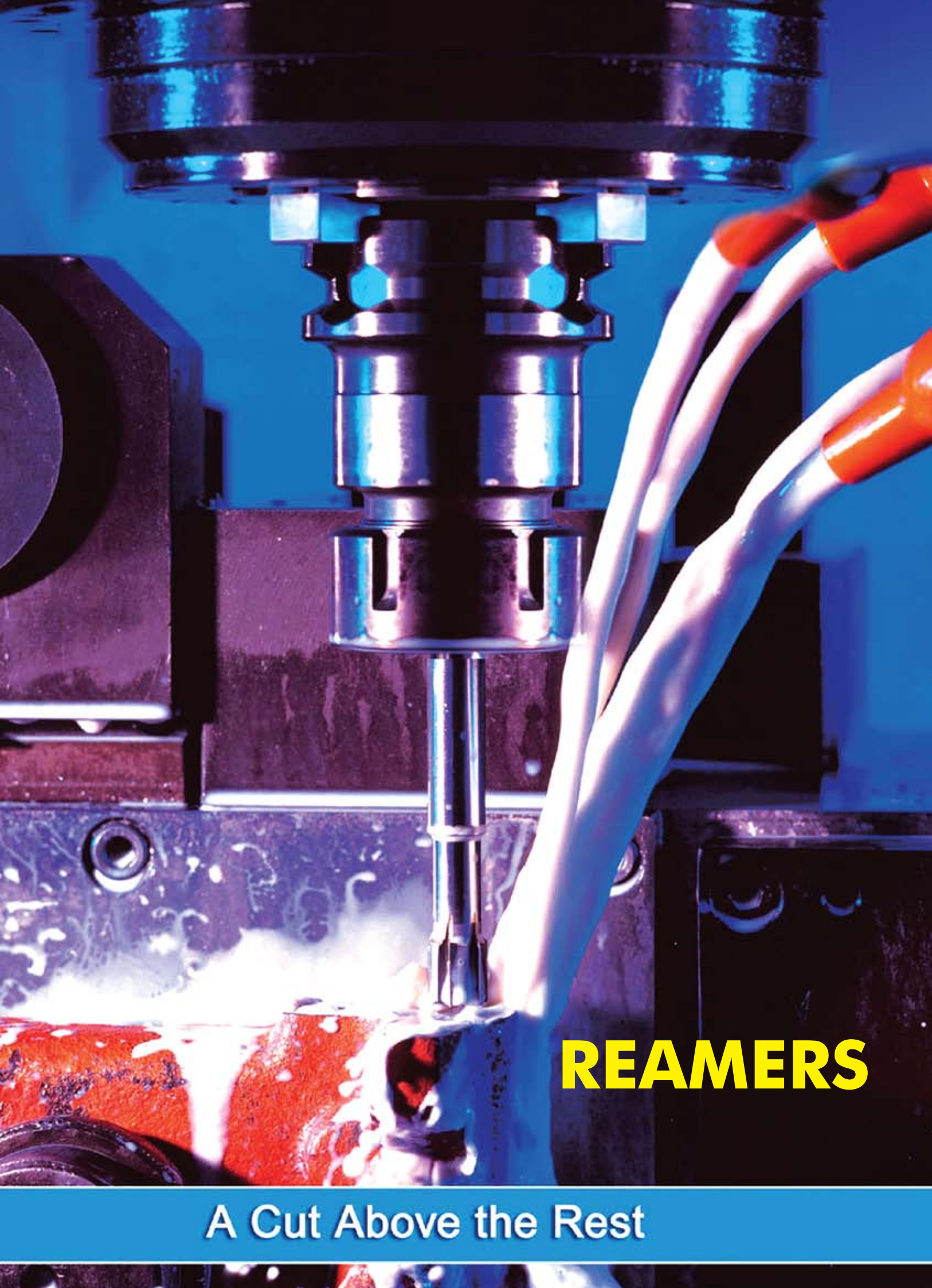


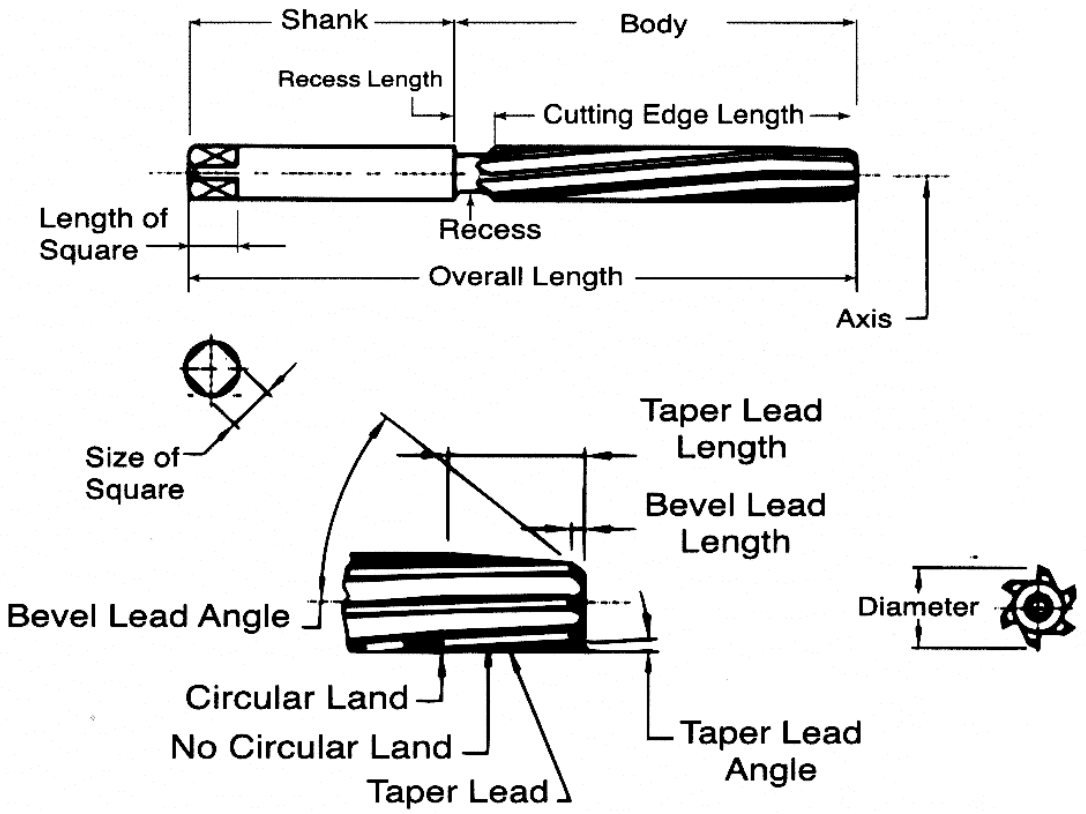
REAMERS

A Cut Above the Rest

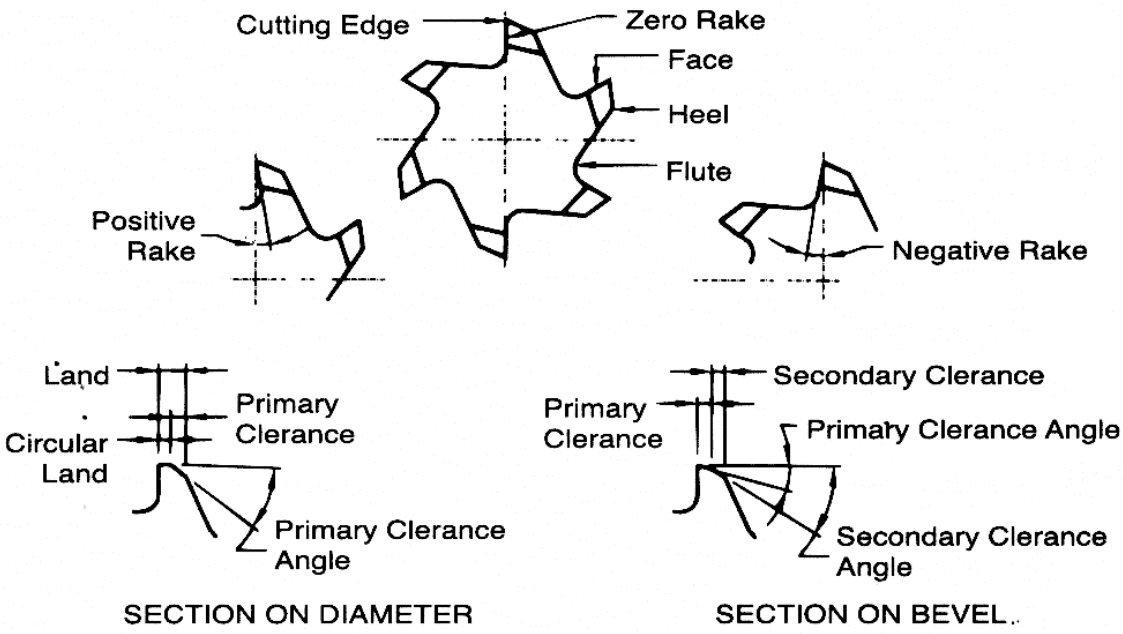
CONTENTS

REAMERS - NOMENCLATURE

TERMS RELATING TO REAMERS



TERMS RELATING TO CUTTING GEOMETRY OF REAMERS



High Speed Steel
PARALLEL HAND REAMERS

Specifications Conform to :
IS 5444 - 1978.
ISO 236/1 - 1976
DIN 206 - 1979
BS 328 : Part 4 : 1983.
Dimensions in mm / Inch

Diameters		Cutting Edge Length	Overall Length
mm	Inch		
3.0	-	31	62
-	1/8	33	66
3.5	-	35	71
4.0	5/32	38	76
4.5	-	41	81
5.0	3/16	44	87
5.5	7/32	47	93
6.0	-	47	93
-	1/4	50	100
7.0	9/32	54	107
8.0	5/16	58	115
9.0	11/32	62	124
10.0	3/8,13/32	66	133
11.0	7/16	71	142
12.0	15/32	76	152
13.0	1/2	76	152
14.0	9/16	81	163
15.0	-	81	163
16.0	5/8	87	175
17.0	-	87	175
18.0	11/16	93	188
19.0	-	93	188

Diameters		Cutting Edge Length	Overall Length
mm	Inch		
20.0	3/4	100	201
21.0	13/16	100	201
22.0	7/8	107	215
23.0	-	107	215
24.0	15/16	115	231
25.0	1	115	231
26.0	-	115	231
27.0	1.1/16	124	247
28.0	1.1/8	124	247
30.0	-	124	247
32.0	1.3/16,1.1/4,1.5/16	133	265
34.0	-	142	284
35.0	1.3/8	142	284
36.0	1.7/16	142	284
38.0	1.1/2	152	305
40.0	-	152	305
42.0	1.5/8	152	305
44.0	1.3/4	163	326
45.0		163	326
46.0	-	163	326
48.0	1.7/8	174	347
50.0	2	174	347

A Reamer having virtually parallel cutting edges, with taper & bevel lead integral with a parallel shank of the nominal diameter of the cutting edges, and with a driving square on the end of the shank.

LH Helical flutes for RH cutting shall be supplied unless otherwise specified.

High Speed Steel
PARALLEL HAND REAMERS

Specifications Conform to :
IS 5444 - 1978.
ISO 236/1 - 1976
DIN 206 - 1979
BS 328 : Part 4 : 1983
Dimensions in mm / Inch

Diameters		Cutting Edge Length	Overall Length
mm	Inch		
52.00	2.1/16	174	347
55.00	2.1/8	184	367
56.00	2.3/16	184	367
58.00	2.1/4	184	367
60.00	2.5/16	184	367
62.00	2.3/8, 2.7/16	194	387
63.00	2.1/2	194	387
67.00	-	194	387
71.00	-	203	406

Tolerance on Reamer diameters is 'm6' for IS, ISO & BS Standards. 'm6' tolerance is expected to produce 'H8' holes. For DIN Standard, Reamer size is to be calculated to suit 'H7' holes.

High Speed Steel
LONG FLUTE MACHINE REAMERS

Specifications Conform to
IS 5445 - 1978.
ISO 236/11 - 1976
DIN 206 - 1979
BS 328 : Part 4 : 1983
Dimensions in mm / Inch

Diameter		Cutting Edge-length	Overall Length	Morse Taper No.
mm	Inch			
3.00	-	31.00	111	1
-	1/8	33.00	113	1
4.00	5/32	38.00	118	1
5.00	3/16	44.00	124	1
6.00	-	47.00	127	1
-	1/4	50.00	130	1
7.00	9/32	54.00	134	1
8.00	5/16	58.00	138	1
9.00	11/32	62.00	142	1
10.00	3/8,13/32	66	146	1
11.00	7/16	71	151	1
12.00	15/32	76	156	1
13.00	1/2	76	156	1
14.00	-	81	161	1
15.00	9/16	81	181	2
16.00	5/8	87	187	2
17.00	-	87	187	2
18.00	11/16	93	193	2
19.00	-	93	193	2
20.00	3/4	100	200	2
21.00	13/16	100	200	2
22.00	7/8	107	207	2
23.00	-	107	207	2
24.00	15/16	115	242	3
25.00	1	115	242	3
26.00	-	115	242	3

Diameter		Cutting Edge length	Overall Length	Morse Taper No.
mm	Inch			
27.00	1.1/16	124	251	3
28.00	1.1/8	124	251	3
30.00	-	124	251	3
-	1.3/16,1.1/4	133	260	3
32.00	1.5/16	133	293	4
34.00	-	142	302	4
35.00	1.3/8	142	302	4
36.00	1.7/16	142	302	4
38.00	1.1/2	152	312	4
40.00	-	152	312	4
42.00	1.5/8	152	312	4
44.00	-	163	323	4
45.00	1.3/4	163	323	4
46.00	-	163	323	4
48.00	1.7/8	174	334	4
50.00	2	174	334	4
52.00	-	174	371	5
55.00	-	184	381	5
56.00	-	184	381	5
58.00	2.1/4	184	381	5
60.00	-	184	381	5
62.00	-	194	391	5
63.00	2.1/2	194	391	5
67.00	-	194	391	5
71.00	-	203	400	5
-	3	212	409	5

A Reamer having virtually parallel cutting edges, with bevel lead, integral with a Morse Taper Shank

LH Helical Flutes for RH Cutting shall be supplied unless otherwise specified.
Reamers with 'm6' tolerance are expected to produce 'H8' Holes

High Speed Steel
MACHINE JIG REAMERS

Specifications Conform to IS 11002 - 1984.
Dimensions in mm

Diameter m6 mm	Cutting Edge Length	Overall Length	Morse Taper No.
6.0	26	138	1
7.0	31	150	1
8.0	33	156	1
9.0	36	162	1
10.0	38	168	1
11.0	41	175	1
12.0	44	182	1
13.0	44	182	1
14.0	47	189	1
15.0	50	204	2
16.0	52	210	2
17.0	54	214	2
18.0	56	219	2
19.0	58	223	2
20.0	60	228	2
22.0	64	237	2
24.0	68	268	3

Diameter m6 mm	Cutting Edge Length	Overall Length	Morse Taper No.
25.0	68	268	3
26.0	70	273	3
28.0	71	277	3
30.0	73	281	3
32.0	77	317	4
34.0	78	321	4
35.0	78	321	4
36.0	79	325	4
38.0	81	329	4
40.0	81	329	4
42.0	82	333	4
44.0	83	336	4
45.0	83	336	4
46.0	84	340	4
48.0	86	344	4
50.0	86	344	4

A Reamer having short , virtually parallel, cutting edges with bevel lead and a guide between the shank and cutting edges, integral with a Morse Taper Shank.

LH Helical Flutes for RH Cutting shall be supplied unless otherwise specified.
Reamers with 'm6' tolerance are expected to produce 'H8' Holes.

High Speed Steel
MACHINE JIG REAMERS

Specifications Conform to:
BS 122 : Part 2 : 1964
Dimensions in mm/Inch

Diameter m6	Cutting Edge Length	Overall Length	Morse Taper No
1/4	7/8	5.5/8	1
5/16	1	5.15/16	1
3/8	1.1/8	6.1/4	1
7/16	1.5/16	6.11/16	1
1/2	1.5/16	6.11/16	1
9/16	1.1/2	7.13/16	2
5/8	1.1/2	7.13/16	2
11/16	1.3/4	8.7/16	2
3/4	1.3/4	8.7/16	2
13/16	1.3/4	8.7/16	2
7/8	2	8.7/8	2
15/16	2	9.15/16	3
1	2	9.15/16	3

Diameter m6	Cutting Edge Length	Overall Length	Morse Taper No
1.1/6	2.3/8	10.3/4	3
1.1/8	2.3/8	10.3/4	3
1.3/16	2.3/8	10.3/4	3
1.1/4	2.3/8	10.3/4	3
1.5/16	2.3/8	12	4
1.3/8	2.3/4	13.1/8	4
1.7/16	2.3/4	13.1/8	4
1.1/2	2.3/4	13.1/8	4
1.5/8	2.3/4	13.1/8	4
1.3/4	3.1/8	14.5/16	4
1.7/8	3.1/8	14.5/16	4
2	3.1/8	14.5/16	4

LH Helical Flutes for RH Cutting shall be supplied unless otherwise specified.
Reamers with 'm6' tolerance are expected to produce 'H8' Holes.

High Speed Steel CHUCKING REAMERS WITH PARALLEL SHANK

Specifications Conform to:
IS 5446 - 1978
ISO 521 - 1975
BS 328 : Part 4 : 1983
DIN 212 : Part 1 : 1979 (Type A)
DIN 212 : Part 2 : 1981 (Type C)
Dimensions in mm / Inch

Diameter		Dia of Shank	Cutting Edge Length	Overall Length
mm	inch			
3.0	-	3.0	15	61
-	1/8	3.175	16	65
3.2	-	3.2	16	65
3.5	-	3.5	18	70
4.0	5/32	4.0	19	75
4.5	-	4.5	21	80
5.0	3/16	5.0	23	86
5.5	7/32	5.6	26	93
6.0	-	5.6	26	93
-	1/4	6.3	28	101
7.0	9/32	7.1	31	109
8.0	5/16	8.0	33	117

Diameter		Dia of Shank	Cutting Edge Length	Overall Length
mm	inch			
9.0	11/32	9.0	36	125
10.0		10.0	38	133
11.0	7/16	10.0	41	142
12.0	15/32	10.0	44	151
13.0	1/2	10.0	44	151
14.0	-	12.5	47	160
15.0	9/16	12.5	50	162
16.0	5/8	12.5	52	170
17.0	-	14.0	54	175
18.0	-	14.0	56	182
19.0	-	16.0	58	189
20.0	-	16.0	60	195

Tolerance on Reamer diameter is 'm6' for IS, ISO & BS Standards. 'm6' tolerances is expected to produce 'H8' Holes. For DIN standard, Reamer size is to be calculated to suit 'H7' holes.

A reamer having short, virtually parallel cutting edges, with bevel lead, integral with a parralel shank.

Straight Flutes for RH Cutting shall be supplied unless otherwise specified.

High Speed Steel CHUCKING REAMERS WITH TAPER SHANK

Specifications Conform to
IS 5447 - 1978
ISO 521 : 1975
DIN 208 : 1981 (TYPE A)
BS 328 : Part 4 : 1983
Dimensions in mm / Inch

Diameter		Cutting Edge length	Overall Length	Morse Taper No
mm	inch			
3.0	-	15	122	1
3.2	-	16	124	1
3.5	-	18	126	1
4.0	5/32	19	128	1
4.5	-	21	130	1
5.0	3/16	23	133	1
5.5	-	26	138	1
6.0	-	26	138	1
-	1/4	28	144	1
7.0	-	31	150	1
8.0	5/16	33	156	1
9.0	-	36	162	1
10.0	3/8	38	168	1
11.0	7/16	41	175	1
12.0	-	44	182	1
13.0	1/2	44	182	1
14.0	-	47	189	1
15.0	9/16	50	204	2
16.0	5/8	52	210	2
17.0	-	54	214	2
18.0	11/16	56	219	2
19.0	-	58	223	2

Diameter		Cutting Edge length	Overall Length	Morse Taper No
mm	inch			
20.0	3/4	60	228	2
-	13/16.	62	232	2
22.0	7/8.	64	237	2
24.0	15/16.	68	268	3
25.0	-	68	268	3
26.0	1	70	273	3
28.0	1,1/16	71	277	3
30.0	1,1/8	73	281	3
-	1,3/16	75	285	3
-	1.1/4	77	290	3
32.0	1,5/16	77	317	4
34.0	-	78	321	4
35.0	1,3/8	78	321	4
36.0	1,7/16	79	325	4
38.0	1,1/2	81	329	4
40.0	-	81	329	4
42.0	1,5/8	82	333	4
44.00	-	83	336	4
45.00	1,3/4	83	336	4
46.00	-	84	340	4
48.00	1,7/8	86	344	4
50.00	2	86	344	4

Tolerance on Reamers is 'm6' for IS, ISO & BS Standards. 'm6' tolerances is expected to produce H8' Holes. For DIN standard, Reamer size is to be calculated to suit 'H7' holes.

A reamer with short, virtually parallel cutting edges, with bevel lead & along body recess between shank and cutting edges integral with Morse Taper Shank.

Straight Flutes for RH Cutting shall be supplied unless otherwise specified.

High Speed Steel
SHELL REAMERS

Specifications Conform to:
IS 5926 - 1970
ISO 2402 - 1972
DIN 219 - 1981 (TYPE A)
Dimensions in mm

Diameter	Large End Dia of Taper Bore	Cutting Edge Length	Overall Length
21	10	28	40
22	10	28	40
23	10	28	40
24	13	32	45
25	13	32	45
26	13	32	45
27	13	32	45
28	13	32	45
29	13	32	45
30	13	32	45
31	16	36	50
32	16	36	50
33	16	36	50
34	16	36	50
35	16	36	50
36	19	40	56
37	19	40	56
38	19	40	56
39	19	40	56
40	19	40	56
41	19	40	56
42	19	40	56

Diameter	Large End Dia of Taper Bore	Cutting Edge Length	Overall Length
43	22	45	63
44	22	45	63
45	22	45	63
46	22	45	63
47	22	45	63
48	22	45	63
49	22	45	63
50	22	45	63
51	27	50	71
52	27	50	71
53	27	50	71
54	27	50	71
55	27	50	71
56	27	50	71
57	27	50	71
58	27	50	71
59	27	50	71
60	27	50	71
61	32	56	80
62	32	56	80
63	32	56	80
64	32	56	80

A short reamer with an axial taper hole generally 1:30 with a cross slot for use on an arbor, and having parallel cutting edges with bevel lead.

Reamers shall be supplied for Right Hand cutting with straight flutes unless otherwise specified

ADDISON

High Speed Steel
SHELL REAMERS

Specifications Conform to
IS 5926 - 1970.
ISO 2402 - 1972
DIN 219 - 1981 (TYPE A)
Dimensions in mm.

Diameter	Large End Dia of Taper Bore.	Cutting Edge Length	Overall Length
65	32	56	80
66	32	56	80
67	32	56	80
68	32	56	80
69	32	56	80
70	32	56	80
71	32	56	80
72	40	63	90
73	40	63	90
74	40	63	90
75	40	63	90
76	40	63	90
77	40	63	90
78	40	63	90
79	40	63	90
80	40	63	90
81	40	63	90
82	40	63	90

Diameter	Large End Dia of Taper Bore.	Cutting Edge Length	Overall Length
83	40	63	90
84	40	63	90
85	40	63	90
86	50	71	100
87	50	71	100
88	50	71	100
89	50	71	100
90	50	71	100
91	50	71	100
92	50	71	100
93	50	71	100
94	50	71	100
95	50	71	100
96	50	71	100
97	50	71	100
98	50	71	100
99	50	71	100
100	50	71	100

Tolerance on Reamer diameter is 'm6' for IS & ISO standards. 'm6' tolerance is expected to produce 'H8' holes. For DIN standard, Reamer size is to be calculated to suit 'H7' holes.

High Speed Steel

SHELL DRILLS

Specifications Conform to :
BS328 : Part 4 : 1983
Dimensions in Inches.

Diameter m6	Cutting Edge Length	Overall Length	Diameter* of large End of Taper Bore
1	2.1/4	2.3/4	0.625
1.1/16	2.1/4	2.3/4	0.625
1.1/8	2.1/4	2.3/4	0.625
1.3/16	2.1/4	2.3/4	0.625
1,1/4	2.1/4	2.3/4	0.625
1.5/16	2.3/8	3	0.750
1.3/8	2.3/8	3	0.750
1.7/16	2.3/8	3	0.750
1.1/2	2.3/8	3	0.750
1.9/16	2.3/8	3	0.750
1.5/8	2.3/8	3	0.750
1.11/16	2.3/4	3.1/2	1.000
1.3/4	2.3/4	3.1/2	1.000
1.13/16	2.3/4	3.1/2	1.000
1.7/8	2.3/4	3.1/2	1.000
1.15/16	2.3/4	3.1/2	1.000
2	2.3/4	3.1/2	1.000
2.1/16	3	3.3/4	1.250
2.1/8	3	3.3/4	1.250

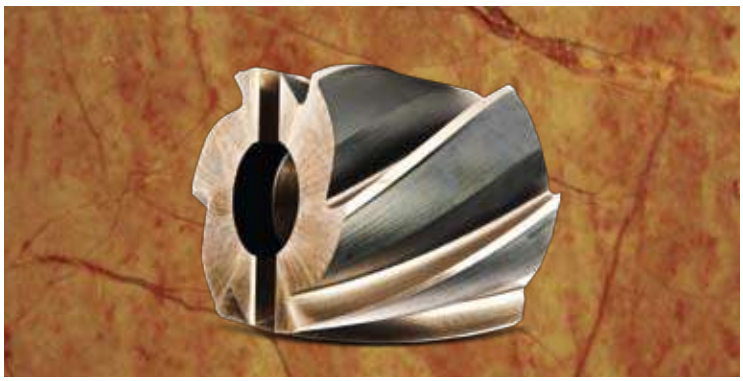
Diameter m6	Cutting Edge Length	Overall Length	Diameter* of large End of Taper Bore
2.3/16	3	3.3/4	1.250
2.1/4	3	3.3/4	1.250
2.5/16	3	3.3/4	1.250
2.3/8	3	3.3/4	1.250
2.7/16	3	3.3/4	1.250
2.1/2	3.1/4	4	1.500
2.5/8	3.1/4	4	1.500
2.3/4	3.1/4	4	1.500
2.7/8	3.1/4	4	1.500
3	3.1/4	4	1.500
3.1/8	3.3/4	4.1/2	1.750
3.1/4	3.3/4	4.1/2	1.750
3.3/8	3.3/4	4.1/2	1.750
3.1/2	3.3/4	4.1/2	1.750
3.5/8	4.1/4	5	2.000
3.3/4	4.1/4	5	2.000
3.7/8	4.1/4	5	2.000
4	4.1/4	5	2.000

* Taper of the bore is 1/8 inch per foot on diameter.

Reamers shall be supplied for Right Hand cutting with Left Hand Helical flutes unless otherwise specified. Reamers with 'm6' tolerance are expected to produce 'H8' Holes.

High Speed Steel
SHELL CORE DRILLS

Specifications Conform to :
IS 7772 - 1975
ISO 3314 - 1975
DIN 222 - 1981
Dimensions in mm.



Diameter h8	Dia of Large end of Taper Bore	Overall Length
25	13	45
26	13	45
27	13	45
28	13	45
29	13	45
30	13	45
31	13	45
32	13	45
33	13	45
34	13	45
35	13	45
36	16	50
37	16	50
38	16	50
39	16	50
40	16	50
42	16	50
44	16	50
45	16	50

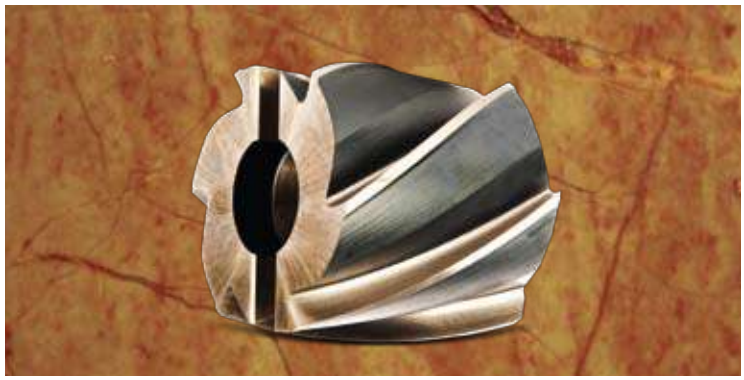
Diameter h8	Dia of Large end of Taper Bore	Overall Length
46	19	56
47	19	56
48	19	56
50	19	56
52	19	56
55	22	63
58	22	63
60	22	63
62	22	63
65	27	71
70	27	71
72	27	71
75	27	71
80	32	80
85	32	80
90	32	80
95	40	90
100	40	90

A Short Shell core drill with an axial taper hole generally 1 : 30 with cross slot for use on an arbor, the bevelled lead being provided with clearance for cutting purposes.

RH Helical flutes for RH Cutting shall be supplied unless otherwise specified

High Speed Steel
SHELL DRILLS

Specifications Conform to :
BS 122 : Part 2 : 1964
Dimensions in Inches



Diameter h8	Cutting Edge length	Overall Length	Diameter* of large end of Taper bore
1	2.1/4	2.3/4	0.625
1.1/16	2.1/4	2.3/4	0.625
1.1/8	2.1/4	2.3/4	0.625
1.3/16	2.1/4	2.3/4	0.625
1.1/4	2.1/4	2.3/4	0.625
1.5/16	2.3/8	3	0.750
1.3/8	2.3/8	3	0.750
1.7/16	2.3/8	3	0.750
1.1/2	2.3/8	3	0.750
1.9/16	2.3/8	3	0.750
1.5/8	2.3/8	3	0.750
1.11/16	2.3/4	3.1/2	1.000
1.3/4	2.3/4	3.1/2	1.000
1.13/16	2.3/4	3.1/2	1.000
1.7/8	2.3/4	3.1/2	1.000
1.15/16	2.3/4	3.1/2	1.000
2	2.3/4	3.1/2	1.000
2.1/16	3	3.3/4	1.250
2.1/8	3	3.3/4	1.250

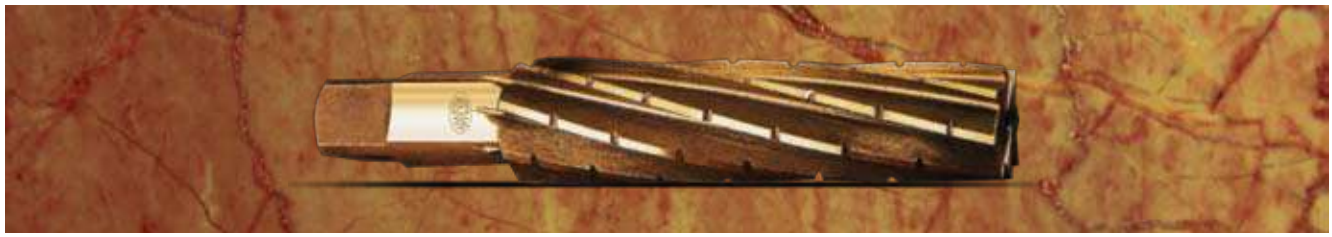
Diameter h8	Cutting Edge length	Overall Length	Diameter* of large end of Taper bore
2.3/16	3	3.3/4	1.250
2.1/4	3	3.3/4	1.250
2.5/16	3	3.3/4	1.250
2.3/8	3	3.3/4	1.250
2.7/16	3	3.3/4	1.250
2.1/2	3.1/4	4	1.500
2.5/8	3.1/4	4	1.500
2.3/4	3.1/4	4	1.500
2.7/8	3.1/4	4	1.500
3	3.1/4	4	1.500
3.1/8	3.3/4	4.1/2	1.750
3.1/4	3.3/4	4.1/2	1.750
3.3/8	3.3/4	4.1/2	1.750
3.1/2	3.3/4	4.1/2	1.750
3.5/8	4.1/4	5	2.000
3.3/4	4.1/4	5	2.000
3.7/8	4.1/4	5	2.000
4	4.1/4	5	2.000

* Taper of the bore is 1/8 inch per foot on diameter.

RH Helical flutes for RH Cutting shall be supplied unless otherwise specified.

High Speed Steel PARALLEL SHANK HAND SOCKET REAMERS

Specifications Conform to :
BS 328 : Part 4 : 1983
IS 5882 - 1970
Dimensions in mm



Designation	Cutting Edge length	Overall Length	Dia. of Shank
Morse No.0	61	93	8
Morse No.1	66	102	10
Morse No.2	79	121	14
Morse No.3	96	146	20

Designation	Cutting Edge length	Overall Length	Dia. of Shank
Morse No.4	119	179	25.0
Morse No.5	150	222	31.5
Morse No.6	208	300	45.0

Roughing Reamers shall be supplied with RH Helix and RH cutting with nicking.
Finishing Reamers shall be supplied with LH helix and RH cutting without nicking.

High Speed Steel TAPER SHANK MACHINE SOCKET REAMERS

Specifications Conform to:
BS 328 : Part 4 : 1983
IS 5907 - 1970
Dimensions in mm

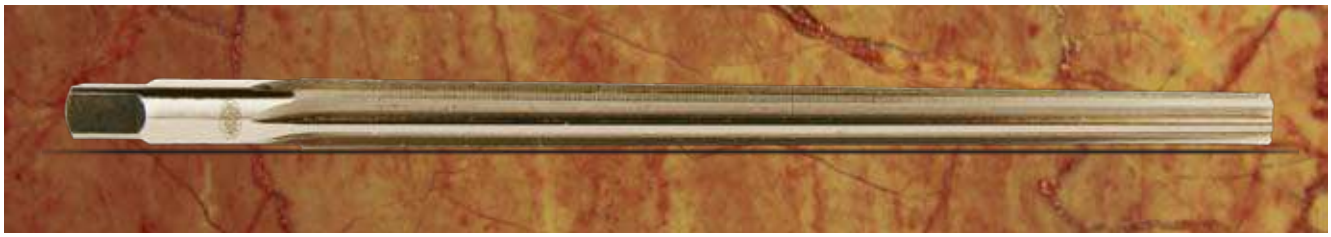
Designation	Cutting Edge Length	Overall Length	Morse Taper No.
Morse No.0	61	137	1
Morse No.1	66	142	1
Morse No.2	79	173	2
Morse No.3	96	212	3

Designation	Cutting Edge Length	Overall Length	Morse Taper No.
Morse No.4	119	263	4
Morse No.5	150	331	5
Morse No.6	208	389	5

Roughing Reamers shall be supplied with RH Helix and RH cutting with nicking.
Finishing Reamers shall be supplied with LH helix and RH cutting without nicking.

High Speed Steel
HAND TAPER PIN REAMERS

Specifications Conform to :
IS 5881 - 1984
ISO 3465 - 1975
DIN 9 - 1975
Dimensions in mm



Nom. Diameter	Cutting Edge Length	Overall Length
3	58	80
4	68	93
5	73	100
6	105	135
8	145	180
10	175	215
12	210	255

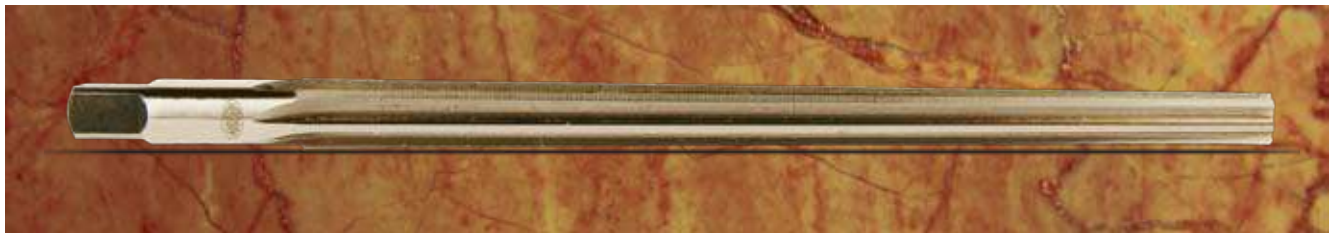
Nom. Diameter	Cutting Edge Length	Overall Length
16	230	280
20	250	310
25	300	370
30	320	400
40	340	430
50	360	460

A reamer having tapered cutting edges for holes to suit pins with a taper of 1:50 on diameter integral with a parallel shank with driving square at the end.

Reamers with straight flutes and RH cutting shall be supplied unless otherwise specified.

High Speed Steel
HAND TAPER PIN REAMERS

Specifications Conform to :
BS 328 : Part 4 : 1983
Dimensions in Inch.



Nom. Diameter	Cutting Edge Length	Overall Length	Large End Dia. and Dia. of Shank	Small End Dia.
1/8	1.3/4	2.3/4	0.127	0.0905
9/64	1.7/8	2.7/8	0.143	0.1039
5/32	2	3	0.158	0.1163
11/64	2.1/4	3.1/2	0.174	0.1271
3/16	2.3/4	4	0.195	0.1377
7/32	2.3/4	4	0.220	0.1627
1/4	3.3/8	4.5/8	0.253	0.1827
9/32	4.1/8	5.5/8	0.292	0.2061
5/16	4.1/8	5.5/8	0.316	0.2301
11/32	4.1/2	6	0.347	0.2533
3/8	5	6.1/2	0.381	0.2768
13/32	5.3/4	7.1/2	0.412	0.2922
7/16	5.3/4	7.1/2	0.443	0.3232
1/2	6.1/2	8.1/4	0.506	0.3706
9/16	6.3/4	8.1/2	0.571	0.4304
5/8	7.1/2	9.1/4	0.633	0.4768
3/4	8.3/4	10.3/4	0.760	0.5777
7/8	9.1/2	12	0.885	0.6871

Taper on diameter 1 in 48.

Straight flutes for RH cutting shall be supplied unless otherwise specified

High Speed Steel
MACHINE TAPER PIN REAMERS

Specifications Conform to:
IS 5918 - 1984
ISO 3467 - 1975
DIN 2180 - 1975
Dimensions in mm

Nom. Diameter	Cutting Edge length	Overall Length	Morse Taper No.
3	58	140	1
4	68	150	1
5	73	155	1
6	105	187	1
8	145	227	1
10	175	257	1
12	210	315	2

Nom. Diameter	Cutting Edge length	Overall Length	Morse Taper No.
16	230	335	2
20	250	377	3
25	300	427	3
30	320	475	4
40	340	495	4
50	360	550	5

Nom. Diameter 3 & 4 are not covered in IS, ISO & DIN standard

A reamer having tapered cutting edges for holes to suit pins with a taper of 1:50 on diameter integral with a Morse Taper Shank.

LH Helical flutes for RH Cutting shall be supplied unless otherwise specified

High Speed Steel
MACHINE TAPER PIN REAMERS

Specifications Conform to :
BS 328 : Part 4 : 1983
Dimensions in Inches

Nom. Diameter	Cutting Edge Length	Overall length	Large End Dia.	Small End Dia.	Morse Taper No.
3/16	3.1/8	6.1/16	0.199	0.1337	1
7/32	3.3/16	6.1/8	0.225	0.1581	1
1/4	3.7/8	6.13/16	0.258	0.1775	1
9/32	4.5/8	7.5/8	0.297	0.2009	1
5/16	4.5/8	7.5/8	0.321	0.2249	1
11/32	5.3/32	8.3/32	0.353	0.2471	1
3/8	5.13/16	8.7/8	0.389	0.2683	1
13/32	6.9/16	9.5/8	0.420	0.2837	1
7/16	6.11/16	9.3/4	0.453	0.3134	1
1/2	7.7/16	10.1/2	0.516	0.3608	1
9/16	7.3/4	11.1/2	0.581	0.4200	2
5/8	8.1/2	12.1/4	0.643	0.4664	2
3/4	9.3/4	13.1/2	0.770	0.5673	2
7/8	10.1/2	14.1/4	0.895	0.6767	2

Taper on diameter 1 : 48

Left Hand Helical flutes for Right Hand Cutting shall be supplied unless otherwise specified.

High Speed Steel
MACHINE BRIDGE REAMERS

Specifications Conform to:
IS 5919 - 1978
ISO 2238 - 1972
DIN 311 - 1975
BS 328 : Part 4 : 1983
Dimensions in mm / inch

Diameter k11		Cutting Edge Length	Overall Length	Morse Taper No.
mm	inch			
6.4	1/4	75	151	1
7.4	–	80	156	1
8.4	5/16	85	161	1
9.4	–	90	166	1
10.0	3/8	95	171	1
11.0	7/16	100	176	1
11.5	–	100	176	1
12.0	–	105	199	2
13.0	1/2	105	199	2
13.5	–	115	209	2
14.0	–	115	209	2
15.0	9/16	125	219	2
–	5/8	135	229	2
17.0	–	135	251	3
17.5	–	145	261	3
18.0	–	145	261	3
19.0	11/16	145	261	3
20.0	3/4	155	271	3
21.0	13/16	155	271	3
21.5	–	165	281	3
22.0	–	165	281	3
23.0	7/8	165	281	3
23.5	–	165	281	3
24.0	15/16	180	296	3
25.0	–	180	296	3
26.0	1	180	296	3
27.0	1.1/16	195	311	3
28.0	–	195	311	3
29.0	1.1/8	195	311	3
30.0	–	195	311	3
31.0	1.3/16	210	326	3
32.0	1.1/4	210	354	4
33.0	1.5/16	210	354	4
34.0	–	220	364	4
35.0	1.3/8	220	364	4
36.0	1.7/16	220	364	4
37.0	–	220	364	4
40.0	1.1/2	230	374	4
43.0	–	240	384	4
49.0	–	250	394	4

A reamer having parallel cutting edges with a long taper lead, integral with a Morse Taper Shank

LH Helical flutes for RH Cutting shall be supplied unless otherwise specified

High Speed Steel

CENTRE REAMERS

(Included Angle 60° or 90°)

Specifications Conform to :
BS 122 : Part 2 : 1964
Dimensions in Inches

Body Diameter	Overall Length	Length of Shank	Diameter of Shank
1/4	1.1/2	3/4	3/16
3/8	1.3/4	7/8	1/4
1/2	2	1	3/8
5/8	2.1/4	1	3/8
3/4	2.5/8	1.1/4	1/2

A cutter with teeth on the conical cutting face, integral with a parallel shank, designed for reaming a preformed centre or for producing a conical seating

High Speed Steel
COUNTERBORES WITH MORSE TAPER SHANKS AND DETACHABLE PILOTS

Specifications Conform to:
IS 5710 - 1988
ISO 4207 - 1977
DIN 375 - 1975
Dimensions in mm.

Diameter z9	Cutting Edge Length	Over all Length	Morse Taper No.	Pilot Diameter
13.5	22	132	2	5.0 to 11.2
14.5	22	132	2	5.0 to 12.5
16.5	25	140	2	6.3 to 14.0
17.5	25	140	2	6.3 to 14.0
19.5	25	140	2	6.3 to 16.0
20.0	25	140	2	6.3 to 18.0
22.0	30	150	2	8.0 to 18.0
23.0	30	150	2	8.0 to 20.0
25.0	30	150	2	8.0 to 22.4
26.0	35	180	3	10.0 to 22.4
28.0	35	180	3	10.0 to 22.4
29.0	35	180	3	10.0 to 25.0
31.0	35	180	3	10.0 to 25.0
33.0	40	190	3	12.5 to 28.0
34.0	40	190	3	12.5 to 28.0

Diameter z9	Cutting Edge Length	Over all Length	Morse Taper No.	Pilot Diameter
36	40	190	3	12.5 to 31.5
37	40	190	3	12.5 to 31.5
39	40	190	3	12.5 to 31.5
41	50	236	4	16.0 to 35.5
43	50	236	4	16.0 to 35.5
46	50	236	4	16.0 to 40.0
48	50	236	4	16.0 to 40.0
51	63	250	4	20.0 to 40.0
53	63	250	4	20.0 to 45.0
55	63	250	4	20.0 to 45.0
57	63	250	4	20.0 to 50.0
59	63	250	4	20.0 to 50.0
61	63	250	4	20.0 to 50.0
63	63	250	4	20.0 to 56.0

A cutter with teeth on the periphery and the end, integral with a Morse Taper Shank, and having a detachable pilot. The cutter is intended for producing a flat seating for the accomodation of the head of a bolt set screw etc. and is located by means of the pilot with relation to a centre hole.

High Speed Steel
COUNTER BORES

Specifications Conform to:
BS 122 : Part 2 : 1964
Dimensions in Inch

Diameter	Cutting Edge Length	Overall Length	Morse Taper No.	Pilot Dia.
1/4	3/8	3.3/4	1	1/8
5/16	7/16	4	1	3/16
3/8	1/2	4.1/4	1	7/32
7/16	5/8	4.1/2	1	1/4
1/2	3/4	4.3/4	1	5/16
9/16	13/16	5.3/8	2	3/8
5/8	7/8	5.5/8	2	7/16
11/16	15/16	5.7/8	2	7/16
3/4	1	5.15/16	2	1/2
13/16	1.1/16	6.3/16	2	9/16
7/8	1.1/8	6.7/16	2	5/8
15/16	1.1/4	7.7/16	3	5/8
1	1.3/8	7.1/2	3	3/4
1.1/8	1.1/2	7.3/4	3	3/4
1.1/4	1.5/8	8	3	3/4
1.3/8	1.3/4	9	4	13/16
1.1/2	1.7/8	9	4	7/8
1.5/8	2	9	4	15/16
1.3/4	2.1/8	9	4	1
1.7/8	2.1/4	9	4	1.1/8
2	2.1/2	9	4	1.1/4

Counterbores of size upto and including 1/2" dia are supplied with solid pilot.

Tolerance on dia. of counterbores:
Sizes from 1/4" upto & including 3/4" = + 0.010" /+0.005"
Over 3/4" upto & including 2" = +0.015"/+0.010"

High Speed Steel
COUNTER BORES WITH PARALLEL SHANKS AND SOLID PILOTS

Specifications Conform to:
IS 5704 - 1988
ISO 4206 - 1977
DIN 373 - 1975
Dimensions in mm

Diameter z9	Dia.of Shank h9	Cutting Edge Length	Overall Length
6	5	14	71
7	5	14	71
8	5	14	71
9	8	18	80
10	8	18	80
11	8	18	80
12	8	18	80
12.5	8	18	80

Diameter z9	Dia.of Shank h9	Cutting Edge Length	Overall Length
13	12.5	22	100
14	12.5	22	100
15	12.5	22	100
16	12.5	22	100
17	12.5	22	100
18	12.5	22	100
19	12.5	22	100
20	12.5	22	100

Pilot Diameter: To be specified to suit pilot hole diameter when ordering. (minimum possible pilot diameter is equal to 1/3rd of counter bore diameter.) Tolerance on pilot diameter is e8

A cutter with teeth on the periphery and end, integral with a parallel shank, and having a pilot. The cutter is intended for producing a flat seating for the accommadation of the head of a bolt set screw etc. and is located by means of the pilot with relation to a centre hole.

High Speed Steel

COUNTER SINKS 90° WITH PARALLEL SHANKS AND SOLID PILOTS

Specifications Conform to :
IS 5693 - 1988
ISO 4205 - 1977
DIN 1866 - 1975
Dimensions in mm

Diameter z9	Dia.of Shank h9	Cutting Edge Length	Over all Length
10.0	8.0	18	80
11.0	8.0	18	80
12.0	8.0	18	80
12.5	8.0	18	80
13.0	12.5	22	100
14.0	12.5	22	100
15	12.5	22	100
16	12.5	22	100
17	12.5	22	100
18	12.5	22	100
19	12.5	22	100
20	12.5	22	100

Pilot Diameter: To be specified to suit pilot hole diameter when ordering. (minimum possible pilot diameter is equal to 1/3rd of counter sink diameter) Tolerance on pilot diameter is e8

A cutter with teeth on conical cutting faces, integral with a parallel shank,designed to produce a conical seating to accommodate the conical head of a component such as screw or rivet.

High Speed Steel

COUNTER SINKS 60°, 90° AND 120° WITH PARALLEL SHANK

Specifications Conform to :
IS 13304 - 1992
ISO 3294 - 1975
BS 328 : Part 5 : 1983
Dimensions in mm

Nominal Size	Small Dia.	Overall Length		Body Length		Shank Dia. h9
		$\alpha = 60°$	$\alpha = 90° \& 120°$	$\alpha = 60°$	$\alpha = 90° \& 120°$	
8.0	1.6	48	44	-	-	8
10.0	2.0	50	46	18	14	8
12.5	2.5	52	48	20	16	8
16.0	3.2	60	56	24	20	10
20.0	4.0	64	60	28	24	10
25.0	7.0	69	65	33	29	10

A cutter with teeth on the conical cutting faces, integral with a parallel shank designed to produce a conical seating to accommodate the conical head of a component such as screw or rivet.

R.H. cutting with straight teeth shall be supplied unless otherwise specified.

High Speed Steel
COUNTER SINKS 60°, 90° AND 120° WITH MORSE TAPER SHANK

Specifications Conform to :
IS 13303 - 1992
ISO 3293 - 1975
BS 328 : Part 5 : 1983
Dimensions in mm

Nominal size	Small Dia.	Overall Length		Body Length		Morse Taper No.
		α=60°	α= 90°&120°	α= 60°	α = 90° & 120°	
16.0	3.2	97	93	24	20	1
20.0	4.0	120	116	28	24	2
25.0	7.0	125	121	33	29	2
31.5	9.0	132	124	40	32	2
40.0	12.5	160	150	45	35	3
50.0	16.0	165	153	50	38	3
63.0	20.0	200	185	58	43	4
80.0	25.0	215	196	73	54	4

A cutter with teeth on conical cutting faces, integral with a Morse Taper Shank designed to produce a conical seating to accommodate the conical head of a component such as screw or rivet.

R.H. cutting with straight teeth shall be supplied unless otherwise specified.

High Speed Steel
COUNTER SINKS WITH TAPER SHANKS
Included Angle 60° or 90°

Specifications Conform to :
BSS 122 : Part 2 : 1964
Dimensions in Inches

Body Diameter	Overall length	Small Diameter	Morse Taper No.
1/2	3.1/2	5/32	1
5/8	3.5/8	3/16	1
3/4	4.1/4	1/4	2
7/8	4.1/4	9/32	2
1	4.3/8	5/16	2
1.1/8	4.1/2	3/8	2
1.1/4	5.3/8	13/32	3
1.3/8	5.3/8	7/16	3
1.1/2	5.1/2	1/2	3
1.3/4	6.3/4	9/16	4
2	7	21/32	4
2.1/4	7.1/4	3/4	4
2.1/2	7.3/4	13/16	4
2.3/4	8	7/8	4
3	8.1/4	1	4

Tolerance on Body dia:
Sizes upto and incl. 1" = - 0.001" / - 0.003"
Over 1" = - 0.002" / - 0.005"
RH Cutting with straight flutes shall be supplied unless otherwise specified.

High Speed Steel
COUNTER SINKS 60°

Specifications Conform to :
DIN 334 - 1979
Dimensions in mm

Form 'A' - Straight Shank

Nominal Size	Shank dia.	Small end dia.	Overall Length	Body Length
8.0	-	-	50	-
12.5	8	2.0	50	18
16.0	10	3.2	60	24
20.0	10	5.0	63	27

Form 'B' - Morse Taper Shank

Nominal Size	Small end dia.	Overall Length	Body Length	Morse TaperNo.
16.0	3.2	100	24	1
25.0	7.0	125	33	2
31.5	9.0	132	40	2
40.0	12.0	160	45	3
50.0	16.0	170	50	3
63.0	20.0	200	58	4
80.0	25.0	215	73	4

R.H. Cutting with straight teeth shall be supplied unless otherwise specified.

High Speed Steel
COUNTER SINKS 60°

Specifications Conform to :
DIN 334 - 1979
Dimensions in mm.

Form 'C' - Straight Shank with 3 cutting edges

Nominal Size	Shank dia.	Small end dia.	Overall Length	Body Length
6.3	5	1.6	45	6.3
8.0	6	2.0	50	8.0
12.5	8	3.2	56	11.2
16.0	10	4.0	63	14.0
20.0	10	5.0	67	17.0
25.0	10	6.3	71	20.0

Form 'D' - Morse Taper Shank 3 cutting edges

Nominal Size	Small end dia	Overall Length	Body Length	Morse Taper No.
16.0	4.0	90	14.0	1
20.0	5.0	106	17.0	2
25.0	6.3	112	20.0	2
31.5	10.0	118	22.4	2
40.0	12.5	150	28.0	3
50.0	16.0	160	35.5	3
63.0	20.0	190	42.5	4
80.0	25.0	200	53.0	4

R.H. cutting with straight teeth shall be supplied unless otherwise specified.

High Speed Steel
COUNTER SINKS 90°

Specifications Conform to :
DIN 335 - 1979
Dimensions in mm

Form 'A' - Straight Shank

Nominal Size	Shank dia	Small end dia	Overall Length	Body Length
8.0	-	-	48	-
12.5	8	2	48	16
16.0	10	3.2	56	20
20.0	10	5	60	24

Form 'B' - Morse Taper Shank

Nominal Size	Small end dia	Overall Length	Body Length	Morse Taper No.
16.0	3.2	95	20	1
25.0	7.0	118	26	2
31.5	9.0	122	30	2
40.0	12.0	150	35	3
50.0	16.0	155	38	3
63.0	20.0	185	43	4
80.0	25.0	196	54	4

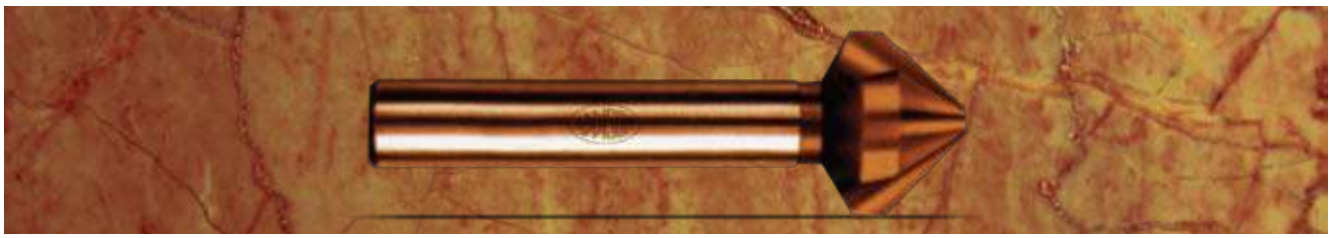
R.H. cutting with straight teeth shall be supplied unless otherwise specified.

ADDISON

High Speed Steel
COUNTER SINKS 90°

Specifications Conform to :
DIN 335 - 1979
Dimensions in mm.

Form 'C' - Straight Shank with 3 cutting edges



Nominal Size	Shank Dia.	Small End Dia.	Overall Length	Body Length
4.3	4	1.3	40	3.5
5.0	4	1.5	40	4.0
5.3	4	1.5	40	4.0
5.8	5	1.5	45	4.5
6.0	5	1.5	45	4.5
6.3	5	1.5	45	5.0
7.0	6	1.8	50	5.0
7.3	6	1.8	50	5.6
8.0	6	2.0	50	5.6
8.3	6	2.0	50	6.0
9.4	6	2.2	50	6.7
10.0	6	2.5	50	7.1
10.4	6	2.5	50	7.1

Nominal Size	Shank Dia.	Small End Dia.	Overall Length	Body Length
11.5	8	2.8	56	7.5
12.4	8	2.8	56	8.0
13.4	8	2.9	56	8.5
15.0	10	3.2	60	9.0
16.5	10	3.2	60	10.0
19.0	10	3.5	63	11.2
20.5	10	3.5	63	12.5
23.0	10	3.8	67	13.2
25.0	10	3.8	67	15.0
26.0	10	3.8	67	15.0
28.0	12	4.0	71	16.0
30.0	12	4.2	71	18.0
31.0	12	4.2	71	18.0

R.H. Cutting with straight teeth shall be supplied unless otherwise specified

Form 'D' - Morse Taper Shank with 3 cutting edges

Nominal Size	Small End dia.	Overall Length	Body Length	Morse Taper No.
15.0	3.2	85	9.0	1
16.5	3.2	85	10.0	1
19.0	3.5	100	11.2	2
20.5	3.5	100	12.5	2
23.0	3.8	106	13.2	2
25.0	3.8	106	15.0	2
26.0	3.8	106	15.0	2
28.0	4.0	112	16.0	2

Nominal Size	Small End dia.	Overall Length	Body Length	Morse Taper No.
30	4.2	112	18.0	2
31	4.2	112	18.0	2
34	4.5	118	19.0	2
37	4.8	118	21.2	2
40	10.0	140	20.0	3
50	14.0	150	23.6	3
63	16.0	180	28.0	4
80	22.0	190	35.5	4

R.H. Cutting with straight teeth shall be supplied unless otherwise specified

TECHNICAL INFORMATION

High Speed Steel
STOCK REMOVAL BY REAMING

Size of the reamed hole in mm		Stock removal in mm.	
Over	Upto & incl.	When Pre - drilled	When Pre - core drilled
	10	0.3	0.2
10	14	0.4	0.25
14	18	0.5	0.25
18	30	0.5	0.3
30	50	1	0.4

R.H. Cutting with straight teeth shall be supplied unless otherwise specified

Insufficient stock for reaming may result in a burnishing rather than a cutting action. The Table above shows the amount of stock to be removed by a Reamer. The first column shows stock removal when a two fluted drill has been used. The second column shows when a core drill has been used as a prefinishing tool.

FEEDS IN REAMING

Diameter of Reamer in mm	Feed mm / Rev
Upto 4	0.06 - 0.2
Over 4 upto 6	0.10 - 0.3
Over 6 upto 10	0.12 - 0.4
Over 10 upto 16	0.16 - 0.6
Over 16 upto 20	0.20 - 0.8
Over 20 upto 25	0.24 - 1.0
Over 25 upto 40	0.30 - 1.2
Over 40 upto 63	0.40 - 1.4

For Reaming, use feeds higher than those used for drilling. The amount of feed may vary between the materials. If the feed is too low, may result in glazing, excessive wear and sometimes chatter. If the feed is too high, it may reduce the accuracy of the hole and finish.

SPEEDS IN REAMING

Material to be reamed	Speed 'Vc'	
	Ft. per min	Meters per min
Aluminium and Aluminium Alloys	135 - 200	41 - 60
Bakelite, Vulcanite, etc.	65 - 100	20 - 30
Brass	100 - 160	30 - 48
Brass - leaded	135 - 200	41 - 60
Bronze : ordinary	65 - 135	20 - 41
high tensile	45 - 65	14 - 20
Cast Iron: Soft	65 - 100	20 - 30
Medium	50 - 60	15 - 18
Hard	35 - 45	11 - 19
Chilled	15 - 25	5 - 8
Copper	65 - 135	20 - 41
Duralumin	65 - 135	20 - 41
Magnesium and Magnesium Alloys	160 - 265	48 - 80
Malleable Iron	45 - 50	14 - 15
Monel Metal	25 - 35	8 - 11
Zinc base die-casting material (Mazak)	135 - 200	41 - 60
Slate, Stone, Marble	10 - 15	3 - 5
Steel: free-cutting	65 - 100	20 - 30
upto 40 tons tensile	50 - 75	5 - 22
40-60 tons tensile	30 - 45	9 - 14
60-80 tons tensile	20 - 30	6 - 9
over 80 tons tensile	10 - 15	3 - 5
Manganese	10 - 15	3 - 5
Stainless Steel-Martensitic, Ferritic and Austenitic	20 - 50	6 - 15
Stainless Steel - free cutting	30 - 80	9 - 24
Wood	200 - 265	60 - 80

The correct cutting speed for machine reaming depends upon the material being reamed, the rigidity of the machine and the tolerance or finish required. The correct speed for reaming is around two thirds of speed used for drilling the same material. Use slower speeds for less rigid machines. If close tolerances and fine finish are required, use slower speeds

TOLERANCE FOR SPECIAL REAMERS
Ref : IS 5443 - 1994.

C - 1 GENERAL

Unless otherwise specified, the diameter of cutting portion of the reamer shall have a tolerance of m6. In this section necessary information is given for determining the tolerance for the diameter of the cutting portion of the reamers where a grade of accuracy other than m6 is required. It is impossible to infer in advance the tolerance of a hole produced by a particular reamer because the actual diameter produced by the reamer depends upon a number of factors. Some of the factors which influence the accuracy of the hole diameter are as follows:

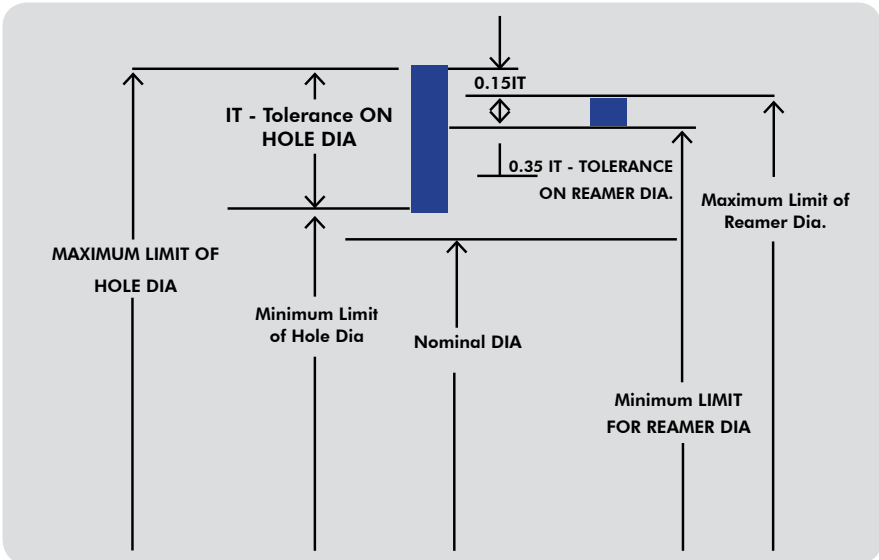
a) Type and amount of the material to be removed,
b) Cutting edge design of the reamer,
c) Method of mounting and operation,
d) Condition of the reamer at the time of use and
e) Lubrication

These factors shall be taken into account while determining the special tolerance to be given on a reamer in order to get a hole of given tolerance.

C - 2 METHOD OF DETERMINING THE SPECIAL TOLERANCE

C - 2.1 The maximum limit for the reamer diameter = the maximum limit of the hole - 0.15 IT. The value of 0.15 IT is to be rounded to next higher value of 0.001 mm.

C - 2.2 The minimum limit of the reamer diameter = the maximum limit of the reamer - 0.35 IT The value of 0.35 IT is to be rounded to next higher value of 0.001 mm



Example :

For a 12H7 hole.

IT = 0.018 Hole size maximum limit = 12.018
Minimum Limit = 12.000

Maximum limit of reamer diameter = Maximum limit of the hole - 0.15IT
= 12.018 - 0.15 x 0.018 = 12.018 - 0.0027
= 12.018 - 0.003 = 12.015

Minimum limit of reamer diameter = Maximum limit of the reamer diameter - 0.35 IT.
= 12.015 - 0.35 x 0.018 = 12.015 - 0.0063
= 12.015 - 0.007 = 12.008.