.6		10080-204
160 and 175	60	40	40	8	32	18	M8	1.8		10080-205
160 and 175	70	60	40	8	32	18	M8	3.3		10080-206
200, 215 & 8"	105	51	22	10	40	20	M8	2.1	All makes*	10080-207
200, 215 & 8"	100	55	30	10	40	20	M8	2.9	All makes*	10080-208
200, 215 & 8"	70	40	40	10	40	20	M8	2.1	All makes*	10080-209
200, 215 & 8"	85	60	40	10	40	20	M8	4.0	All makes*	10080-210
250, 315, 330, 10" & 12"	125	55	30	12	40	20	M12	3.6	All makes*	10080-211
250, 315, 330, 10" & 12"	90	60	40	12	40	20	M12	3.9	All makes*	10080-212
250, 315, 330, 10" & 12"	125	60	40	12	40	20	M12	5.8	All makes*	10080-213
250, 315, 330, 10" & 12"	125	100	40	12	40	20	M12	9.6	All makes*	10080-214
250, 315, 330, 10" & 12"	90	60	60	12	40	20	M12	6.4	All makes*	10080-215
250, 315, 330, 10" & 12"	90	60	80	12	40	20	M12	6.9	All makes*	10080-216


WDS 10085

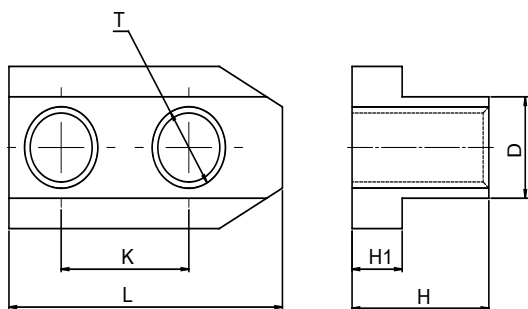
**Slot/Tenon Soft Top
Jaws (with inch
slots & tenons)**

MATERIAL -
Steel 080M15
3 Jaws per set



*To Suit Röhmm, Autoblok, Pratt, Cushman and SCA Chucks

Chuck Sizes	A	B	C	D	E	F	Bolt Sizes	 (kg)/set	To Suit Chuck Make	WDS No.
140 and 160	74	40	25	5/16	1 1/2	1/2	3/4	1.8	Röhmm, Autoblok and Pratt	10085-202
200	87	44	32	5/16	1 3/4	1/2	3/4	2.6	All makes*	10085-203
250 and 280	103	57	32	1/2	2 1/8	3/4	1/2 / M12	3.9	All makes*	10085-204
305 and 315	120	60	40	1/2	2 1/2	3/4	1/2 / M12	5.8	All makes*	10085-205
350, 380, 400	137	70	40	1/2"	3	3/4	5/8 / M16	7.5	All makes*	10085-206
460, 500, 630	140	80	50	1/2	3	3/4	3/4	12.0	All makes*	10085-207



WDS 10100

Chuck Tee Nuts

MATERIAL -


Steel BS. 970 Gr.817M40

Chemical Black Finish

Supplied with cap head screw of length

L

* = SINGLE HOLE TEE NUT

D	H	H1	K	T	L	 (g)	WDS No.
8	13.5	4.5	15	M6	18	28	10100-201
10	15	5.5	14	M8	20	40	10100-203
10	18	5.5	18	M8	22	51	10100-205
11	16.5	6.5	16	M8	20	50	10100-207
12	17	7	*	M8	20	35	10100-209
12	21	7	20	M10	25	79	10100-211
12	18.5	7.5	20	M10	25	74	10100-213
14	23	8	25	M12	30	122	10100-215
14	20.5	8.2	25	M12	25	110	10100-217
16	26.5	8.5	25	M12	35	161	10100-219
16	23	8	30	M12	30	160	10100-221
16	21.5	8.5	30	M12	30	154	10100-223
17	23	9	*	M12	30	88	10100-225
17	23	9	22	M12	30	142	10100-227
18	27.5	9.5	30	M14	35	212	10100-229
18	33	13.5	30	M14	45	268	10100-231
21	27	11	*	M16	35	158	10100-233
21	27	11	28	M16	35	253	10100-235
21	28	11.5	30	M16	35	270	10100-237
22	45.5	16.5	43	M20	55	578	10100-239

WDS

6601/6609

Marlco Thread Measuring Parallels

The thread measuring parallels represent what is probably the simplest and most flexible method of checking the EFFECTIVE DIAMETER of external screw threads.

They are manufactured to the highest degree of accuracy and to a specification certified by the National Physical Laboratory. Each pair covers a range of pitches irrespective of diameter or direction of thread.



Accuracy and Adaptability

The effective diameter of any thread within the pitch range of the Thread Measuring Parallels can be checked to an accuracy of 0.005mm (0.0002"). This applies to left or right hand threads of any diameter.

The workpiece does not have to be removed from the machine for checking and, therefore, the Parallels are applicable to both production sampling and inspection situations.

Due to the length of the gauging surfaces, the parallels have an exceptionally long life and offer substantial advantages in terms of flexibility and simplicity over alternative methods.

Simplicity

Standard measuring equipment, usually a micrometer, is all that is necessary for use with the thread measuring parallels and no complicated calculations or tables are required. A calibrated 'zero' is established by taking a reading over the pair of parallels (dimension X) and a reading is then taken over the workpiece (dimension Y).

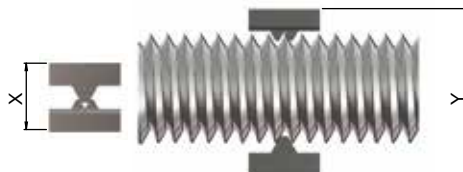
The EFFECTIVE DIAMETER=Y-X

It is as simple as that!

Calibration

Due to the method of use, i.e. establishing the 'X' dimension with the measuring instrument to be used for checking the thread, the parallels are self-calibrating when new and results do not rely on the 'zero' accuracy of the micrometer. Certificates of Conformity are available guaranteeing that the parallels are manufactured to specification.

A chargeable calibration service, traceable to UKAS standards, is offered for new parallels and also a re-calibration service to detect wear in used parallels.





Effective Dia = Y-X



WDS

6601/6609

Marlco Thread Measuring Parallels

TECHNICAL INFORMATION -
The Thread Measuring Parallels are supplied as sets or individual pairs complete with plastic clips
Sets are presented in plush lined boxes

Metric

Individual Pairs with pitch range:	WDS No.
0.5 to 0.75mm pitch	6601-201P
0.8 to 1.25mm pitch	6601-202P
1.5 to 2mm pitch	6601-203P
2.5 to 3.5mm pitch	6601-204P
4 to 6mm pitch	6601-205P

Set of Parallels	WDS No.
Consisting of five pairs of parallels. Full range: 0.5 to 6mm pitch.	6601

B.S. Whitworth

Individual Pairs with T.P.I. range:	WDS No.
4.5 to 7 T.P.I.	6602-04507P
8 to 13 T.P.I.	6602-0813P
14 to 20 T.P.I.	6602-1420P
22 to 30 T.P.I.	6602-2230P
32 to 40 T.P.I.	6602-3240P

Set of Parallels	WDS No.
Consisting of five pairs of parallels. Full range: 40 to 4.5 T.P.I.	6602

Unified/US National

Individual Pairs with T.P.I. range:	WDS No.
4 to 7 T.P.I.	6603-0407P
8 to 12 T.P.I.	6603-0812P
13 to 18 T.P.I.	6603-1318P
20 to 28 T.P.I.	6603-2028P
32 to 44 T.P.I.	6603-3244P

Set of Parallels	WDS No.
Consisting of five pairs of parallels. Full range: 44 to 4 T.P.I.	6603

B.A.

Individual Pairs Thread range:	WDS No.
0 to 2BA	6604-0002P
3 to 4BA	6604-0304P
5 to 6BA	6604-0506P

Set of Parallels	WDS No.
Consisting of three pairs of parallels. Full range: 0BA to 6BA	6604

	WDS No.
Spare Plastic Clips (Pair)	6609

Plastic clips supplied are suitable for workpieces up to approximately 110mm diameter

The design permits modification by the user to extend the capacity for larger diameter components



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WDS

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