MIRANDA TOOLS®

Premium quality cutting tools

ASHOK PIRAMAL GROUP

MIRANDA MaxX®

PREMIUM MIRANDA QUALITY

www.mirandatools.in

Miranda Solid Carbide Drills

MIRANDA MaxX®

PRODUCT	Dia	Sh. Dia	FL	OAL
Solid Carbide Jobber Drill -TiAlN Coated	1.0	1.0	12	34
	1.5	1.5	18	40
	2.0	2.0	24	49
	2.5	2.5	30	57
	3.0	3.0	33	61
	3.5	3.5	39	70
	4.0	4.0	43	75
	4.5	4.5	47	80
	5.0	5.0	52	86
	5.5	5.5	57	93
	6.0	6.0	57	93
	6.5	6.5	63	101
	7.0	7.0	69	109
	7.5	7.5	69	109
	8.0	8.0	75	117
	8.5	8.5	75	117
	9.0	9.0	81	125
	9.5	9.5	81	125
	10.0	10.0	87	133
	10.5	10.5	87	133
	11.0	11.0	94	142
	12.0	12.0	101	151
	13.0	13.0	101	151
	14.0	14.0	108	160
	16.0	16.0	120	178

DIN 338 | MG HM | 30° | TiAlN | Cast Iron | 140° | Carbon Steels ~HB225 | Stainless Steels | Prehardened Steels HRC30-45 | Alloy Steels HB225~325

	Dia	Sh. Dia	FL	OAL
High Performance Solid Carbide Drill -TiAlN	3.0	6.0	28	66
	3.5	6.0	28	66
	4.0	6.0	36	74
	4.5	6.0	36	74
	5.0	6.0	44	82
	5.5	6.0	44	82
	6.0	6.0	44	82
	6.5	8.0	53	91
	7.0	8.0	53	91
	7.5	8.0	53	91
	8.0	8.0	53	91
	8.5	10.0	61	103
	9.0	10.0	61	103
	9.5	10.0	61	103
	10.0	10.0	61	103
	12.0	12.0	71	118
	14.0	14.0	77	124
	16.0	16.0	83	133
	18.0	18.0	93	143
	20.0	20.0	101	153

MG HM | TiAlN | h6 | 140° | Cast Iron | Stainless Steels | Prehardened Steels HRC30-45 | hardened Steels 45-55 hrc

- DRILLS FOR 60HRC ON REQUEST
- SPECIFIC SIZES ON REQUEST

MIRANDA Solid Carbide End Mills

MIRANDA MaxX®

MIRANDA MaxX®

PRODUCT	Dia	SH.DIA	FL	OAL
SOLID CARBIDE END MILL 2/4 FLUTE -TiAIN	1.0	3.0	3	38
	1.5	3.0	6	38
	2.0	3.0	9	38
	2.5	3.0	9	38
	3.0	3.0	12	38
	3.5	4.0	14	50
	4.0	4.0	14	50
	4.5	5.0	16	50
	5.0	5.0	20	50
	5.5	6.0	20	60
	6.0	6.0	20	60
	8.0	8.0	20	60
	10.0	10.0	25	75
	12.0	12.0	25	75
	14.0	14.0	25	75
	16.0	16.0	32	89
	20.0	20.0	38	102

MaxX General purpose
MG HM Stainless Steels
FLUTE 2/4 Alloy Steel
TiAIN Prehardened Steels HRc30-45

SOLID CARBIDE BALL NOSE END MILL 2/4 FLUTE -TiAIN	Dia	SH.DIA	FL	OAL
	1.0	3.0	3	38
	1.5	3.0	5	38
	2.0	3.0	7	38
	2.5	3.0	7	38
	3.0	3.0	9	38
	4.0	4.0	14	50
	5.0	5.0	16	50
	6.0	6.0	20	60
	8.0	8.0	20	64
	10.0	10.0	25	75
	12.0	12.0	25	76
	16.0	16.0	32	89
	20.0	20.0	38	102

MaxX General purpose
MG HM Stainless Steels
FLUTE 2/4 Alloy Steel
TiAIN Prehardened Steels HRc30-45

SOLID CARBIDE 4 F LONG END MILL -TiAIN	Dia	SH.DIA	FL	OAL
	3.0	3.0	20	60
	4.0	4.0	20	75
	5.0	5.0	25	75
	6.0	6.0	30	75
	8.0	8.0	40	100
	10.0	10.0	40	100
	10.0	10.0	75	150
	12.0	12.0	50	100
	12.0	12.0	75	150
	16.0	16.0	75	150
	20.0	20.0	75	150

MaxX General purpose
MG HM Stainless Steels
FLUTE 2/4 Alloy Steel
TiAIN Prehardened Steels HRc30-45

SUGGESTED SPEED AND FEED DATA FOR SOLID CARBIDE ENDMILLS

Application : Slotting / Key way machining

Material HRc Diameter	Carbon steel , Alloy Steel < HRc 28		Carbon steel , Alloy Steel HRc 28 - HRc 45		Stainless Steel and Super alloys		Cast Iron	
	RPM	feed/tooth	RPM	feed/tooth	RPM	feed/tooth	RPM	feed/tooth
2	6369	0.03	6369	0.024	6369	0.02	6369	0.044
3	4777	0.045	4777	0.036	4777	0.03	4777	0.066
4	3981	0.06	3981	0.048	3981	0.04	3981	0.088
5	3185	0.075	3185	0.06	3185	0.05	3185	0.11
6	2654	0.09	2654	0.072	2654	0.06	2654	0.132
8	1990	0.12	1990	0.096	1990	0.08	1990	0.176
10	1911	0.15	1911	0.12	1911	0.1	1911	0.22
12	1592	0.18	1592	0.144	1592	0.12	1592	0.264
14	1365	0.21	1365	0.168	1365	0.14	1365	0.308
16	1393	0.24	1393	0.192	1393	0.16	1393	0.352
18	1238	0.27	1238	0.216	1238	0.18	1238	0.396
20	1115	0.3	1115	0.24	1115	0.2	1115	0.44

- Reduce feed rate by around 30% in case of long types
- Increase speed and feed rate by around 25% in case of coated endmills

Application : End milling

Material HRc Diameter	Carbon steel , Alloy Steel < HRc 28		Carbon steel , Alloy Steel HRc 28 - HRc 45		Stainless Steel and Super alloys		Grey Cast Iron	
	RPM	feed/tooth	RPM	feed/tooth	RPM	feed/tooth	RPM	feed/tooth
2	6369	0.04	6369	0.03	6369	0.024	6369	0.06
3	4777	0.06	4777	0.045	4777	0.036	4777	0.09
4	3981	0.08	3981	0.06	3981	0.048	3981	0.12
5	3185	0.1	3185	0.075	3185	0.06	3185	0.15
6	2654	0.12	2654	0.09	2654	0.072	2654	0.18
8	1990	0.16	1990	0.12	1990	0.096	1990	0.24
10	1911	0.2	1911	0.15	1911	0.12	1911	0.3
12	1592	0.24	1592	0.18	1592	0.144	1592	0.36
14	1365	0.28	1365	0.21	1365	0.168	1365	0.42
16	1393	0.32	1393	0.24	1393	0.192	1393	0.48
18	1238	0.36	1238	0.27	1238	0.216	1238	0.54
20	1115	0.4	1115	0.3	1115	0.24	1115	0.6

SUGGESTED SPEED AND FEED DATA FOR SOLID CARBIDE DRILLS

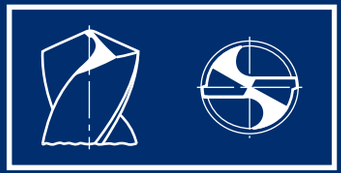
Application : Drilling

Material HRc Diameter	Carbon steel , Alloy Steel < HRc 28		Carbon steel , Alloy Steel HRc 28 - HRc 45		Stainless Steel and Super alloys		Cast Iron	
	RPM	mm/rev	RPM	mm/rev	RPM	mm/rev	RPM	mm/rev
2	5100	0.04	5100	0.03	4900	0.02	5100	0.06
3	4246	0.045	4246	0.036	4246	0.03	4246	0.066
4	3583	0.06	3583	0.048	3583	0.04	3583	0.088
5	2866	0.075	2866	0.06	2866	0.05	2866	0.11
6	2389	0.09	2389	0.072	2389	0.06	2389	0.132
8	1990	0.12	1990	0.096	1990	0.08	1990	0.176
10	1592	0.15	1592	0.12	1592	0.10	1592	0.22
12	1327	0.18	1327	0.144	1327	0.12	1327	0.264
14	1251	0.21	1251	0.168	1251	0.14	1251	0.308
16	1194	0.24	1194	0.192	1194	0.16	1194	0.352
18	1062	0.27	1062	0.216	1062	0.18	1062	0.396
20	1115	0.3	1115	0.24	1115	0.2	1115	0.44

- Increase speed and feed rate by around 25% in case of coated endmills
- Reduce feed rate by around 30% in case of long types
- Increase speed and feed rate by around 25% in case of coated Drills

Technical Formulaes

Cutting speed.	=	π X Dia of Tool X RPM) / 1000
Feed in mm per revolution.	=	feed in mm per tooth X no. of flutes
Feed in mm per min.	=	RPM X feed in mm per revolution.
Cutting time.	=	Cutting length / feed in mm per min



Split Point Geometry

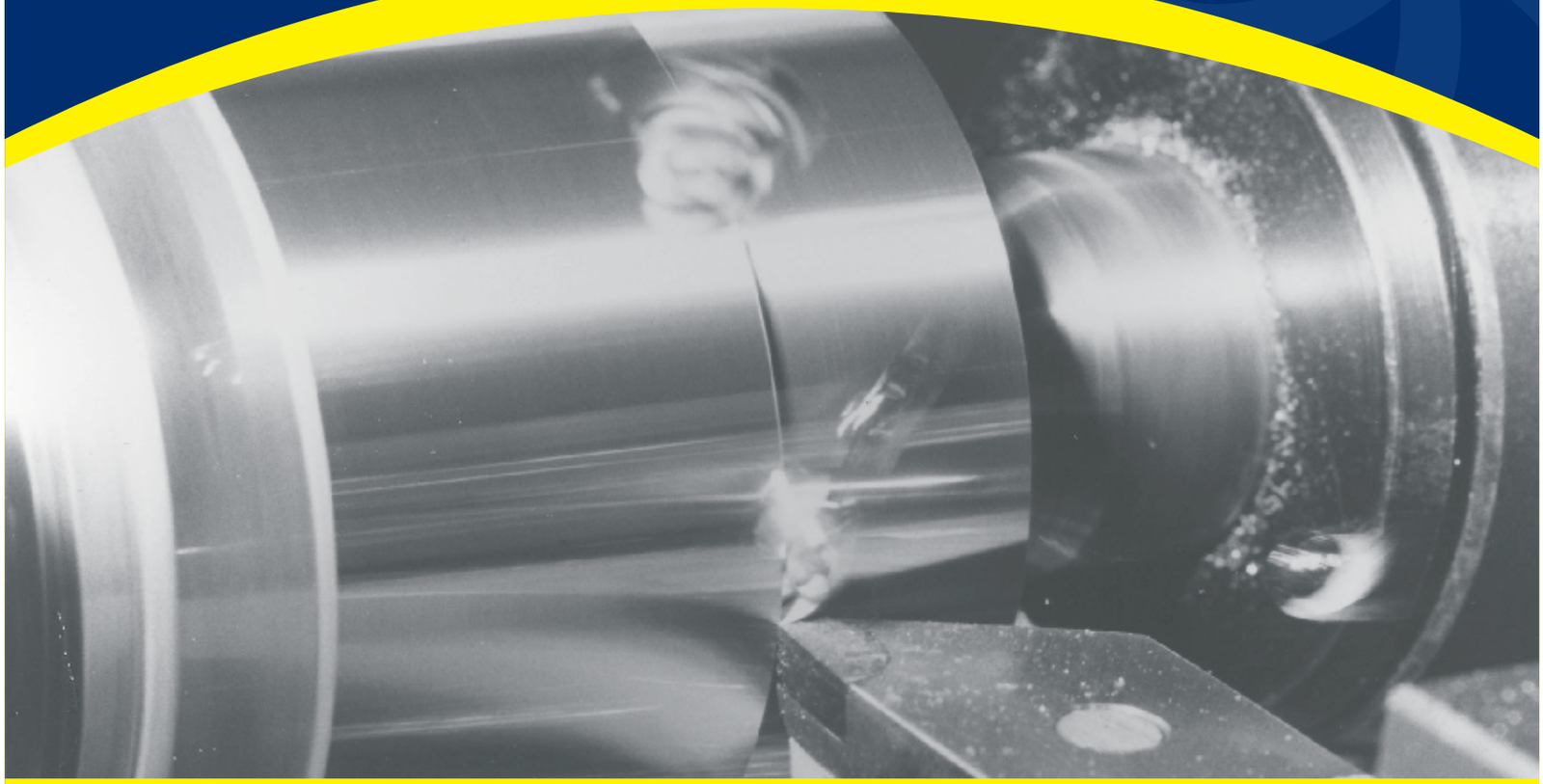
MIRANDA TOOLS®

Premium Quality Cutting Tools

ASHOK PIRAMAL GROUP

Tungsten Carbide Tipped Tools

CTT

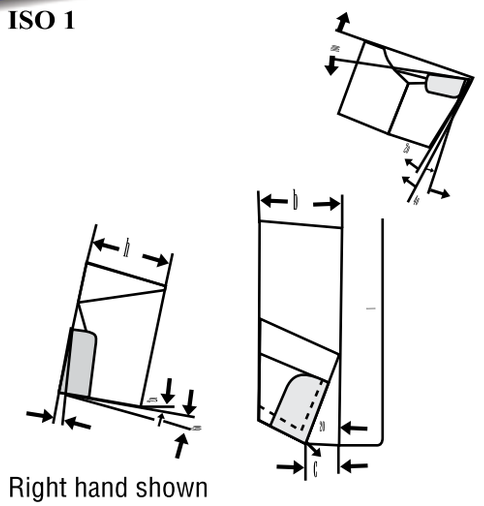


PREMIUM MIRANDA QUALITY

MIRANDA TOOLS®

110 Bar Turning Tool

ISO 1

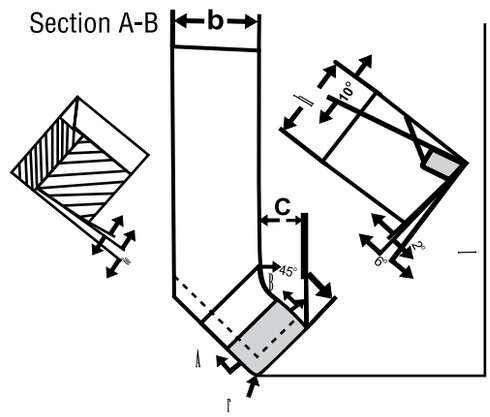


Right hand shown

Shank Section	Tool No.	h mm	b mm	c mm	i mm	Tip RH	Tip LH
	110-1010	10	10	4	90	A 8	B 8
	110-1212	12	12	5	100	A 10	B 10
	110-1616	16	16	6	110	A 12	B 12
	110-2020	20	20	8	125	A 16	B 16
	110-2525	25	25	10	140	A 20	B 20
	110-3232	32	32	12	170	A 25	B 25
	110-4040	40	40	16	200	A 32	B 32
	110-1610	16	10	4	110	A 10	B 10
	110-2012	20	12	5	125	A 12	B 12
	110-2516	25	16	6	140	A 16	B 16
	110-3220	32	20	8	170	A 20	B 20
	110-4025	40	25	10	200	A 25	B 25

111 CRANKED TURNING AND FACING TOOL

ISO 2

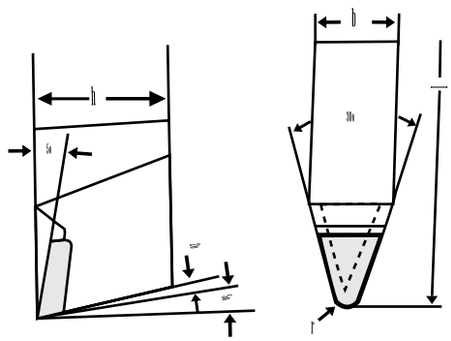


Right hand shown

Shank Section	Tool No.	h mm	b mm	l mm	C mm	Tip
	111-1010	10	10	90	6	C 8
	111-1212	12	12	100	7	C 10
	111-1616	16	16	110	8	C 12
	111-2020	20	20	125	10	C 16
	111-2525	25	25	140	12	C 20
	111-3232	32	32	170	14	C 25
	111-4040	40	40	200	18	C 32
	111-1610	16	10	110	7	C 10
	111-2012	20	12	125	8	C 12
	111-2516	25	16	140	10	C 16
	111-3220	32	20	170	12	C 20
	111-4025	40	25	200	14	C 25

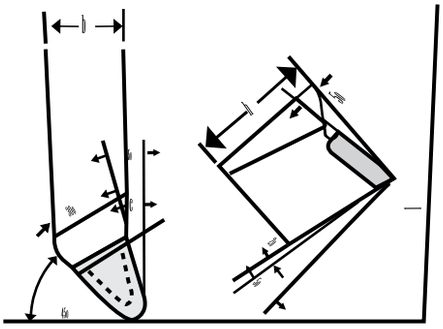
113 Straight Round Nose Turning Tool

ISO 3



Shank Section	Tool No.	h mm	b mm	l mm	r mm	Tip
	113-1010	10	10	90	1.0	G 8
	113-1212	12	12	100	1.5	G 10
	113-1616	16	16	110	2.5	G 12
	113-2020	20	20	125	3.5	G 16
	113-2525	25	25	140	4.5	G 20
	113-3232	32	32	170	6.0	G 25
	110-1610	16	10	110	1.0	G 8
	110-2012	20	12	125	1.5	G 10
	110-2516	25	16	140	2.5	G 12
	110-3220	32	20	170	3.5	G 16
	110-4025	40	25	200	4.5	G 20

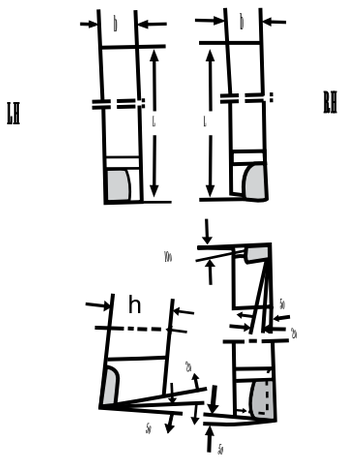
115 Cranked Round Nose Turning Tool



Right hand shown

Shank Section	Tool No.	h mm	b mm	l mm	c mm	r mm	Tip
	115-1010	10	10	90	3.0	1.0	G 8
	115-1212	12	12	100	3.5	1.5	G 10
	115-1616	16	16	110	4.5	2.5	G 12
	115-2020	20	20	125	5.0	3.5	G 16
	115-2525	25	25	140	5.5	4.5	G 20
	115-3232	32	32	170	6.5	6.0	G 25
	115-1610	16	10	110	3.0	A 10	G 8
	115-2012	20	12	125	3.5	A 12	G 10
	115-2516	25	16	140	4.5	A 16	G 12
	115-3220	32	20	170	5.0	A 20	G 16
	115-4025	40	25	200	5.5	A 25	G 20

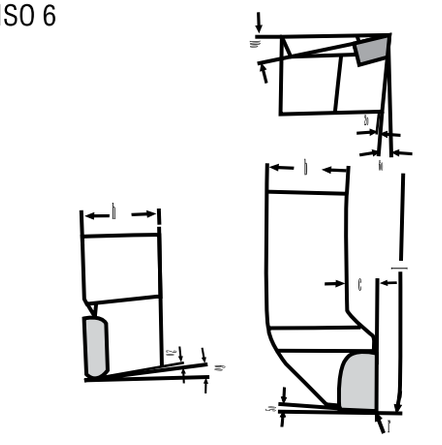
116 BAR TURNING TOOL



Shank Section	Tool No.	h mm	b mm	l mm	Tip RH	Tip LH
	116-1010	10	10	90	A 8	B 8
	116-1212	12	12	100	A 10	B 10
	116-1616	16	16	110	A 12	B 12
	116-2020	20	20	125	A 16	B 16
	116-2525	25	25	140	A 20	B 20
	116-3232	32	32	170	A 25	B 25
	110-1610	16	10	110	A 10	B 10
	110-2012	20	12	125	A 12	B 12
	110-2516	25	16	140	A 16	B 16
	110-3220	32	20	170	A 20	B 20
	110-4025	40	25	200	A 25	B 25

117 CRANKED KNIFE TOOL

ISO 6

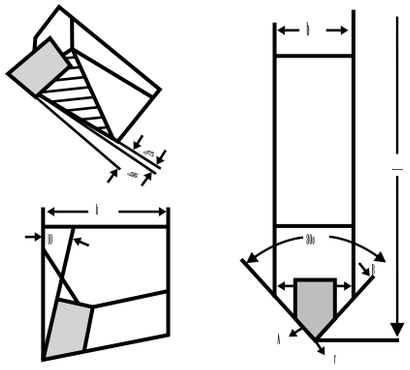


Right hand shown

Shank Section	Tool No.	h mm	b mm	l mm	C mm	Tip RH	Tip LH
	117-1010	10	10	90	4	A 8	B 8
	117-1212	12	12	100	5	A 10	B 10
	117-1616	16	16	110	6	A 12	B 12
	117-2020	20	20	125	8	A 16	B 16
	117-2525	25	25	140	10	A 20	B 20
	117-3232	32	32	170	12	A 25	B 25
	117-4040	40	40	200	14	A 32	B 32
	110-1610	16	10	110	5	A 10	B 10
	110-2012	20	12	125	6	A 12	B 12
	110-2516	25	16	140	8	A 16	B 16
	110-3220	32	20	170	10	A 20	B 20
	110-4025	40	25	200	12	A 25	B 25

122 STRAIGHT FINISHING Tool

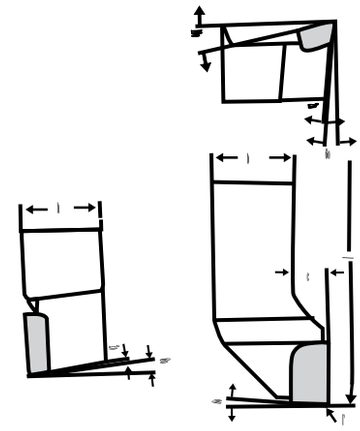
IND 1 Section A-B



Shank Section	Tool No.	h mm	b mm	l mm	Tip
	IND-1-1010	10	10	90	E 5
	IND-1-1212	12	12	100	E 6
	IND-1-1616	16	16	110	E 8
	IND-1-2020	20	20	125	E 10
	IND-1-2525	25	25	140	E 12
	IND-1-3232	32	32	170	E 16
	IND-1-1610	16	10	110	E 5
	IND-1-2012	20	12	125	E 6
	IND-1-2516	25	16	140	E 8
	IND-1-3220	32	20	170	E 10
	IND-1-4025	40	25	200	E 12

123 CRANKED FINSHING TOOL

ISO 3

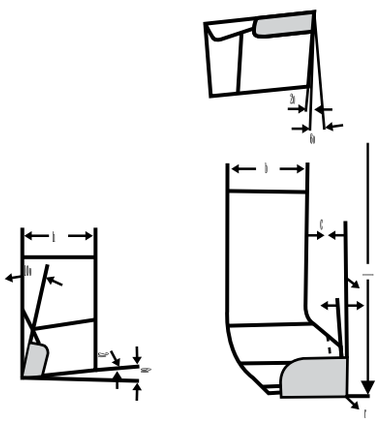


Right hand shown

Shank Section	Tool No.	h mm	b mm	c mm	l mm	Tip RH	Tip LH
	123-1010	10	10	4	90	A 08	B 08
	123-1212	12	12	6	100	A 10	B 10
	123-1616	16	16	8	110	A 12	B 12
	123-2020	20	20	10	125	A 16	B 16
	123-2525	25	25	12	140	A 20	B 20
	123-3232	32	32	14	170	A 25	B 25
	123-1610	16	10	5	110	A 10	B 10
	123-2012	20	12	6	125	A 12	B 12
	123-2516	25	16	8	140	A 16	B 16
	123-3220	32	20	10	170	A 20	B 20
	123-4025	40	25	12	200	A 25	B 25

126 CRANKED FACING TOOL

ISO 5

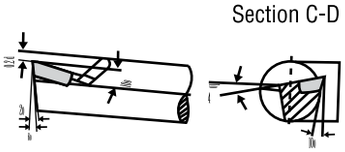


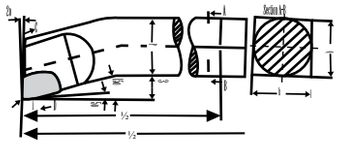
Right hand shown

Shank Section	Tool No.	h mm	b mm	l mm	C mm	Tip RH	Tip LH
	126-1010	10	10	90	5	B 8	A 8
	126-1212	12	12	100	6	B 10	A 10
	126-1616	16	16	110	8	B 12	A 12
	126-2020	20	20	125	10	B 16	A 16
	126-2525	25	25	140	12	B 20	A 20
	126-3232	32	32	170	16	B 25	A 25
	126-1610	16	10	110	6	B 10	A 10
	126-2012	20	12	125	8	B 12	A 12
	126-2516	25	16	140	10	B 16	A 16
	126-3220	32	20	170	12	B 20	A 20
	126-4025	40	25	200	16	B 25	A 25

135 - 136 BORING AND FACING TOOL

ISO - 9

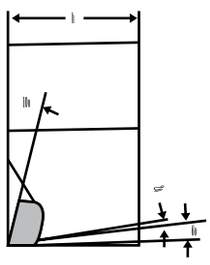


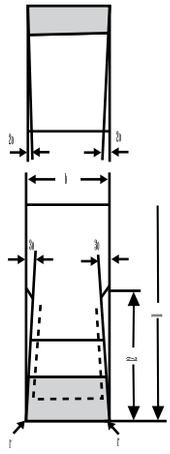


Shank Section	Tool No.	h mm	b mm	d mm	c mm	l1 mm	l2 mm	Smallest bore size mm	Tip
	135-0808	8	8	8	3	125	40	1A	A 5
	135-1010	10	10	10	4	150	50	18	A 6
	135-1212	12	12	12	5	180	63	21	A 8
	135-1616	16	16	16	6	210	80	27	A 10
	135-2020	20	20	20	8	250	100	34	A 12
	135-2525	25	25	25	10	300	125	43	A 16
	135-3232	32	32	32	12	355	160	52	A 20
							h1		
	136-8	-	-	8	3	125	7.5	14	A 5
	136-10	-	-	10	4	150	9.5	18	A 6
	136-12	-	-	12	5	180	11.5	21	A 8
	136- 16	-	-	16	6	210	13.5	27	A 10
	136- 20	-	-	20	8	250	19.5	34	A 12
	136-25	-	-	25	10	300	24.5	43	A 16
	136-32	-	-	32	12	355	31.5	52	A 20

ISO 4

127 RECESSING TOOL

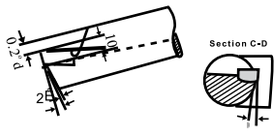


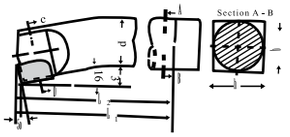


Shank Section	Tool No.	h mm	b mm	l mm	C mm	Tip
	127-1010	10	10	90	10	C 10
	127-1212	12	12	100	12	C 12
	127-1616	16	16	110	16	C 16
	127-2020	20	20	125	20	C 20
	127-2525	25	25	140	25	C 25
	127-3232	32	32	170	32	C 32
	127-1610	16	10	110	16	C 10
	127-2012	20	12	125	20	C 12
	127-2516	25	16	140	25	C 16
	127-3220	32	20	170	32	C 20
	127-4025	40	25	200	40	C 25

ISO -8

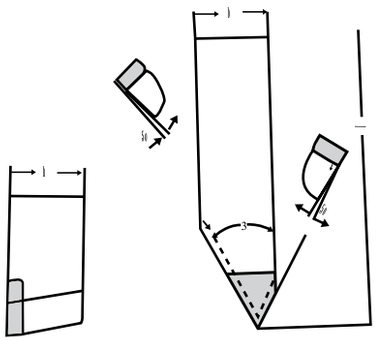
130-131 BORING TOOL





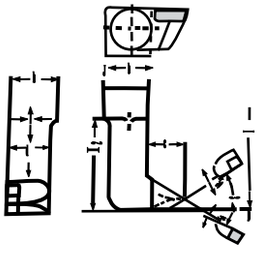
Shank Section	Tool No.	h mm	b mm	d mm	C mm	l1 mm	l2 mm	Smallest bore size mm	Tip
	130-0808	8	8	8	3	125	40	14	A 5
	130-1010	10	10	10	4	150	50	18	A 6
	130-1212	12	12	12	5	180	63	21	A 8
	130-1616	16	16	16	6	210	80	27	A 10
	130-2020	20	20	20	8	250	100	34	A 12
	130-2525	25	25	25	10	300	125	43	A 16
	130-3232	32	32	32	12	355	160	52	A 20
	131-8	-	-	8	3	125	7.5	14	A 5
	131-10 -	-	10	4	150	9.5	18	A 6	
	131-12 -	-	12	5	180	11.5	21	A 8	
	131-16 -	-	16	6	210	13.5	27	A 10	
	131-20 -	-	20	8	250	19.5	34	A 12	
	131-25 -	-	25	10	300	24.5	43	A 16	
	131-32 -	-	32	12	355	31.5	52	A 20	

165 STRAIGHT THREADING TOOL



Shank Section	Tool No.	h mm	b mm	l mm	Tip
	165-1010	10	10	90	E 4
	165-1212	12	12	100	E 5
	165-1616	16	16	110	E 6
	165-2020	20	20	125	E 8
	165-2525	25	25	140	E 10
	165-3232	32	32	170	E 12
	165-1610	16	10	110	E 5
	165-2012	20	12	125	E 6
	165-2516	25	16	140	E 8
	165-3220	32	20	170	E 10
	165-4025	40	25	200	E 12

166 INTERNAL THREADING TOOL

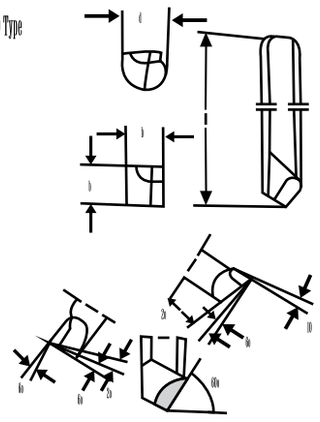


Shank Section	Tool No.	h mm	b mm	d mm	C mm	l1 mm	l2 mm	Smallest bore size mm	Tip
	166-1010	10	10	9	12	100	30	24	E 4
	166-1212	12	12	11	14	110	35	30	E 5
	166-1616	16	16	15	16	140	45	36	E 6
	166-2020	20	20	18	18	160	55	45	E 8
	166-2525	25	25	22	20	200	65	55	E 10
	166-3232	32	32	28	25	250	75	70	E 12

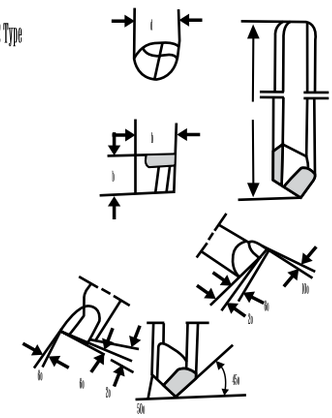
MIRANDA TOOLS®

140-142 BORING TOOL

140 Type



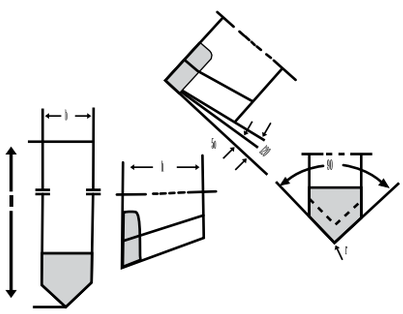
142 Type



b = h 11
SHANK TOLERANCES d = h 8

Shank	Tool No.	b/d mm/inch	l mm	h mm/inch	Tip RH	Tip LH
	141-0006	6	18	5.5	A 6	B 6
	141-0008	8	24	7.5	A 6	B 6
	141-0010	10	50	8.5	A 8	B 8
	141-0012	12	60	10.5	A 10	B 10
	141-0016	16	90	14.0	A 12	B 12
	141-0020	20	120	17.0	A 16	B 16
	141-0025	25	175	22.0	A 20	B 20
	141-0606	6	18		A 6	B 6
	141-0808	8	24		A 6	B 6
	141-1010	10	50		A 8	B 8
	141-1212	12	60		A 10	B 10
	141-1616	16	90		A 12	B 12
	141-2020	20	120		A 16	B 16
	141-2525	25	175		A 20	B 20
	E.141. 3/8"	3/8"	50	21/64"	A 8	B 8
	E.141. 1/2"	1/2"	60	27/64"	A 10	B10
	E.141. 5/8"	5/8"	90	35/64"	A 12	B 12
	E.141. 3/4"	3/4"	120	43/64"	A 16	B 16
	E.141. 1.0"	1.0"	175	7/8"	A 20	B 20
	E.141. 3/8"	3/8"	50		A 8	B 8
	E.141. 1/2"	1/2"	60		A 10	B 10
	E.141. 5/8"	5/8"	90		A 12	B 10
	E.141. 3/4"	3/4"	120		A 16	B 12
	E.141. 1.0"	1.0"	175		A 20	B 20

163 STRAIGHT TURNING TOOL & GROOVING TOOL



Shank Section	Tool No.	h mm	b mm	l mm	Tip
	163-1010	10	10	90	F 10
	163-1212	12	12	100	F 12
	163-1616	16	16	110	F 16
	163-2020	20	20	125	F 20
	163-2525	25	25	140	F 25
	163-3232	32	32	170	F 32
	163-1610	16	10	110	F 10
	160-2012	20	12	125	F12
	163-2516	25	16	140	F 16
	163-3220	32	20	170	F 20

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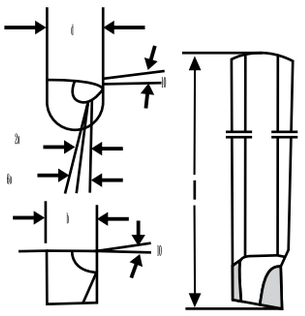
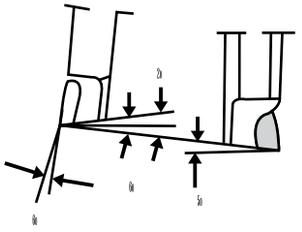
141 BORING TOOL

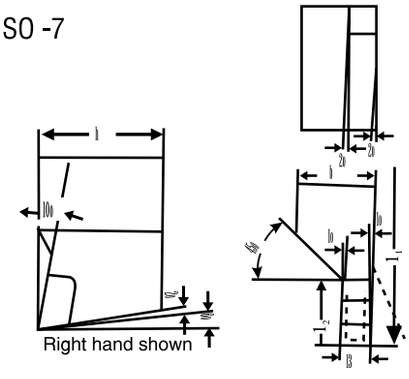




Right hand shown
SHANK TOLERANCES
B=h 11
D=h 8

Shank	Tool No.	b/d mm/inch	l mm	h mm/inch	Tip RH	Tip LH
	141-0006	6	18	5.5	A 6	B 6
	141-0008	8	24	7.5	A 6	B 6
	141-0010	10	50	8.5	A 8	B 8
	141-0012	12	60	10.5	A 10	B 10
	141-0016	16	90	14.0	A 12	B 12
	141-0020	20	120	17.0	A 16	B 16
	141-0025	25	175	22.0	A 20	B 20
	141-0606	6	18		A 6	B 6
	141-0808	8	24		A 6	B 6
	141-1010	10	50		A 8	B 8
	141-1212	12	60		A 10	B 10
	141-1616	16	90		A 12	B 12
	141-2020	20	120		A 16	B 16
	141-2525	25	175		A 20	B 20
	E.141. 3/8"	3/8"	50	21/64"	A 8	B 8
	E.141. 1/2"	1/2"	60	27/64"	A 10	B 10
	E.141. 5/8"	5/8"	90	35/64"	A 12	B 12
	E.141. 3/4"	3/4"	120	43/64"	A 16	B 16
	E.141. 1.0"	1.0"	175	7/8"	A 20	B 20
	E.141. 3/8"	3/8"	50		A 8	B 8
	E.141. 1/2"	1/2"	60		A 10	B 10
	E.141. 5/8"	5/8"	90		A 12	B 12
	E.141. 3/4"	3/4"	120		A 16	B 16
	E.141. 1.0"	1.0"	175		A 20	B 20

ISO -7

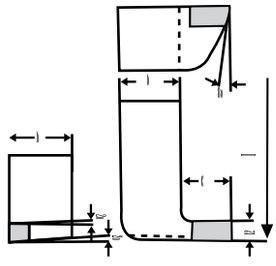


Right hand shown

150 PARTING TOOL

Shank	Tool No.	h mm	b mm	l1 mm	l2 mm	l3 mm	Tip
	150-1006	10	6	90	10	3	D 3
	150-1208	12	8	100	12	3	D 3
	150- 1610	16	10	110	14	4	D 4
	150-2012	20	12	125	16	5	D 5
	150-2516	25	16	140	20	6	D 6
	150-3220	32	20	170	25	8	D 8
	150-4025	40	25	200	32	10	D 10

156 CRANKED INTERNAL RECESSING TOOL



Right hand shown

Shank	Tool No.	h mm	b mm	c mm	l1 mm	l2 mm	Smallest bore size mm	Tip
	156-1010	10	10	9	100	3	25	D 3
	156-1212	12	12	11	110	4	30	D 4
	156- 1616	16	16	14	140	5	40	D 5
	156-2020	20	20	18	160	6	50	D 6
	156-2525	25	25	20	200	8	60	D 8
	156-3232	32	32	28	250	10	85	D 10
	156-4040	40	40	30	315	12	100	D 12

MIRANDA TOOLS®

GUIDE TO MACHINING

Feed		0.1mm - 0.3mm	0.25mm-0.5mm	0.4mm - 1.0mm	above 0.80 mm	Working angles	
Depth of cut		1mm - 3mm	3mm - 6mm	6mm - 12mm	above 10 mm	Clearance Angle Degrees	Side rake Angle Degrees
Material Designation	Brinell Hardness HB	CUTTING SPEED IN M / MIN					
Steel Containing 0.25 - .035% C Containing 0.35 - 0.45% C Containing 0.45 - 0.60% C Over 0.6% C	up to 150 150 - 200 200 - 250 250 - 315	P10 220 - 110 200 - 100 150 - 80 110 - 50	P20 and P25 170 - 80 150 - 70 120 - 55 80 - 36	P20 and P30 110 - 60 100 - 55 75 - 40 50 - 25	P40 70 - 30 65 - 30 50 - 25	5-8 5-8 5-8 5-8	12 -18 12 12 6
Alloy steel	315 - 400	P10 75 - 30	P10 and P20 50 - 20			5 - 8	6
	above 400	M 10 and K 10 40 - 15				5 - 8	6
Stainless Steel		P10 and M 10 150 - 80	P20 120 - 60	Cutting edge with high surface finish required (diamond lapping)			
Cast Steel	up to 150 150 - 200 200 - 250 250 - 315	P20 and P20 200 - 100 160 - 90 140 - 75 100 - 50	P 25 160 - 70 120 - 60 100 - 50 60 - 30	P 30 100 - 50 90 - 45 75 - 40 45 - 25	P 40 60 - 30 50 - 25 45 - 25 30 - 20	5-8 5-8 5-8 5-8	12 6 - 12 6 - 12 0
Grey Iron	up to 170 170 - 230 above 230	K 10 100 - 60 100 - 55 90 - 40	K 10 90 - 50 75 - 45 70 - 30	P 30 and K 20 70 - 40 65 - 35 50 - 20		5-8 5-8 5-8	6 - 12 6 - 8 0 - 6
Malleable iron, black - heart Malleable iron, White - heart		P 20 and M 10 150 - 80 120 - 60	P 20 and P 10 120 - 60 100 - 50			5-8 5-8	6 - 12 6 - 12
Chilled iron	up to 80 Shore	K 10 10 - 5	Skin turning (low cutting depth and high feed)			6	0
	above 80 Shore	K 10 5 - 1.5				6	0
Copper, Brass, Bronze		K 20 500 - 400 400 - 300	K 20 400 - 310 300 - 250			10 80 - 10	18 - 25
Alluminium alloys	up to 80 - 120	K 10 and K 20 1000 - 600 800 - 500	K 20 800 - 500 600 - 300			10 10	20 - 30 12 - 20
Alluminium alloys containing Si	above 120	K 10 200 - 150	K 10 150 - 80			10	12

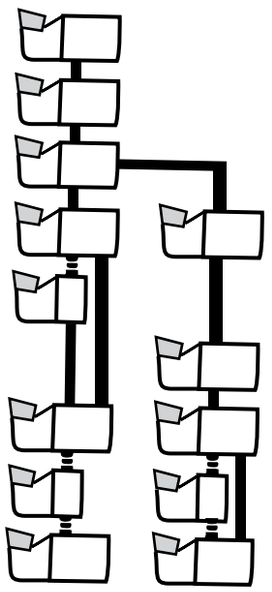
MIRANDA TOOLS®

GRINDING CARBIDE TOOLS

INSTRUCTIONS

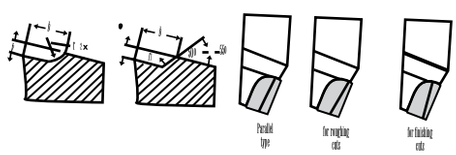
(1) Use only true - running, properly dressed grinding wheels.
(2) Wet grinding is preferable to dry. A copious and constant supply of coolant should be directed to the tip.
(3) Always grind against the cutting adge. i.e. from tip to shank and never use, heay use, heavy pressure. The finish ground tip must neither shine nor shoe any discolouring.
(4) Alwasys use a gauge when grinding tool angles. The face of the chip breaker should also be ground true and square.
(5) Never quench hot tools in water.
(6) Check tool after grinding and before use.

TOOL GRINDING DATA

Grinding Operations		Grinding Wheel				Peripheral Speed m/sec.	Grinding Method
		Type	Abrasive	Grit	Grade of Bond		
Grinding shank base of new tools		Cup wheel or cylinder	Corundum	36...46	H...K	18 - 25	Machine
Grinding clearance on shank		Straight wheel	Corundum	36...46	M...N	18 - 25	Ofihand
Rough grinding tip		Straight or cup wheel	Silicon carbide	36...46	L....K	12 - 20	Ofihand
						6 - 12	Machine
Finish grinding tip		Cup wheel	Silicon carbide	80...100	L....K	12 - 18	Ofihand
Grinding primary rake land			Diamond	D 100..D 70	Metal		
or Grinding chip breaker into tip		Straight or	Silicon carbide	150...200	J...K	12 - 18	Ofihand
		cup wheel	Diamond	D 100..D 70	Plastic or Metal		
Grinding clearance lands		Straight or	Silicon carbide	100...200	K...M	12 - 18	Ofihand
		cup wheel	Diamond	D 100..D 70	Plastic or Metal		
Fine grinding tip (for precision tools)		Cup wheel	Silicon carbide	180...220	J...K	12 - 18	Ofihand
			Diamond	D 50...D 30	Plastic or Metal		
Honing Cutting edge*		Cup wheel	Diamond	D 15..D 7	Plastic	12 - 18	Ofihand
		Hand hone	Silicon or boron carbide	Not coarser than used for preceding grind	Commercial type	The from and extent of the chanter honed on the machining conditions. it is essential to hone the cutting edge if the tool is to be used for roughing or interrupted cuts.	
		Diamond lap	Diamond				

Chip Breaker Dimensions

Tensile strength of work tons/sq.in	Wide (b) when using feeds (s) of under 0.5 mm	over 0.5 mm	Depth mm
Up to 48	12x to 8xs	1mm + 6xs	0.6-0.8
From 48 to 63	10x to 7xs	1mm + 5xs	0.4+0.6
Over 63	9x to 6xs	1mm + 4xs	0.3+0.4



(1) The larger multipliers apply to smaller feeds and vice versa.

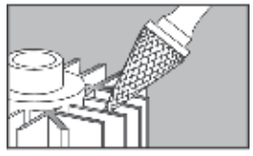
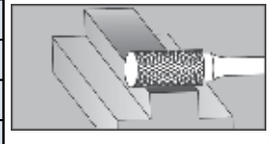
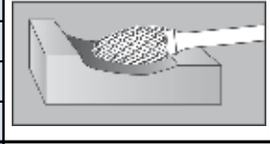
MIRANDA TOOLS®

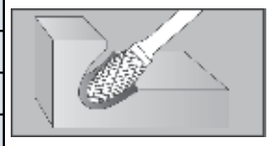
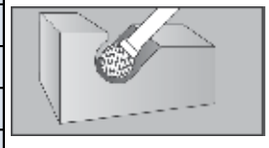
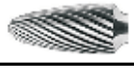
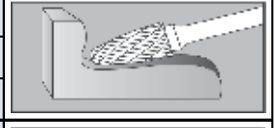
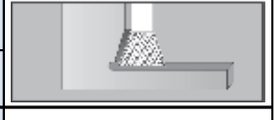
MIRANDA MaxX

Deburring Technology

MIRANDA MaxX®

TUNGSTEN CARBIDE ROTARY BURRS

SHAPE	MIRANDA CODE	DESCRIPTION HEAD DIA X HEAD LENG TH X OAL LENGTH X SHANK DIA	INCLUDE ANGLE	NO OF TEETH	APPLICATIONS
CONICAL 	MAM1	3MM X 11MM X 38MM X 3SHK	20	10	
	MAM2	6MM X 11MM X 38MM X 3SHK	30	18	
	AM1	6MM X 19MM X 60MM X 6SHK	17	15	
	AM2	10MM X 20MM X 70MM X 6SHK	24	20	
	AM3	12MM X 25MM X 75MM X 6SHK	28	24	
	AM4	10MM X 12MM X 60MM X 6SHK	90	20	
	AM5	16MM X 13MM X 63MM X 6SHK	90	30	
	AM6	16MM X 16MM X 66MM X 6SHK	60	30	
CYLINDRICAL RADIUS END 	MBM1	3MM X 16MM X 38MM X 3SHK		10	
	MBM2	6MM X 13MM X 38MM X 3SHK		18	
	BM1	6MM X 20MM X 50MM X 6SHK		15	
	BM2	8MM X 20MM X 70MM X 6SHK		18	
	BM3	10MM X 20MM X 70MM X 6SHK		20	
	BM4	12MM X 20MM X 70MM X 6SHK		24	
	BM5	16MM X 25MM X 75MM X 6SHK		30	
	BM6	12MM X 25MM X 75MM X 6SHK		24	
CYLINDRICAL 	MCM1	3MM X 16MM X 38MM X 3SHK		10	
	MCM2	6MM X 6MM X 38MM X 3SHK		18	
	MCM3	6MM X 13MM X 38MM X 3SHK		18	
	CM1	4MM X 15MM X 50MM X 6SHK		12	
	CM2	6MM X 20MM X 60MM X 6SHK		15	
	CM3	8MM X 20MM X 70MM X 6SHK		18	
	CM4	10MM X 20MM X 70MM X 6SHK		20	
	CM5	12MM X 20MM X 70MM X 6SHK		24	
	CM6	16MM X 25MM X 75MM X 6SHK		30	
	CM7	12MM X 16MM X 65MM X 6SHK		24	
	CM8	12MM X 25MM X 75MM X 6SHK		24	
FLAME 	FM1	6MM X 15MM X 50MM X 6SHK		15	
	FM2	8MM X 20MM X 70MM X 6SHK		18	
	FM3	10MM X 25MM X 65MM X 6SHK		20	
	FM4	12MM X 32MM X 82MM X 6SHK		24	
CONE RADIUS 	MKM1	3MM X 8MM X 38MM X 3SHK		10	
	MKM2	6MM X 12MM X 38MM X 3SHK	10	15	
	KM1	10MM X 20MM X 65MM X 6SHK	16	20	
	KM2	12MM X 20MM X 70MM X 6SHK	24	24	
	KM3	16MM X 33MM X 75MM X 6SHK	17	30	

SHAPE	MIRANDA CODE	DESCRIPTION HEAD DIA X HEAD LENG TH X OAL LENGTH X SHANK DIA	INCLUDE ANGLE	NO OF TEETH	APPLICATIONS
OVAL 	MOM1	3MM X 8MM X 38MM X 3SHK		10	
	MOM2	6MM X 10MM X 38MM X 3SHK		15	
	OM1	8MM X 14MM X 60MM X 6SHK		18	
	OM2	12MM X 20MM X 70MM X 6SHK		24	
	OM3	16MM X 25MM X 75MM X 6SHK		30	
	OM4	6MM X 10MM X 60MM X 6SHK		15	
BALL 	MSM1	4MM X 3MM X 38MM X 3SHK		12	
	MSM2	5MM X 4MM X 38MM X 3SHK		15	
	SM1	6MM X 5MM X 50MM X 6SHK		15	
	SM2	8MM X 7MM X 50MM X 6SHK		18	
	SM3	10MM X 9MM X 60MM X 6SHK		20	
	SM4	12MM X 11MM X 60MM X 6SHK		24	
	SM5	16MM X 14MM X 65MM X 6SHK		30	
TREE POINTED END 	MTM1	3MM X 13MM X 38MM X 3SHK		10	
	MTM2	3MM X 16MM X 38MM X 3SHK		10	
	MTM3	6MM X 13MM X 38MM X 3SHK		15	
	TM1	6MM X 20MM X 70MM X 6SHK		15	
	TM2	10MM X 20MM X 70MM X 6SHK		20	
	TM3	12MM X 25MM X 75MM X 6SHK		24	
	TM4	16MM X 30MM X 80MM X 6SHK		30	
TREE RADIUS END 	TBM1	6MM X 20MM X 70MM X 6SHK		15	
	TBM2	10MM X 20MM X 70MM X 6SHK		20	
	TBM3	12MM X 25MM X 75MM X 6SHK		24	
INVERTED CONE 	MIM1	3MM X 8MM X 38MM X 3SHK	10	10	
	MIM2	6MM X 8MM X 38MM X 3SHK	15	18	
RIM 	RM1	10MM X 2MM X 50MM X 6SHK		20	
	RM2	20MM X 6MM X 60MM X 6SHK		40	
	RM3	12MM X 10MM X 60MM X 6SHK		24	
SET OF 5 PIECES		AM3, BM4, CM5, TM3, SM4			