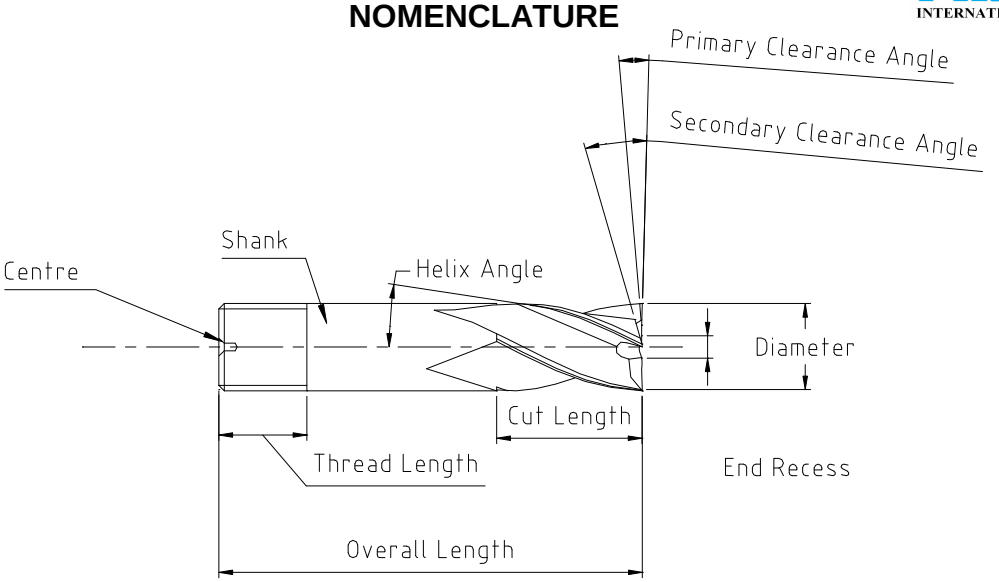
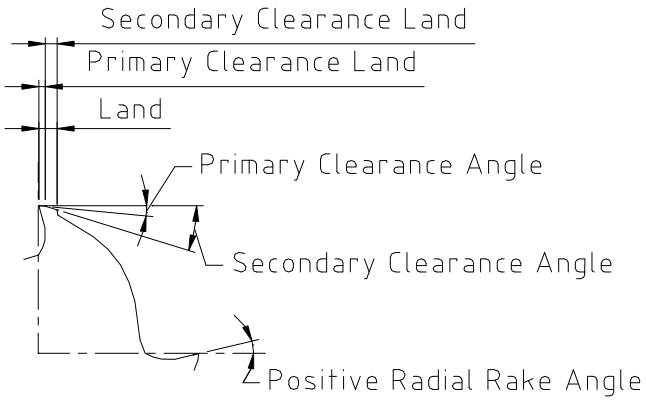
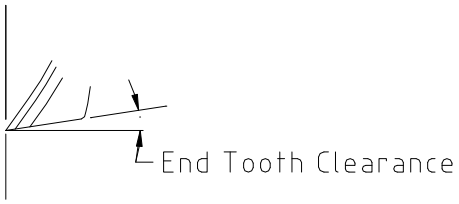
CUTTERS
NOMENCLATURE

PRESTO INTERNATIONAL LIMITED

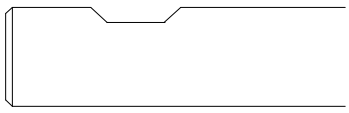






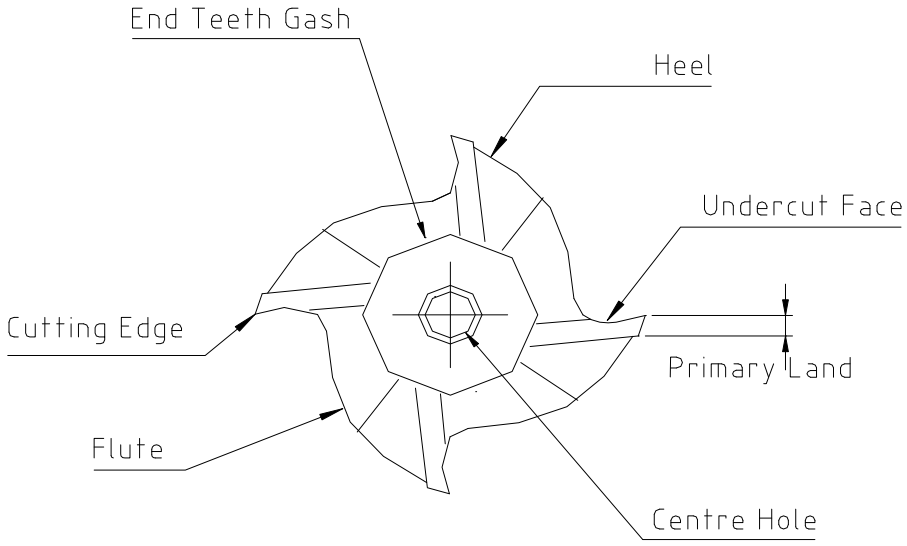
Shank Types

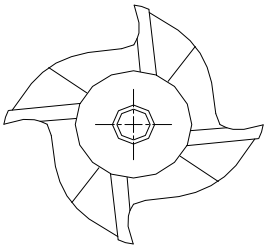
BS 122 Part 4
Screwed Shank
Suitable for use in chucks



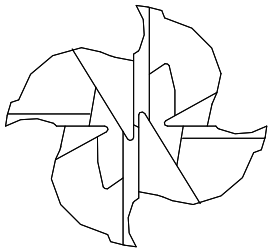
ISO
Plain Shank
Suitable for use with collets

CUTTER Nomenclature

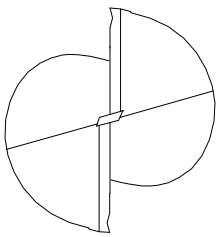




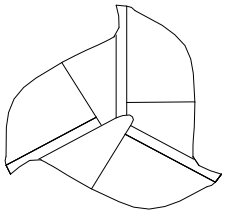
Standard End Mill
End teeth approx
1/4 of diameter in length



END Mill Two teeth cut to centre
End mills up to 12mm and ripping
cuters up to 32mm



Standard Slot Drill
One tooth cut through centre
for plunge cutting in axial feed



TRI-Cutter 3 Flute Slot Drill
One tooth ground to centre for
Plunge cutting in Axial feed

MILLING PRACTICE

The ease with which material can be milled is dependant on several factors including tensile strength and abrasion resistance. These may be assessed from the hardness tests, material composition and known heat treatment. Whilst hardness and /or strength is the usual criterion, wide variations in machinability can exist among materials showing very similar physical properties.

The cutting conditions used can be dependant upon requirements for tool life and surface finish and further restrictions by rigidity of tool and workpiece, lubrication and machine power available.

In general the harder the material the lower the cutting speed, but some materials of relatively low hardness contain abrasive constituents leading to rapid cutting edge wear at high speeds. Feed rates are governed by rigidity of set up, width of cut , i.e. volume of metal removed, surface finish required, and the available power. Conventional or climb milling can also effect the life and finish from the cutter.

Taking the above into account, therefore no one set of speeds and feeds is necessarily correct for a given material. It is usually preferable to set and maintain a constant surface speed for a given material and vary the feed rate within defined limits to obtain the desired life and finish.

Machine feed is measured in mm per minute and is the product of RPM x the number of teeth in the cutter x Feed per Tooth.

All machine feed should be worked back to the recommended feed per tooth. Too light a cut may fail to penetrate work hardening materials and cause edge breakdown, too heavy feeds will cause chipping and excessive heat generation. Slender and long shanked cutters are restricted in feed rate due to deflection of the cutter, where ever possible the largest and most robust tool should be used. This is particularly important to material over 250 Hb. Over 300Hb then Cobalt HSSE -Co8 cutters should be used. For softer materials Cobalt cutters may give increased output by increasing speeds and Feeds up to 50%

The following charts are a guide only and the final conditions should be established by application.

FORMULA FOR MILLING CALCULATIONS

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D = Diameter of Cutter in mm
z = number of teeth in cutter
n = spindle speed in revolutions / min
V_f = Cutter feed or table traverse in mm
f_z = Feed per tooth in mm
V_c = cutting speed in Meters / minute
π = 3.1416

Cutting speed Vc = $\frac{D \times \pi \times n}{1000}$ in meters / min

Spindle Speed n = $\frac{Vc \times 1000}{\pi \times D}$ in RPM

Feed Per Tooth fz = $\frac{Vf \quad .}{z \times n}$ in mm

Cutter Feed Vf = fz x z x n in mm
or Table Traverse

FEED PER TOOTH for END MILLS
The charts from page 48 give End Mill feeds per tooth (fz) for 1/4 diameter radial cut with 1 diameter in axial depth
To increase the axial depth to :-
1½ diameters deep reduce feed to 70%
2 diameters deep reduce feed by 50%

To modify radial depth to :-
1/2 Diameter reduce feed by 50%
1/8 Diameter increase feed by 50%

FEED PER TOOTH for SLOT DRILLS
The charts from page 50 give Slot Drill feed per tooth (fz) for 1/2 diameter axial depth of cut full slot width
To increase axial depth to full diameter reduce feed by 50%

FEED PER TOOTH for all LONG SERIES cutters should be reduced by 50%.
Large axial and radial depths on small diameter or long cutters may cause deflection

HINTS ON MILLING

PRESTO INTERNATIONAL LIMITED

As in most machining operations optimum performance is controlled by the following;-

(1) Rigidity of set up, use the most robust tool. Where this cannot be done, feeds and speeds must be reduced. Avoid large overhang of shank cutters. Adequately clamp cutter for both movement and chatter
(2) Speeds**,** feeds and lubrication, consult the charts and adapt to suit workshop conditions, no coolant requires a reduction to the speed by up to 50%
(3)Tool maintenance. Check tool shanks and machine chucks or arbors for dirt, scoring or damage before mounting the tool. Tools with these faults will run eccentrically giving poor finish, inaccuracy, and poor tool life.

MILLING PROBLEMS

(1) Tool Breaks
(a) Incorrectly mounted**,** running eccentrically
(b) Excessive overhang, consider shorter tool
(c) Workpiece inadequately clamped
(d) Excessive Feed or table running with cutter stalling
(e) Cutter chipped or worn. See page 47
(f) swarf not clearing, consider different design or spiral of cutter
(g) Cutter too light for job

2 Short Tool Life
consider items (a), (b), (c), (d)
(h) Speed too high, tool burning out
(I) Feed too light, tool rubbing, consider climb milling
(j) Inadequate lubrication (no coolant, run at half speed)

3 Poor Size
consider items (a), (b), (c), (g)
(k) Machine in poor condition.
If giving slot lean on slot drilling, try using a tri-cutter

4 Poor Finish
Consider items (a), (b), (c), (d), (j), (k)
Look for one tooth doing all the work, consider climb milling

Climb milling is where the cutter, cuts from the thick side of the chip to thin. The cutter tending to pull the workpiece into the cut, previously always avoided but modern machines can cope with this mode of cut.

RE-SHARPENING

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Regular light re-sharpening is important for consistent performance. Shank type cutters are usually reconditioned by sharpening the end teeth relief and the clearance surfaces of the peripheral teeth. Up to 10mm diameter are considered disposable tools

On slot drills it is necessary to remove all the wear by cutting back the end teeth to maintain the cutter size. The alternative is to lip glaze up the flute taking away the wear land as indicated below

When regrinding relief on end teeth, angles should be restored to the original values these are typically
Primary 6° and Secondary 12°

Re-grinding body teeth the angles are typically
up to 2mm Primary 23° No secondary
over 2 up to 6mm Primary 17° No secondar y
over 6mm up to 10mm Primary 14° optional 22°
over 10mm up to 16mm Primary 12° secondary 25°
over 16mm Primary 6° secondary 12°
Or an archimedean cam relief can replace both.

When to Regrind

When a wear land appears on the cutter, suggested amount:-
0.1mm (0.004") on up to 10mm (3/8") diameter cutters
0.15mm (0.006") on up to 20mm (3/4") diameter cutters
0.2mm (0.008") on up to 25mm (1") diameter cutters
0.025mm (0.010") on 32mm (1-1/4")and over cutters
Greater than these wear lands may lead to broken cutters

If the power consumption goes up, regrinding is required.

Size in a slot is lost (P9 tolerance)

When the surface finish starts to deteriorate

Large burrs start to appear on edge of cut

If the swarf starts to turn blue.

When noise and smoke start to appear it is usually too late to save the cutter for re-grinding

PRESTO INTERNATIONAL LIMITED

END MILLS SPEEDS & FEEDS HSS Cutters

Depth of Cut = Diameter Width of cut = 1/4 Diameter

Material	Aluminium			BRASS			CAST IRON			MILD STEEL 120Hb			Low Carbon STEEL 200Hb			ALLOY STEEL 250Hb			
Speed **M**	**60**	feed/	Feed	**55**	feed/	Feed	**22**	feed/	Feed	**30**	feed/	Feed	**25**	feed/	Feed	**15**	feed/	Feed	
Diam	RPM	tooth	mm	RPM	tooth	mm	RPM	tooth	mm	RPM	tooth		RPM	tooth	mm	RPM	tooth	mm	inch
2	9549	0.002	76	8754	0.002	70	3501	0.002	28	4775	0.002	38	3979	0.002	32	2387	0.002	19	5/64
3	6366	0.003	76	5836	0.003	70	2334	0.005	47	3183	0.006	76	2653	0.006	64	1592	0.004	25	1/8
5	3820	0.008	122	3501	0.007	98	1401	0.008	45	1910	0.020	153	1592	0.020	127	955	0.016	61	5/32
6	3183	0.011	140	2918	0.020	233	1167	0.021	98	1592	0.025	159	1326	0.025	133	796	0.020	64	1/4
8	2387	0.020	191	2188	0.030	263	875	0.032	112	1194	0.036	172	995	0.036	143	597	0.030	72	5/16
10	1910	0.030	229	1751	0.060	420	700	0.042	118	955	0.048	183	796	0.048	153	477	0.042	80	3/8
12	1592	0.050	318	1459	0.070	408	584	0.052	121	796	0.060	191	663	0.060	159	398	0.052	83	1/2
16	1194	0.080	382	1094	0.085	372	438	0.068	119	597	0.075	179	497	0.075	149	298	0.068	81	5/8
20	955	0.100	382	875	0.090	315	350	0.075	105	477	0.085	162	398	0.085	135	239	0.075	72	3/4
25	764	0.110	504	700	0.110	462	280	0.080	134	382	0.100	229	318	0.100	191	191	0.080	92	1"
32	597	0.125	448	547	0.110	361	219	0.090	118	298	0.100	179	249	0.100	149	149	0.085	76	1¼
40	477	0.130	372	438	0.130	341	175	0.100	105	239	0.110	158	199	0.110	131	119	0.095	68	1½
50	382	0.130	298	350	0.130	273	140	0.100	84	191	0.110	126	159	0.110	105	95	0.095	54	2"

Long series cutters use half the feed rates

For 8% cobalt cutters use above at 1.33 x RPM and FEED use same feed/tooth

COBALT 8% END MILLS FEEDS & SPEEDS

PRESTO INTERNATIONAL LIMITED

Depth of Cut = Diameter. Width of cut = 1/4Diameter

Material	Alloy Steel 300HB			Alloy Steel 350Hb			Stainless Free Cut Ferritic			Stainless Austenitic §			Titanium Alloy 300Hb §			Nickel Alloy Nimonic 250Hb §			
Speed **M**	**15**	feed/	Feed	**10**	feed/	Feed	**25**	feed/	Feed	**15**	feed/	Feed	**9**	feed/	Feed	**8**	feed/	Feed	
Diam.	RPM	tooth	mm	RPM	tooth	mm	RPM	tooth	mm	RPM	tooth		RPM	tooth	mm	RPM	tooth	mm	inch
2	2387	0.003	29	1592	0.003	19	3979	0.003	48	2387	0.003	29	1432	0.003	17	1273	0.002	10	5/64
3	1592	0.005	32	1061	0.005	21	2653	0.005	53	1592	0.005	32	955	0.005	19	849	0.004	14	1/8
5	955	0.010	38	637	0.010	25	1592	0.008	51	955	0.008	31	573	0.008	18	509	0.007	14	5/32
6	796	0.016	51	531	0.016	34	1326	0.021	111	796	0.018	57	477	0.018	34	424	0.012	20	1/4
8	597	0.025	60	398	0.025	40	995	0.032	127	597	0.027	64	358	0.027	39	318	0.018	23	5/16
10	477	0.035	67	318	0.035	45	796	0.042	134	477	0.037	71	286	0.037	42	255	0.026	26	3/8
12	398	0.045	72	265	0.045	48	663	0.052	138	398	0.045	72	239	0.045	43	212	0.035	30	1/2
16	298	0.060	72	199	0.060	48	497	0.068	135	298	0.060	72	179	0.060	43	159	0.050	32	5/8
20	239	0.070	67	159	0.070	45	398	0.075	119	239	0.072	69	143	0.072	41	127	0.058	30	3/4
25	191	0.070	80	127	0.070	53	318	0.080	153	191	0.080	92	115	0.080	55	102	0.065	40	1"
32	149	0.080	72	99	0.080	48	249	0.090	134	149	0.080	72	90	0.080	43	80	0.065	31	1¼
40	119	0.090	64	80	0.090	43	199	0.100	119	119	0.090	64	72	0.090	39	64	0.070	27	1½
50	95	0.090	52	64	0.090	34	159	0.100	95	95	0.090	52	57	0.090	31	51	0.070	21	2"

Long series cutters use half the feed rates

§ Special PMC cutters with a higher spiral angle will give better results on difficult Stainless, Titanium and Nickel

SLOT DRILLS SPEEDS & FEEDS HSS Cutters

PRESTO INTERNATIONAL LIMITED

Depth of Cut = ½Diameter Width of cut = Diameter

Material	Aluminium			BRASS			CAST IRON			MILD STEEL 120Hb			Low Carbon STEEL 200Hb			ALLOY STEEL 250Hb			
Speed **M**	**60**	feed/	Feed	**55**	feed/	Feed	**22**	feed/	Feed	**30**	feed/	Feed	**25**	feed/	Feed	**15**	feed/	Feed	
Diam	RPM	tooth	mm	RPM	tooth	mm	RPM	tooth	mm	RPM	tooth		RPM	tooth	mm	RPM	tooth	mm	inch
2	9549	0.003	57	8754	0.003	53	3501	0.003	21	4775	0.003	29	3979	0.003	24	2387	0.002	10	5/64
3	6366	0.005	64	5836	0.005	58	2334	0.009	42	3183	0.007	45	2653	0.007	37	1592	0.005	16	1/8
5	3820	0.012	92	3501	0.011	77	1401	0.015	42	1910	0.015	57	1592	0.015	48	955	0.013	25	5/32
6	3183	0.032	204	2918	0.030	175	1167	0.027	63	1592	0.023	73	1326	0.023	61	796	0.021	33	1/4
8	2387	0.050	239	2188	0.045	197	875	0.042	74	1194	0.036	86	995	0.036	72	597	0.032	38	5/16
10	1910	0.085	325	1751	0.060	210	700	0.060	84	955	0.048	92	796	0.048	76	477	0.042	40	3/8
12	1592	0.100	318	1459	0.070	204	584	0.072	84	796	0.060	95	663	0.060	80	398	0.052	41	1/2
16	1194	0.125	298	1094	0.085	186	438	0.080	70	597	0.075	90	497	0.075	75	298	0.068	41	5/8
20	955	0.135	258	875	0.090	158	350	0.080	56	477	0.088	84	398	0.088	70	239	0.072	34	3/4
25	764	0.170	260	700	0.110	154	280	0.090	50	382	0.100	76	318	0.100	64	191	0.090	34	1"
32	597	0.175	209	547	0.110	120	219	0.090	39	298	0.100	60	249	0.100	50	149	0.090	27	1¼
40	477	0.180	172	438	0.130	114	175	0.100	35	239	0.110	53	199	0.110	44	119	0.100	24	1½
50	382	0.180	138	350	0.130	91	140	0.100	28	191	0.110	42	159	0.110	35	95	0.100	19	2"

Long series cutters use half the feed rates

For 8% cobalt cutters use above at 1.33 x RPM and FEED use same feed/tooth

PRESTO
INTERNATIONAL LIMITED

COBALT 8% SLOT DRILLS FEEDS & SPEEDS

Depth of Cut = ½Diameter Width of cut = Diameter

Material	Alloy Steel 300HB			Alloy Steel 350Hb			Stainless Free Cut Ferritic			Stainless Austenitic §			Titanium Alloy 300Hb §			Nickel Alloy Nimonic 250Hb §			
Speed **M**	**15**	feed/	Feed	**10**	feed/	Feed	**25**	feed/	Feed	**15**	feed/	Feed	**9**	feed/	Feed	**8**	feed/	Feed	
Diam	RPM	tooth	mm	RPM	tooth	mm	RPM	tooth	mm	RPM	tooth		RPM	tooth	mm	RPM	tooth	mm	inch
2	2387	0.003	14	1592	0.003	10	3979	0.003	24	2387	0.003	14	1432	0.003	9	637	0.003	4	5/64
3	1592	0.009	29	1061	0.009	19	2653	0.009	48	1592	0.009	29	955	0.007	13	424	0.007	6	1/8
5	955	0.017	32	637	0.017	22	1592	0.015	48	955	0.012	23	573	0.012	14	255	0.012	6	5/32
6	796	0.025	40	531	0.025	27	1326	0.027	72	796	0.018	29	477	0.020	19	212	0.020	8	1/4
8	597	0.040	48	398	0.040	32	995	0.042	84	597	0.020	24	358	0.030	21	159	0.030	10	5/16
10	477	0.050	48	318	0.050	32	796	0.060	95	477	0.040	38	286	0.037	21	127	0.037	9	3/8
12	398	0.060	48	265	0.060	32	663	0.072	95	398	0.055	44	239	0.045	21	106	0.045	10	1/2
16	298	0.075	45	199	0.075	30	497	0.080	80	298	0.072	43	179	0.060	21	80	0.060	10	5/8
20	239	0.080	38	159	0.080	25	398	0.080	64	239	0.080	38	143	0.072	21	64	0.072	9	3/4
25	191	0.090	34	127	0.090	23	318	0.090	57	191	0.080	31	115	0.080	18	51	0.080	8	1"
32	149	0.090	27	99	0.090	18	249	0.090	45	149	0.080	24	90	0.080	14	40	0.080	6	1¼
40	119	0.095	23	80	0.095	15	199	0.100	40	119	0.090	21	72	0.090	13	32	0.090	6	1½
50	95	0.095	18	64	0.095	12	159	0.100	32	95	0.090	17	57	0.090	10	25	0.090	5	2"

Long series cutters use half the feed rates

§ Tri-Cutters with a higher spiral angle will give better results on difficult Stainless, Titanium and Nickel

TEE SLOT CUTTERS SPEEDS & FEEDS HSS Cutters

PRESTO INTERNATIONAL LIMITED

Nominal BOLT SIZE		Material		Aluminium			BRASS			Cast Iron			Mild Steel 120Hb 450N/mm²			Low Carbon Steel 200Hb 700N/mm²			Carbon Steel 250Hb 850N/mm²		
		Head Dia	Teeth Z	**60** RPM	feed/ tooth	Feed mm	**55** RPM	feed/ tooth	Feed mm	**20** RPM	feed/ 'tooth	Feed	**30** RPM	feed/ tooth	Feed mm	**25** RPM	feed/ tooth	Feed mm	**12** RPM	feed/ tooth	Feed mm
6		12.5	6	1528	0.010	92	1401	0.010	84	509	0.007	21	764	0.009	41	637	0.006	8	306	0.004	7
	1/4"	14.7	6	1299	0.010	78	1191	0.010	71	433	0.010	26	650	0.013	51	541	0.009		260	0.006	9
8		16	6	1194	0.010	72	1094	0.010	66	398	0.010	24	597	0.014	50	497	0.011	11	239	0.008	11
10	***5/16"***	19	6	1005	0.010	60	921	0.010	55	335	0.013	26	503	0.016	48	419	0.013	11	201	0.011	13
12	***3/8"***	22	6	868	0.020	104	796	0.020	95	289	0.016	28	434	0.020	52	362	0.018	13	174	0.016	17
14	***7/16"***	25	6	764	0.020	92	700	0.020	84	255	0.025	38	382	0.030	69	318	0.025	16	153	0.022	20
16	***1/2"***	28	8	682	0.020	109	625	0.020	100	227	0.025	45	341	0.030	82	284	0.025	14	136	0.022	24
18		32	8	597	0.030	143	547	0.030	131	199	0.030	48	298	0.035	84	249	0.030		119	0.027	26
	5/8"	34	8	562	0.030	135	515	0.030	124	187	0.030	49	281	0.037	83	234	0.032	15	112	0.030	27
20		36	8	531	0.030	127	486	0.030	117	177	0.030	42	265	0.037	79	221	0.032	14	106	0.030	25
	3/4"	39	8	496	0.030	119	455	0.030	109	165	0.035	46	248	0.037	73	207	0.032	13	99	0.030	24
22		40	8	477	0.030	115	438	0.030	105	159	0.035	45	239	0.037	71	199	0.032	13	95	0.030	23
	7/8"	43	8	441	0.030	106	404	0.030	97	147	0.035	41	221	0.037	65	184	0.032	12	88	0.030	21
	1"	50	8	382	0.030	92	350	0.030	84	127	0.038	39	191	0.037	57	159	0.032	10	76	0.033	20

USED TO MAKE "T"- SLOTS from pre-machined slots with not more than 0.1mm cut on bottom face

Calculations are made on HEAD diameter and not the nominal BOLT SIZE

DOVETAIL CUTTERS SPEEDS & FEEDS HSS Cutters

PRESTO INTERNATIONAL LIMITED

Material			Aluminium			BRASS			Cast Iron			Mild Steel 120Hb			Low Carbon Steel 200Hb			Carbon Steel 250Hb		
Speed **M**			**60** meters/min			**55** meters/min			**20** meter/min			**30** meter/min			**25** meters/min			**12** meter/min		
mm. Dia	inch	Teeth Z	RPM	feed/ tooth	Feed mm	RPM	feed/ tooth	Feed mm	RPM	feed/ 'tooth	Feed	RPM	feed/ tooth	Feed mm	RPM	feed/ tooth	Feed mm	RPM	feed/ tooth	Feed mm
13	*1/2"*	6	1469	0.020	176	1347	0.020	162	490	0.025	73	735	0.020	88	612	0.020	24	294	0.020	35
16		6	1194	0.020	143	1094	0.020	131	398	0.030	72	597	0.025	90	497	0.025	25	239	0.025	36
20	*3/4"*	6	955	0.030	172	875	0.030	158	318	0.035	67	477	0.030	86	398	0.030	24	191	0.030	34
22	*7/8"*	6	868	0.035	182	796	0.035	167	289	0.035	61	434	0.035	91	362	0.035	25	174	0.035	36
25	*1"*	6	764	0.035	160	700	0.035	147	255	0.040	61	382	0.040	92	318	0.040	25	153	0.040	37
28	*1-1/8"*	6	682	0.040	164	625	0.040	150	227	0.040	55	341	0.040	82	284	0.040	23	136	0.040	33
32	*1-1/4"*	8	597	0.050	179	547	0.050	164	199	0.050	60	298	0.045	81	249	0.045	22	119	0.045	32
35	*1-3/8"*	8	546	0.055	180	500	0.055	165	182	0.055	60	273	0.055	90	227	0.050	23	109	0.050	33
38	*1-1/2"*	8	503	0.060	181	461	0.060	166	168	0.060	60	251	0.060	90	209	0.060	25	101	0.055	33

DEPTH of Cut 80% of Flute Length, Width of Cut 25% of Diameter

COBALT CUTTERS use 1.3 x Speeds and Feed, maintain feed per tooth

HSS, HSS-E Cobalt and HSS-E Vanadium, Materials used to manufacture tools

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Material Type	EN10027-1 Steel Name	DIN	Carbon C.	Chromium Cr.	Molybdenum Mo.	Tungsten W.	Vanadium V.	Cobalt Co.	Material Applications
M2	HS 6-5-2	1.3343	0.90	4.10	5.00	6.40	1.90		Drills, taps & some milling cutters - normal HSS Steel
M35	HS 6-5-2-5	1.3243	0.92	4.10	5.00	6.40	1.90	4.80	DIN Taps Reamers & milling cutters a tough Cobalt material
M42	HS 2-10-1-8	1.3247	1.08	4.10	9.50	1.50	1.20	8.00	Cobalt Drills, DIN Cutters & Toolbits Cobalt for a Higher hot hardness.
WKE45	HS 9-4-3-10	(1.3208)	1.40	4.20	3.50	8.50	3.40	11.00	Toolbits only for extreme applications
ASP23 *	HS 6-5-3	1.3342	1.28	4.20	3.20	6.40	3.10		Drills & Taps for added toughness chipping resistance and abrasive wear
ASP30 *	HS 6-5-3-8		1.28	4.20	5.00	6.40	3.10	8.50	Special Drills Taps & Cutters, Chip resisting & higher hot Hardness
ASP60 *	HS 6-7-6-10	(1.3241)	2.30	4.20	7.00	6.50	6.50	10.50	Quality Cutters For extreme applications
PM M4 *	HS 6-5-4		1.40	4.00	5.00	5.50	4.00		ISO PMC Taps & special taps high vanadium for wear resistance
PM T15 *	HS 12-0-5-5	1.3202	1.60	4.00		12.00	5.00	5.00	Special and cobalt taps for extreme applications

* powder metallurgy grades

We don't get PM-T15 now except as a special from USA is ASP2012 approx

WKE45 is super mo-max

SELF TAPPING SCREWS

PRESTO INTERNATIONAL LIMITED

Drill sizes for use with Hardened Steel Type Self Tapping Screws for fastening sheet metal. All drill sizes are approximate

Screw size	Material Thickness Inch	MM	SWG	Drill Diameter
No2	0.018	0.45	26	**1.60**
(0.086")	0.036	0.91	20	**1.85**
2.2mm	0.064	1.62	16	**1.95**
No 4	0.018	0.45	26	**2.05**
(0.112")	0.036	0.91	20	**2.30**
or	0.064	1.62	16	**2.40**
2.9mm	0.080	2.03	14	**2.60**
No6	0.018	0.45	26	**2.35**
(0.138")	0.036	0.91	20	**2.80**
or	0.064	1.62	16	**2.95**
3.5mm	0.080	2.03	14	**3.10**
	0.104	2.64	12	**3.20**
No8	0.028	0.71	22	**2.90**
(0.164")	0.036	0.91	20	**3.10**
or	0.064	1.22	18	**3.20**
4.2mm	0.080	1.62	16	**3.40**
	0.104	2.64	12	**3.70**
	0.125	3.18	1/8"	**3.80**
No 10	0.028	0.71	22	**3.40**
(0.186")	0.048	1.22	18	**3.60**
or	0.064	1.62	16	**3.80**
4.8mm	0.104	2.64	12	**4.10**
	0.125	3.18	1/8"	**4.30**
	0.187	4.75	3/16"	**4.50**
No12	0.028	0.71	22	**4.10**
(0.212")	0.048	1.22	18	**4.30**
or	0.064	1.62	16	**4.50**
5.5mm	0.104	2.64	12	**4.80**
	0.125	3.18	1/8"	**4.90**
	0.187	4.75	3/16"	**5.10**
No14	0.048	1.22	18	**4.80**
(0.242")	0.064	1.62	16	**5.20**
	0.125	3.18	1/8"	**5.40**
	0.187	4.75	3/16"	**5.70**
	0.036	0.91	20	**5.00**
6.3mm	0.048	1.22	18	**5.20**
	0.060	1.52		**5.80**
	0.075	1.90		**5.90**

The drill diameter varies with the thickness of material being drilled. For Aluminium and similar soft materials decrease the drill diameter by 0.1mm or 5% of diameter on No10 and larger screws

Using the larger drill size on thin materials will result in stripped threads. Using the smallest drill in thick materials will need very high torque values to drive the screw and can result in the head shearing off the screw.

Note that British Standard Wire Gauge as used to describe sheet metal thickness has no relation to the "ANSI" Number drills listed in the decimal equivalent chart.

No14 and 6.3 metric screws are not interchangeable in the drill sizes, so we have not amalgamated the listings