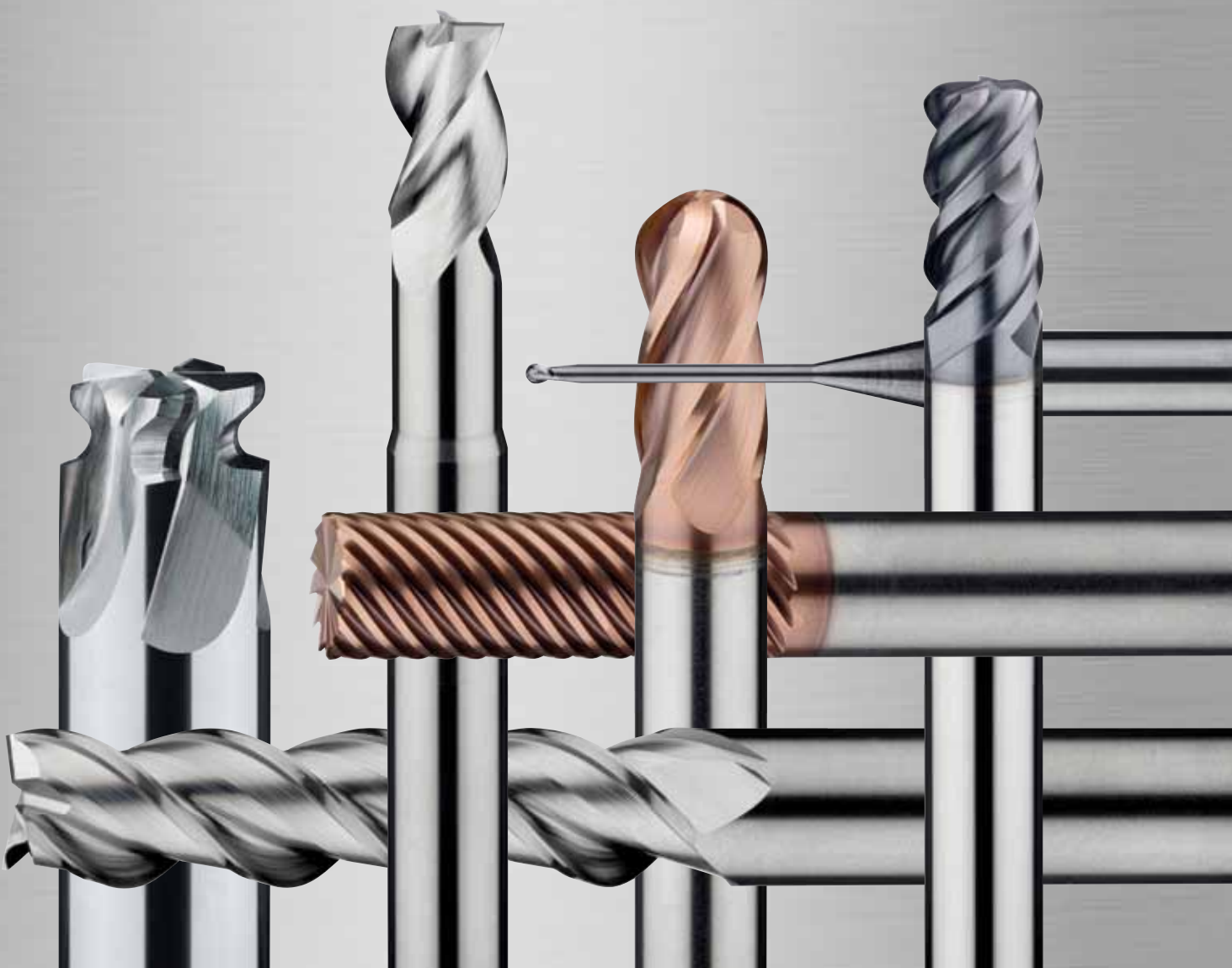




Industrial Tooling Corporation Ltd.

Product Catalogue Issue 10



Company Profile

ITC is a round tool specialist. Our objective is simply to provide you, our customer, with the correct cutting tool at the right time. We are confident that the products that we supply and manufacture are the best available for each task.

To achieve this, we continue to invest in the right team of time served engineers, equipped with a full CAD-CAM facility dedicated to the design and manufacture of precision cutting tools.

Whatever your requirement, from a one-off special to 1000 pieces, ITC can provide your company with a cutting tool that works.

BETTER BY DESIGN BETTER BY ITC

ITC's state-of-the-art production facility includes CNC grinding machines from world leading manufacturers, including Walter, Schneeberger, Deckel, Rollomatic and Anca. We have invested in a centralised oil filtration system to ensure that grinding takes place under optimum conditions with clean oil, and our inspection department includes computerised laser measuring equipment, to maintain the high standards for which ITC is renowned.

We source and stock the best available products from around the world, and hold over 100,000 HSS Co and Solid Carbide tools on the shelf ready for immediate despatch. ITC can also provide a fast modification service – even same day in some cases.

We provide same day despatch on standard stocked lines, whatever your industry sector may be. From production sub-contractor to tool room, through aerospace, motor sport, and the medical industry, from milling, drilling and reaming to de-burring, ITC has the tools and expertise to solve your problem.

As a specialist tooling supplier, we believe that good customer service is the key to success for ITC and our customers. We stock and manufacture the best quality products, whether standard or special, and our staff are trained to provide the best back-up to our customers.

Whether you know the tool that you require, or simply know that you “have to cut this bit of material”, our technical representatives and internal technical team are qualified to give advice that is second to none.

ITC — AN EASY COMPANY TO DO BUSINESS WITH

We believe that we offer an unbeatable combination of first class service, rapid response, huge stocks, plus access to a diverse and ever growing product line. Our continued investment in state-of-the-art CNC grinding equipment gives us the capacity to rapidly manufacture specials to customer requirements, and to return tools to “as new” condition.

More manufacturing companies than ever before, both in the UK and abroad, are relying on ITC to solve their manufacturing problems.



ITC - The Specialist in Specials

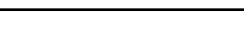
Not only does ITC manufacture and stock an extensive range of standard application driven tools, we also offer a “made to order” specials manufacturing service which is second to none.

Our objective is simply to provide you, our customer, with the correct cutting tool at the right time. We are confident that the the products which we supply and manufacture are the best available for each task.

To achieve this, we have invested heavily in both people and equipment. Our Manufacturing and Tooling Engineers have huge experience in the design and manufacture of round cutting tools.

ITC are approved suppliers to major Aerospace companies in the UK and around the world. The biggest names in Aerospace, Defence, Motor Sport and Tool Making rely on ITC - so can you.

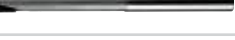
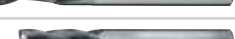


Tool	Series No./Description	ALUMINIUM & NON FERROUS	STEEL & EXOTICS	GRAPHITE, GLASS & CARBON FIBRE	GENERAL PURPOSE	PAGE
	2001 2 Flute End Mills Long Reach For Aluminium	✓✓✓				8
	2001 2 Flute Long Reach with Radius For Aluminium	✓✓✓				9
	2051 2 Flute Single End - Reduced Shank	✓✓✓				10
	2031 2 Flute Single End Long Reach For Aluminium	✓✓✓				11
	2081 2 Flute Long Reach End Mills For Aluminium - Reduced Shank	✓✓✓				12
	2131 2 Flute XLS End Mill Long Reach For Aluminium	✓✓✓				13
	2201 2 Flute Long Length End Mill For Aluminium	✓✓✓				14
	2201 2 Flute Long Length End Mill For Aluminium with Radius	✓✓✓				15
	2041 2 Flute End Mill	✓✓✓				16
	2041 2 Flute End Mill with Radius	✓✓✓				17
	2161 2 Flute End Mill For Aluminium	✓✓✓				18
	2161 2 Flute End Mill For Aluminium, with Radius	✓✓✓				19
	3091 3 Flute Long Reach End Mills For Aluminium	✓✓✓				20
	3091 Series 3 Flute Long Reach End Mills For Aluminium with Radius	✓✓✓				21
	3001 3 Flute End Mills Long Reach For Aluminium	✓✓✓				23
	3201 Series 3 Flute Long Length End Mill For Aluminium	✓✓✓				24
	3051 3 Flute Long Length	✓✓✓				25
	3051 Series 3 Flute Long Length End Mill For Aluminium with Radius	✓✓✓				26
	3041 3 Flute Single End	✓✓✓				27
	3041 3 Flute Single End with Radius	✓✓✓				28
	3081 3 Flute End Mill	✓✓✓				29
	3081 3 Flute End Mill For Aluminium with Radius	✓✓✓				30
	5011 Multi Flute Single End	✓✓✓				31
	2082 2 Flute Ball Nose End Mill - Reduced Shank	✓✓✓				32
	2142 2 Flute XLS Ball Nose End Mill Long Reach For Aluminium	✓✓✓				33
	2022 2 Flute Ball Nose End Mill Long Reach For Aluminium	✓✓✓				34
	2172 Series 2 Flute Ball Nose End Mill For Aluminium	✓✓✓				35
	2052 2 Flute Ball Nose End Mill	✓✓✓				36
	180-10 Single Flute End Mill	✓✓✓				37
	180-10-A Single Flute End Mill - Reinforced Shank	✓✓✓				38
	180-10 ST Single Flute Stub End Mill	✓✓✓				39
	180-10-LG Single Flute End Mill but with extra length of cut	✓✓✓				40
	180-10-STA Single Flute End Mill, short overall length	✓✓✓				41

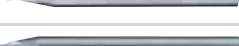
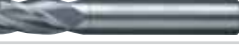
✓ GOOD

✓✓ VERY GOOD

✓✓✓ EXCELLENT

Tool	Series No./Description	ALUMINIUM & NON FERROUS	STEEL & EXOTICS	GRAPHITE, GLASS & CARBON FIBRE	GENERAL PURPOSE	PAGE
	180-12 2 Flute Straight Flute Router	✓✓✓				42
	180-13 3 Flute Straight Flute Router	✓✓✓				43
	180-62 2 Flute Spiral Flute Router	✓✓✓				44
	180-63 3 Flute Spiral Flute Router	✓✓✓				45
	2002 / 2012 2 Flute End Mills For Steel	✓	✓✓✓		✓✓✓	47
	2152 2 Flute Ball Nose End Mills for Hard Machining		✓✓✓		✓✓	48
	2162 2 Flute Ball Nose End Mills for Hard Machining	✓	✓✓✓		✓✓✓	49
	4032/4042 4 Flute Ball Nose / 4 Flute Ball Nose long reach for steel	✓	✓✓✓		✓✓	50
	2112 Micro Ball Nose End Mills For Steel	✓	✓✓✓		✓✓✓	51
	4101 4 Flute Ball Nose End Mill		✓✓✓		✓✓✓	52
	5021 5 Flute End Mills, Harmonic Flute Geometry		✓✓✓		✓✓✓	53
	6051 6 Flute End Mills, Harmonic Flute Geometry		✓✓✓		✓✓✓	54
	4081 4 Flute End Mills, Harmonic Flute Geometry		✓✓✓		✓✓✓	55
	7N22 Micro Square End Series	✓	✓✓✓	✓✓✓	✓✓✓	57
	6011 Multi-Flute Carbide End Mill	✓✓	✓✓✓		✓✓✓	59
	6021 Finishing Multi-Flute End Mills	✓✓	✓✓✓		✓✓✓	60
	6021 Finishing Multi-Flute End Mills, with Radius	✓✓	✓✓✓		✓✓✓	61
	6031 Finishing Multi-Flute End Mills	✓✓	✓✓✓		✓✓✓	62
	6031 Finishing Multi-Flute End Mills, with Radius	✓	✓✓✓		✓✓✓	63
	6061 Multi-Flute End Mill For Steel		✓✓✓		✓✓✓	64
	2111 Square Ended PCD End Mills			✓✓✓		66
	2151 2 Flute XLS PCD End Mills			✓✓✓		67
	2102 Ball Nose PCD End Mill			✓✓✓		68
	2132 2 Flute XLS PCD Ball Nose End Mills			✓✓✓		69
	2071 2 Flute Square End End Mill For Graphite	✓		✓✓✓		70
	2071 Diamond Coated End Mills with Radius For Graphite	✓		✓✓✓		71
	2101 2 Flute Square End Diamond Coated End Mill	✓		✓✓✓		72
	4121 4 Flute Diamond Coated End Mill For Graphite	✓		✓✓✓		73
	2072 2 Flute Ball Nose Diamond Coated End Mill, Reinforced Shank	✓		✓✓✓		74
	2092 2 Flute Ball Nose Diamond Coated End Mill	✓		✓✓✓		75
	4072 4 Flute Ball Nose Diamond Coated End Mill	✓		✓✓✓		76
	9001 Multi-Flute Router			✓✓✓		77
	190 Diamond Cut, Multiple Flute Router			✓✓✓		78

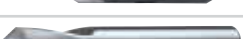
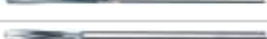
✓ GOOD ✓✓ VERY GOOD ✓✓✓ EXCELLENT

Tool	Series No./Description	ALUMINIUM & NON FERROUS	STEEL & EXOTICS	GRAPHITE, GLASS & CARBON FIBRE	GENERAL PURPOSE	PAGE
	2011 2 Flute Single End, TiALN Coated	✓✓			✓✓✓	80
	3031 3 Flute Single End, TiALN Coated	✓✓	✓✓		✓✓✓	81
	4061 4 Flute Single End, TiALN Coated	✓	✓✓		✓✓✓	82
	4061 with Radius 4 Flute, Square End with Corner Radius, TiALN Coated	✓	✓✓		✓✓✓	83
	2171 Miniature Corner Rounding Cutters	✓✓	✓✓		✓✓✓	85
	4011 Corner Rounding Cutter	✓✓	✓✓		✓✓✓	86
	4071 Chamfer Tool	✓✓	✓✓		✓✓✓	87
	4111 4 Flute Back Chamfering and Countersinking Tool	✓✓✓	✓✓		✓✓✓	88
	2141 2 Flute Drill-Mill 90° Included Angle	✓✓✓	✓✓		✓✓✓	89
	Engraving Tools Solid Carbide 'D' Bits	✓✓✓	✓✓		✓✓✓	90
	4001 XXLS 4 Flute End Mills	✓✓	✓✓✓		✓✓✓	91
	4002 XXLS 4 Flute Ball Nose End Mills	✓✓	✓✓✓		✓✓✓	92
	2121 XXLS 2 Flute Square End End Mills	✓✓	✓✓✓		✓✓✓	93
	2122 XXLS 2 Flute Ball Nose End Mills	✓✓	✓✓✓		✓✓✓	94
	4051 HSSCo Fine Pitch Ripper 4 flute, standard ISO length with weldon flat		✓✓✓		✓✓✓	95
	3011 Disposable High Performance End Mills	✓✓	✓✓✓		✓✓✓	96
	3021 Disposable High Performance End Mills	✓✓	✓✓✓		✓✓✓	97
	3002 Disposable High Performance End Mills	✓✓	✓✓✓		✓✓✓	98
	164-27 2 Flute Miniature End Mills	✓✓✓	✓		✓✓✓	100
	164-27ST 2 Flute Single End Miniature Stub End Mills	✓✓✓	✓✓✓		✓✓✓	101
	164-47 4 Flute Premium Carbide Micro End Mills	✓	✓✓		✓✓✓	102
	155-24 Miniature Miniature 2 Flute Ball Nose High Performance	✓✓✓	✓✓		✓✓✓	103
	155-24 2 Flute Ball Nose	✓✓✓	✓✓		✓✓✓	104
	155-27 2 Flute Single End	✓✓✓	✓✓		✓✓✓	105
	155-34 3 Flute Ball Nose	✓✓	✓✓		✓✓✓	107
	155-37 3 Flute Single End	✓✓	✓✓		✓✓✓	108
	155-44 4 Flute Ball Nose	✓	✓✓✓		✓✓✓	110
	155-47 4 Flute Single End	✓	✓✓✓		✓✓✓	112
	155-27 / 155-37 / 155-47 2, 3 & 4 Flute Single End with Radius	✓✓✓	✓✓		✓✓✓	114
	3152 / 3360 3 Flute Disposable End Mills. TiAlN coated.	✓✓	✓✓		✓✓✓	116
	158-44 4 Flute Ball Nose Tic'N Coated		✓✓✓		✓✓✓	117
	158-47 4 Flute Single End Tic'N Coated		✓✓✓		✓✓✓	118
	160-47 4 Flute Double End Stub		✓✓✓		✓✓✓	119

✓ GOOD

✓✓ VERY GOOD

✓✓✓ EXCELLENT

Tool	Series No./Description	ALUMINIUM & NON FERROUS	STEEL & EXOTICS	GRAPHITE, GLASS & CARBON FIBRE	GENERAL PURPOSE	PAGE
	162-24 2 Flute Ball Nose Long Series	✓✓✓	✓		✓✓✓	120
	162-27 2 Flute Single End Long Series	✓✓✓	✓		✓✓✓	121
	162-44 4 Flute Ball Nose Long Series	✓	✓✓✓		✓✓✓	122
	162-47 4 Flute Single End Long Series	✓	✓✓✓		✓✓✓	123
	163-24 2 Flute Ball Nose Extra Long Series	✓✓	✓✓		✓✓✓	124
	163-27 2 Flute Single End Extra Long Series	✓✓✓	✓		✓✓✓	125
	163-44 4 Flute Ball Nose Extra Long Series	✓	✓✓✓		✓✓✓	126
	163-47 4 Flute Single End Extra Long Series	✓	✓✓✓		✓✓✓	127
	1031 High Performance Solid Carbide Drill 3 x D	✓✓	✓✓✓		✓✓✓	128
	1032 High Performance Solid Carbide Drill - Internal Coolant 3 x D	✓✓	✓✓✓		✓✓✓	130
	1052 High Performance Solid Carbide Drill - Internal Coolant 5 x D	✓✓	✓✓✓		✓✓✓	133
	1082 High Performance Solid Carbide Drill - Internal Coolant 8 x D	✓✓	✓✓✓		✓✓✓	134
	225 Jobber Length Carbide Drill Solid Carbide, straight shank, metric and imperial sizes	✓✓✓	✓✓		✓✓✓	135
	M112 Jobber Length Carbide Drill Similar to 225 series but available in 0.1mm increments	✓✓✓	✓✓		✓✓✓	137
	235 2 Straight Flute Drill	✓	✓✓✓		✓✓✓	139
	240 2 Flute Slow Spiral Drill	✓	✓✓✓		✓✓✓	141
	265 2 Flute Miniature Drill	✓✓✓	✓✓✓		✓✓✓	143
	250 Centre Drills, Solid Carbide, 2 Flute, Double Ended	✓✓✓	✓✓✓		✓✓✓	147
	400 NC Spotting Drill	✓✓✓	✓✓✓		✓✓✓	148
	012611 NC Spotting Drill - Long Series	✓✓✓	✓✓✓		✓✓✓	149
	208 Carbide Reamer	✓✓	✓✓✓		✓✓✓	150
	204 Long Series Carbide Reamer	✓✓	✓✓✓		✓✓✓	152
	208 Made To Order Reamers Carbide Reamer	✓✓	✓✓✓		✓✓✓	153
	204 Made To Order Reamers Long Series Carbide Reamer	✓✓	✓✓✓		✓✓✓	153
	050221 Carbide Reamer - Metric	✓✓	✓✓✓		✓✓✓	154
	220 Boring Tools	✓✓	✓✓✓		✓✓✓	156
	BBM & MBBM Boring Tools Minature / Holders	✓✓	✓✓✓		✓✓✓	157
	110 Solid Carbide or Brazed Shank, Single Flute Counter Sink	✓✓	✓✓		✓✓✓	159
	111 Solid Carbide or Brazed Shank, Multi Flute Counter Sink	✓	✓✓✓		✓✓✓	160
	Carbide Burrs				✓✓✓	161
	Hardness Comparisons					176
	Conversion Table					177
	Conversion Chart					178

2001 Series

2 Flute Long Reach End Mills For Aluminium



Description

2 flute solid carbide square end straight shank, 40° right hand helix, centre cutting, long series, short flute. Manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed for the machining of Aluminium on machines with medium to high spindle speeds. The long reach and short length of cut gives maximum rigidity, whilst “Wipers” on the teeth ends give exceptional surface finish. These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively we can make complete to your specification.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	NECK DIAMETER	PRICE £
2001-3	3	6	75	3	12	2.5	66.11
2001-4	4	6	75	4	15	3.5	66.11
2001-5	5	6	75	5	20	4.5	66.11
2001-6	6	6	100	6	20	5	80.95
2001-8	8	8	100	8	25	7	84.15
2001-10	10	10	100	10	25	9	100.14
2001-12	12	12	100	12	40	11	104.02
2001-14	14	14	125	14	50	13	137.90
2001-16	16	16	125	16	50	14	137.90
2001-18	18	18	125	18	50	16	202.18
2001-20	20	20	150	20	65	18	256.41
2001-25	25	25	150	28	65	23	497.40

N.B. Other sizes and corner radius available on request.

For Speeds & Feeds please see page 46.

2001 Series



2 Flute Long Reach With Radius For Aluminium

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	NECK DIAMETER	RADIUS	PRICE £
2001-3-0.25R	3	6	75	3	12	2.5	0.25	79.79
2001-3-0.5R	3	6	75	3	12	2.5	0.5	79.79
2001-3-1.0R	3	6	75	3	12	2.5	1.0	79.79
2001-4-0.25R	4	6	75	4	15	3.5	0.25	79.79
2001-4-0.5R	4	6	75	4	15	3.5	0.5	79.79
2001-4-1.0R	4	6	75	4	15	3.5	1.0	79.79
2001-5-0.25R	5	6	75	5	20	4.5	0.25	79.79
2001-5-0.5R	5	6	75	5	20	4.5	0.5	79.79
2001-5-1.0R	5	6	75	5	20	4.5	1.0	79.79
2001-6-0.25R	6	6	100	6	20	5	0.25	79.79
2001-6-0.5R	6	6	100	6	20	5	0.5	94.61
2001-6-1.0R	6	6	100	6	20	5	1.0	94.61
2001-6-1.5R	6	6	100	6	20	5	1.5	101.22
2001-6-2.0R	6	6	100	6	20	5	2.0	101.22
2001-8-0.25R	8	8	100	8	25	7	0.25	97.81
2001-8-0.5R	8	8	100	8	25	7	0.5	97.81
2001-8-1.0R	8	8	100	8	25	7	1.0	97.81
2001-8-1.5R	8	8	100	8	25	7	1.5	104.09
2001-8-2.0R	8	8	100	8	25	7	2.0	104.09
2001-8-2.5R	8	8	100	8	25	7	2.5	104.09
2001-8-3.0R	8	8	100	8	25	7	3.0	104.09
2001-10-0.25R	10	10	100	10	25	9	0.25	113.78
2001-10-0.5R	10	10	100	10	25	9	0.5	113.78
2001-10-1.0R	10	10	100	10	25	9	1.0	113.78
2001-10-1.5R	10	10	100	10	25	9	1.5	120.08
2001-10-2.0R	10	10	100	10	25	9	2.0	120.08
2001-10-2.5R	10	10	100	10	25	9	2.5	120.08
2001-10-3.0R	10	10	100	10	25	9	3.0	120.08
2001-12-0.25R	12	12	100	12	40	11	0.25	117.63
2001-12-0.5R	12	12	100	12	40	11	0.5	117.63
2001-12-1.0R	12	12	100	12	40	11	1.0	117.63
2001-12-1.5R	12	12	100	12	40	11	1.5	124.31
2001-12-2.0R	12	12	100	12	40	11	2.0	124.31
2001-12-2.5R	12	12	100	12	40	11	2.5	124.31
2001-12-3.0R	12	12	100	12	40	11	3.0	124.31
2001-14-0.25R	14	14	125	14	50	13	0.25	151.51
2001-14-0.5R	14	14	125	14	50	13	0.5	151.51
2001-14-1.0R	14	14	125	14	50	13	1.0	151.51
2001-16-0.25R	16	16	125	16	50	14	0.25	152.86
2001-16-0.5R	16	16	125	16	50	14	0.5	152.86
2001-16-1.0R	16	16	125	16	50	14	1.0	152.86
2001-16-1.5R	16	16	125	16	50	14	1.5	157.23
2001-16-2.0R	16	16	125	16	50	14	2.0	157.23
2001-16-2.5R	16	16	125	16	50	14	2.5	157.23
2001-16-3.0R	16	16	125	16	50	14	3.0	157.23
2001-16-4.0R	16	16	125	16	50	14	4.0	157.23
2001-20-0.25R	20	20	150	20	65	18	0.25	270.06
2001-20-0.5R	20	20	150	20	65	18	0.5	270.06
2001-20-1.0R	20	20	150	20	65	18	1.0	270.06
2001-20-1.5R	20	20	150	20	65	18	1.5	276.64
2001-20-2.0R	20	20	150	20	65	18	2.0	276.64
2001-20-2.5R	20	20	150	20	65	18	2.5	276.64
2001-20-3.0R	20	20	150	20	65	18	3.0	276.64
2001-20-4.0R	20	20	150	20	65	18	4.0	276.64

For Speeds & Feeds please see page 46.

Email: sales@itc-ltd.co.uk

Website: www.itc-ltd.co.uk

2051 Series

2 Flute Long Reach End Mill For Aluminium - Reduced Shank



Description

2 flute solid carbide Cylindrical Land, straight shank, reduced from cutter diameter, 50° right hand helix, centre cutting, long series short flute. Manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed for the efficient machining of Aluminium on machines with medium to high spindle speeds. The long reach, short length of cut combination gives maximum rigidity, whilst the specially developed geometry delivers optimum performance. The 2051 series is uniquely flexible due to the reduced shank diameter, enabling the tool to be used on both shallow and deep pocket applications without modifications. These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively we can make complete to your specification.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
2051-6	6	5	100	6	80.95
2051-8	8	7	100	8	84.15
2051-10	10	9	100	10	100.14
2051-12	12	11	100	12	104.02
2051-14	14	12	125	14	165.70
2051-16	16	14	125	16	201.36
2051-18	18	16	125	18	236.46
2051-20	20	18	150	20	287.70

For Speeds & Feeds please see page 46.

2031 Series

2 Flute Long Reach For Aluminium With Cylindrical Land



Description

Similar to 2041 but with added reach and rigidity, due to reduced neck and short length of cut.

Application

High Speed Machine of Aluminium where surface finish is critical, most useful on very rigid machines and set-ups.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	NECK DIAMETER	PRICE £
2031-6	6	6	100	6	20	5	80.95
2031-8	8	8	100	8	25	7	84.15
2031-10	10	10	100	10	25	9	100.14
2031-12	12	12	100	12	40	11	104.02
2031-14	14	14	125	14	50	13	137.90
2031-16	16	16	125	16	50	14	137.90
2031-20	20	20	150	20	65	18	256.41

For Speeds & Feeds please see page 46.

2081 Series

2 Flute Long Reach End Mill For Aluminium - Reduced Shank



Description

Similar to 2001 but with reduced shank for extra flexibility.

Application

Designed for the machining of Aluminium on machines with medium to high spindle speeds. The long reach and short length of cut gives increased rigidity, whilst the reduced shank diameter gives unique flexibility, enabling the machining of both deep and shallow applications with the same tool without modification.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
2081-6	6	5	100	6	80.95
2081-8	8	7	100	8	84.15
2081-10	10	9	100	10	100.14
2081-12	12	11	100	12	104.02
2081-16	16	14	125	16	201.36
2081-20	20	18	150	20	287.70

For Speeds & Feeds please see page 46.

2131 Series

2 Flute XLS End Mill For Aluminium



Description

2 flute solid carbide square end, straight shank, 40° right hand helix, centre cutting, short flute, extra long overall length, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed for the machining of Aluminium on machines with medium to high spindle speeds. The extra long overall length enables machining of deep applications with a short length of cut for maximum rigidity, whilst “Wipers” on the teeth ends give exceptional surface finish. These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively we can make complete to your specification.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	NECK DIAMETER	PRICE £
2131-6	6	6	150	6	20	5	88.34
2131-8	8	8	150	8	25	7	95.41
2131-10	10	10	150	10	25	9	112.22
2131-12	12	12	150	12	40	11	129.38
2131-14	14	14	175	14	50	13	242.49
2131-16	16	16	200	16	50	14	287.37
2131-18	18	18	200	18	50	16	376.73
2131-20	20	20	200	20	65	18	402.19

For Speeds & Feeds please see page 46.

2201 Series

2 Flute Long Length End Mill For Aluminium



Description

2 flute, long series, solid carbide, square end, straight shank, right hand helix, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed to give extremely high performance in the machining of Aluminium and other non-ferrous materials. The radical flute geometry gives exceptional swarf clearance and excellent surface finish at high feed rates.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
2201-3	3	6	75	15	40.60
2201-4	4	6	75	20	42.85
2201-5	5	6	75	25	50.03
2201-6	6	6	100	35	53.35
2201-8	8	8	100	45	67.49
2201-10	10	10	100	45	72.20
2201-12	12	12	100	50	103.80
2201-16	16	16	150	60	200.31
2201-20	20	20	150	80	254.95

For Speeds & Feeds please see page 46.

2201 Series

2 Flute Long Length End Mill For Aluminium With Radius



Description

2 flute, long series, solid carbide, square end, straight shank, right hand helix, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide supplied with corner radius.

Application

Designed to give extremely high performance in the machining of Aluminium and other non-ferrous materials. The radical flute geometry gives exceptional swarf clearance and excellent surface finish at high feed rates.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £
2201-3-0.5R	3	6	75	15	0.5	46.70
2201-3-1.0R	3	6	75	15	1.0	60.84
2201-4-0.5R	4	6	75	20	0.5	56.45
2201-4-1.0R	4	6	75	20	1.0	67.70
2201-5-0.5R	5	6	75	25	0.5	64.59
2201-5-1.0R	5	6	75	25	1.0	75.95
2201-6-0.5R	6	6	100	35	0.5	67.70
2201-6-1.0R	6	6	100	35	1.0	78.84
2201-8-0.5R	8	8	100	45	0.5	80.66
2201-8-1.0R	8	8	100	45	1.0	83.55
2201-8-1.5R	8	8	100	45	1.5	83.55
2201-10-0.5R	10	10	100	45	0.5	81.41
2201-10-1.0R	10	10	100	45	1.0	86.12
2201-10-1.5R	10	10	100	45	1.5	86.12
2201-10-2.0R	10	10	100	45	2.0	86.12
2201-12-0.5R	12	12	100	50	0.5	112.37
2201-12-1.0R	12	12	100	50	1.0	114.30
2201-12-1.5R	12	12	100	50	1.5	114.30
2201-12-2.0R	12	12	100	50	2.0	114.30
2201-16-0.5R	16	16	150	60	0.5	208.88
2201-16-1.0R	16	16	150	60	1.0	212.10
2201-16-1.5R	16	16	150	60	1.5	212.10
2201-16-2.0R	16	16	150	60	2.0	212.10
2201-20-0.5R	20	20	150	80	0.5	268.52
2201-20-1.0R	20	20	150	80	1.0	266.73
2201-20-1.5R	20	20	150	80	1.5	266.73
2201-20-2.0R	20	20	150	80	2.0	266.73

N.B. Other sizes and radii available on request. For Speeds & Feeds please see page 46.

2041 Series

2 Flute End Mill For Aluminium



Description

2 flute, solid carbide, single end, standard length, square end, straight shank, 55° right hand helix, right hand cut, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed to give extremely high performance in the machining of Aluminium and other soft non-ferrous materials. The radical flute geometry gives exceptional swarf clearance, whilst the circular land and end teeth "Wipers" combine to give unparalleled surface finish.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
2041-3	3	3	38	12	24.32
2041-4	4	4	50	15	25.28
2041-5	5	5	50	20	25.82
2041-6	6	6	64	20	26.36
2041-8	8	8	64	22	39.75
2041-10	10	10	70	27	53.69
2041-12	12	12	76	27	73.08
2041-14	14	14	90	30	110.92
2041-16	16	16	90	35	127.73
2041-18	18	18	90	35	157.10
2041-20	20	20	100	40	166.26

For Speeds & Feeds please see page 46.

2041 Series

2 Flute End Mill For Aluminium With Radius



Description

2 flute solid carbide, single end, standard length, square end, straight shank, 55° right hand helix, right hand cut, centre cutting, supplied with corner radius.

Application

Designed to give extremely high performance in the machining of Aluminium and other soft non-ferrous materials. The radical flute geometry gives excellent swarf clearance for rapid metal removal.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £	CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £
2041-3-0.25R	3	3	38	12	0.25	32.51	2041-10-2.0R	10	10	70	27	2.0	66.11
2041-3-0.5R	3	3	38	12	0.5	32.51	2041-10-3.0R	10	10	70	27	3.0	66.11
2041-3-0.75R	3	3	38	12	0.75	32.51	2041-12-0.25R	12	12	76	27	0.25	80.20
2041-3-1.0R	3	3	38	12	1.0	42.76	2041-12-0.5R	12	12	76	27	0.5	80.20
2041-4-0.25R	4	4	50	15	0.25	37.68	2041-12-0.75R	12	12	76	27	0.75	81.83
2041-4-0.5R	4	4	50	15	0.5	37.68	2041-12-1.0R	12	12	76	27	1.0	81.83
2041-4-0.75R	4	4	50	15	0.75	37.68	2041-12-1.5R	12	12	76	27	1.5	81.83
2041-4-1.0R	4	4	50	15	1.0	47.82	2041-12-2.0R	12	12	76	27	2.0	81.83
2041-5-0.25R	5	5	50	20	0.25	39.14	2041-12-3.0R	12	12	76	27	3.0	81.83
2041-5-0.5R	5	5	50	20	0.5	39.14	2041-16-0.25R	16	16	90	35	0.25	133.04
2041-5-0.75R	5	5	50	20	0.75	39.14	2041-16-0.5R	16	16	90	35	0.5	133.04
2041-5-1.0R	5	5	50	20	1.0	49.38	2041-16-0.75R	16	16	90	35	0.75	135.50
2041-6-0.25R	6	6	64	20	0.25	39.35	2041-16-1.0R	16	16	90	35	1.0	135.50
2041-6-0.5R	6	6	64	20	0.5	39.35	2041-16-1.5R	16	16	90	35	1.5	135.50
2041-6-0.75R	6	6	64	20	0.75	39.35	2041-16-2.0R	16	16	90	35	2.0	135.50
2041-6-1.0R	6	6	64	20	1.0	49.45	2041-16-3.0R	16	16	90	35	3.0	135.50
2041-6-1.5R	6	6	64	20	1.5	49.45	2041-16-4.0R	16	16	90	35	4.0	135.50
2041-6-2.0R	6	6	64	20	2.0	49.45	2041-16-5.0R	16	16	90	35	5.0	135.50
2041-8-0.25R	8	8	64	22	0.25	50.81	2041-20-0.25R	20	20	100	40	0.25	173.76
2041-8-0.5R	8	8	64	22	0.5	50.81	2041-20-0.5R	20	20	100	40	0.5	173.76
2041-8-0.75R	8	8	64	22	0.75	50.81	2041-20-0.75R	20	20	100	40	0.75	173.76
2041-8-1.0R	8	8	64	22	1.0	53.82	2041-20-1.0R	20	20	100	40	1.0	176.62
2041-8-1.5R	8	8	64	22	1.5	53.82	2041-20-1.5R	20	20	100	40	1.5	176.62
2041-8-2.0R	8	8	64	22	2.0	53.82	2041-20-2.0R	20	20	100	40	2.0	176.62
2041-8-3.0R	8	8	64	22	3.0	53.82	2041-20-3.0R	20	20	100	40	3.0	176.62
2041-10-0.25R	10	10	70	27	0.25	61.73	2041-20-4.0R	20	20	100	40	4.0	176.62
2041-10-0.5R	10	10	70	27	0.5	61.73	2041-20-5.0R	20	20	100	40	5.0	176.62
2041-10-0.75R	10	10	70	27	0.75	66.11							
2041-10-1.0R	10	10	70	27	1.0	66.11							
2041-10-1.5R	10	10	70	27	1.5	66.11							

For Speeds & Feeds please see page 46.

2161 Series

2 Flute End Mill For Aluminium



Description

2 flute, solid carbide, square end, straight shank, right hand helix, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed to give extremely high performance in the machining of Aluminium and other non-ferrous materials. The radical flute geometry gives exceptional swarf clearance and excellent surface finish at high feed rates.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
2161-3	3	3	40	12	26.78
2161-4	4	4	50	15	27.85
2161-5	5	5	50	20	28.49
2161-6	6	6	64	20	29.03
2161-8	8	8	64	22	43.81
2161-10	10	10	70	27	59.13
2161-12	12	12	84	30	80.45
2161-16	16	16	90	35	140.54
2161-20	20	20	100	40	183.18

For Speeds & Feeds please see page 46.

2161 Series

2 Flute End Mill For Aluminium With Radius



Description

2 flute, solid carbide, square end, straight shank, right hand helix, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide supplied with corner radius.

Application

Designed to give extremely high performance in the machining of Aluminium and other non-ferrous materials. The radical flute geometry gives exceptional swarf clearance and excellent surface finish at high feed rates.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £
2161-3-0.25R	3	3	38	12	0.25	35.78
2161-3-0.5R	3	3	38	12	0.5	35.78
2161-3-0.75R	3	3	38	12	0.75	35.78
2161-3-1.0R	3	3	38	12	1.0	53.45
2161-4-0.25R	4	4	50	15	0.25	41.46
2161-4-0.5R	4	4	50	15	0.5	41.46
2161-4-0.75R	4	4	50	15	0.75	41.46
2161-4-1.0R	4	4	50	15	1.0	52.70
2161-5-0.25R	5	5	50	20	0.25	43.06
2161-5-0.5R	5	5	50	20	0.5	43.06
2161-5-0.75R	5	5	50	20	0.75	43.06
2161-5-1.0R	5	5	50	20	1.0	54.42
2161-6-0.25R	6	6	64	20	0.25	43.38
2161-6-0.5R	6	6	64	20	0.5	43.38
2161-6-0.75R	6	6	64	20	0.75	43.38
2161-6-1.0R	6	6	64	20	1.0	54.52
2161-6-1.5R	6	6	64	20	1.5	54.52
2161-6-2.0R	6	6	64	20	2.0	54.52
2161-8-0.25R	8	8	64	22	0.25	55.92
2161-8-0.5R	8	8	64	22	0.5	55.92
2161-8-0.75R	8	8	64	22	0.75	55.92
2161-8-1.0R	8	8	64	22	1.0	59.77
2161-8-1.5R	8	8	64	22	1.5	59.77
2161-8-2.0R	8	8	64	22	2.0	59.77
2161-8-2.5R	8	8	64	22	2.5	59.77
2161-8-3.0R	8	8	64	22	3.0	59.77
2161-10-0.25R	10	10	70	27	0.25	68.02
2161-10-0.5R	10	10	70	27	0.5	68.02
2161-10-0.75R	10	10	70	27	0.75	72.73
2161-10-1.0R	10	10	70	27	1.0	72.73
2161-10-1.5R	10	10	70	27	1.5	72.73
2161-10-2.0R	10	10	70	27	2.0	72.73
2161-10-2.5R	10	10	70	27	2.5	72.73
2161-10-3.0R	10	10	70	27	3.0	72.73
2161-12-0.25R	12	12	84	30	0.25	88.37
2161-12-0.5R	12	12	84	30	0.5	88.37
2161-12-0.75R	12	12	84	30	0.75	90.30
2161-12-1.0R	12	12	84	30	1.0	90.30
2161-12-1.5R	12	12	84	30	1.5	90.30
2161-12-2.0R	12	12	84	30	2.0	90.30
2161-12-2.5R	12	12	84	30	2.5	90.30
2161-12-3.0R	12	12	84	30	3.0	90.30
2161-16-0.25R	16	16	90	35	0.25	146.54
2161-16-0.5R	16	16	90	35	0.5	146.54
2161-16-0.75R	16	16	90	35	0.75	149.54
2161-16-1.0R	16	16	90	35	1.0	149.54
2161-16-1.5R	16	16	90	35	1.5	149.54
2161-16-2.0R	16	16	90	35	2.0	149.54
2161-16-2.5R	16	16	90	35	2.5	149.54
2161-16-3.0R	16	16	90	35	3.0	149.54
2161-16-4.0R	16	16	90	35	4.0	149.54
2161-20-0.25R	20	20	100	40	0.25	191.53
2161-20-0.5R	20	20	100	40	0.5	191.53
2161-20-0.75R	20	20	100	40	0.75	194.64
2161-20-1.0R	20	20	100	40	1.0	194.64
2161-20-1.5R	20	20	100	40	1.5	194.64
2161-20-2.0R	20	20	100	40	2.0	194.64
2161-20-2.5R	20	20	100	40	2.5	194.64
2161-20-3.0R	20	20	100	40	3.0	194.64
2161-20-4.0R	20	20	100	40	4.0	194.64

For Speeds & Feeds please see page 46.

NEW

3091 Series

3 Flute Long Reach End Mills For Aluminium



Description

3 flute solid carbide square end straight shank, right hand helix, centre cutting, long series, short flute. Manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed to give extremely high performance in the machining of Aluminium and other non-ferrous materials. The radical flute geometry gives exceptional swarf clearance and excellent surface finish at high feed rates whilst the long reach and short length of cut gives maximum rigidity. In addition, the 3 centre cutting end teeth enable excellent plunging and ramping capabilities.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	NECK DIAMETER	PRICE £
3091-3	3	6	75	4.5	12	2.5	67.40
3091-4	4	6	75	6	15	3.5	67.40
3091-5	5	6	75	7.5	20	4.5	67.40
3091-6	6	6	100	9	20	5	82.50
3091-8	8	8	100	12	25	7	85.80
3091-10	10	10	100	15	32	9	106.95
3091-12	12	12	100	18	40	11	111.10
3091-16	16	16	150	24	50	14	197.20
3091-20	20	20	150	30	65	18	272.80

For Speeds & Feeds please see page 46.

NEW

3091 Series

3 Flute Long Reach End Mills For Aluminium with Radius



Description

3 flute solid carbide square end straight shank, right hand helix, centre cutting, long series, short flute. Manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed to give extremely high performance in the machining of Aluminium and other non-ferrous materials. The radical flute geometry gives exceptional swarf clearance and excellent surface finish at high feed rates whilst the long reach and short length of cut gives maximum rigidity. In addition, the 3 centre cutting end teeth enable excellent plunging and ramping capabilities.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	NECK DIAMETER	RADIUS	PRICE £
3091-3-0.25R	3	6	75	4.5	12	2.5	0.25	85.90
3091-3-0.5R	3	6	75	4.5	12	2.5	0.5	85.90
3091-3-0.75R	3	6	75	4.5	12	2.5	0.75	85.90
3091-3-1.0R	3	6	75	4.5	12	2.5	1.0	85.90
3091-4-0.25R	4	6	75	6	15	3.5	0.25	85.90
3091-4-0.5R	4	6	75	6	15	3.5	0.5	85.90
3091-4-0.75R	4	6	75	6	15	3.5	0.75	85.90
3091-4-1.0R	4	6	75	6	15	3.5	1.0	85.90
3091-5-0.25R	5	6	75	7.5	20	4.5	0.25	85.90
3091-5-0.5R	5	6	75	7.5	20	4.5	0.5	85.90
3091-5-0.75R	5	6	75	7.5	20	4.5	0.75	85.90
3091-5-1.0R	5	6	75	7.5	20	4.5	1.0	85.90
3091-6-0.25R	6	6	100	9	20	5	0.25	101.00
3091-6-0.5R	6	6	100	9	20	5	0.5	101.00
3091-6-0.75R	6	6	100	9	20	5	0.75	101.00
3091-6-1.0R	6	6	100	9	20	5	1.0	101.00
3091-6-1.5R	6	6	100	9	20	5	1.5	101.00
3091-6-2.0R	6	6	100	9	20	5	2.0	101.00
3091-8-0.25R	8	8	100	12	25	7	0.25	110.00
3091-8-0.5R	8	8	100	12	25	7	0.5	110.00
3091-8-0.75R	8	8	100	12	25	7	0.75	104.30
3091-8-1.0R	8	8	100	12	25	7	1.0	104.30
3091-8-1.5R	8	8	100	12	25	7	1.5	104.30
3091-8-2.0R	8	8	100	12	25	7	2.0	113.30
3091-10-0.25R	10	10	100	15	32	9	0.25	113.30
3091-10-0.5R	10	10	100	15	32	9	0.5	125.45
3091-10-0.75R	10	10	100	15	32	9	0.75	125.45
3091-10-1.0R	10	10	100	15	32	9	1.0	125.45

For Speeds & Feeds please see page 46.

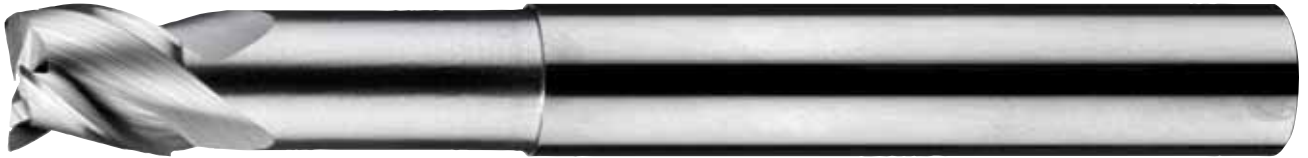
3091 Series

Continued

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	NECK DIAMETER	RADIUS	PRICE £
3091-10-1.5R	10	10	100	15	32	9	1.5	134.45
3091-10-2.0R	10	10	100	15	32	9	2.0	134.45
3091-12-0.25R	12	12	100	18	40	11	0.25	129.60
3091-12-0.5R	12	12	100	18	40	11	0.5	129.60
3091-12-0.75R	12	12	100	18	40	11	0.75	129.60
3091-12-1.0R	12	12	100	18	40	11	1.0	129.60
3091-12-1.5R	12	12	100	18	40	11	1.5	138.60
3091-12-2.0R	12	12	100	18	40	11	2.0	138.60
3091-16-0.25R	16	16	150	24	50	14	0.25	215.70
3091-16-0.5R	16	16	150	24	50	14	0.5	215.70
3091-16-0.75R	16	16	150	24	50	14	0.75	215.70
3091-16-1.0R	16	16	150	24	50	14	1.0	215.70
3091-16-1.5R	16	16	150	24	50	14	1.5	224.70
3091-16-2.0R	16	16	150	24	50	14	2.0	224.70
3091-16-3.0R	16	16	150	24	50	14	3.0	237.20
3091-16-4.0R	16	16	150	24	50	14	4.0	237.20
3091-16-5.0R	16	16	150	24	50	14	5.0	237.20
3091-20-0.25R	20	20	150	30	65	18	0.25	291.30
3091-20-0.5R	20	20	150	30	65	18	0.5	291.30
3091-20-0.75R	20	20	150	30	65	18	0.75	291.30
3091-20-1.0R	20	20	150	30	65	18	1.0	291.30
3091-20-1.5R	20	20	150	30	65	18	1.5	299.30
3091-20-2.0R	20	20	150	30	65	18	2.0	299.30
3091-20-3.0R	20	20	150	30	65	18	3.0	311.80
3091-20-4.0R	20	20	150	30	65	18	4.0	311.80
3091-20-5.0R	20	20	150	30	65	18	5.0	311.80

3001 Series

3 Flute Long Reach End Mills For Aluminium



Description

3 flute solid carbide square end straight shank, 40° right hand helix, centre cutting, long series, short flute. Manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed for the machining of Aluminium on machines with medium to high spindle speeds. The long reach and short length of cut gives maximum rigidity, whilst “Wipers” on the teeth ends give exceptional surface finish. These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively we can make complete to your specification.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	NECK DIAMETER	PRICE £
3001-6	6	6	100	6	20	5	80.95
3001-8	8	8	100	8	25	7	84.15
3001-10	10	10	100	10	25	9	100.14
3001-12	12	12	100	12	40	11	104.02
3001-16	16	16	125	16	50	14	137.90
3001-20	20	20	150	20	65	18	256.41
3001-25	25	25	150	25	65	23	497.40

N.B. Other sizes and corner radius available on request.

For Speeds & Feeds please see page 46.

NEW

3201 Series

3 Flute Long Length End Mill For Aluminium



Description

3 flute, long series, solid carbide, square end, straight shank, right hand helix, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed to give extremely high performance in the machining of Aluminium and other non-ferrous materials. The radical flute geometry gives exceptional swarf clearance and excellent surface finish at high feed rates.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
3201-3	3	6	75	15	39.42
3201-4	4	6	75	20	41.60
3201-5	5	6	75	25	48.57
3201-6	6	6	100	35	51.79
3201-8	8	8	100	45	65.52
3201-10	10	10	100	45	70.10
3201-12	12	12	100	50	100.78
3201-16	16	16	150	60	194.48
3201-20	20	20	150	80	247.52

For Speeds & Feeds please see page 46.

3051 Series

3 Flute Long Length End Mill For Aluminium



Description

3 flute solid carbide, single end, long length, square end, straight shank, 55° right hand helix, right hand cut, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed to give similar performance benefits to the 3041 series in applications requiring extended flute length.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
3051-2	2	6	75	10	36.75
3051-3	3	6	75	15	36.75
3051-4	4	6	75	20	38.92
3051-5	5	6	75	25	45.35
3051-6	6	6	100	35	48.36
3051-8	8	8	100	45	61.21
3051-10	10	10	100	45	65.58
3051-12	12	12	100	50	94.14
3051-14	14	14	100	50	132.11
3051-16	16	16	150	60	181.70
3051-18	18	18	150	60	218.03
3051-20	20	20	150	80	231.54
3051-25	25	25	150	80	448.86

For Speeds & Feeds please see page 46.

NEW

3051 Series

3 Flute Long Length End Mill For Aluminium with Radius

Description

3 flute solid carbide, single end, long length, square end, straight shank, 55° right hand helix, right hand cut, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed to give similar performance benefits to the 3041 series in applications requiring extended flute length.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £	CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £
3051-3-0.25R	3	6	75	15	0.25	55.25	3051-10-1.0R	10	10	100	45	1.0	84.08
3051-3-0.5R	3	6	75	15	0.5	55.25	3051-10-1.5R	10	10	100	45	1.5	93.08
3051-3-0.75R	3	6	75	15	0.75	55.25	3051-10-2.0R	10	10	100	45	2.0	93.08
3051-3-1.0R	3	6	75	15	1.0	55.25	3051-12-0.25R	12	12	100	50	0.25	112.64
3051-4-0.25R	4	6	75	20	0.25	57.42	3051-12-0.5R	12	12	100	50	0.5	112.64
3051-4-0.5	4	6	75	20	0.5	57.42	3051-12-0.75R	12	12	100	50	0.75	112.64
3051-4-0.75	4	6	75	20	0.75	57.42	3051-12-1.0R	12	12	100	50	1.0	112.64
3051-4-1.0	4	6	75	20	1.0	57.42	3051-12-1.5R	12	12	100	50	1.5	121.64
3051-5-0.25R	5	6	75	25	0.25	63.85	3051-12-2.0R	12	12	100	50	2.0	121.64
3051-5-0.5R	5	6	75	25	0.5	63.85	3051-16-0.25R	16	16	150	60	0.25	200.20
3051-5-0.75R	5	6	75	25	0.75	63.85	3051-16-0.5R	16	16	150	60	0.5	200.20
3051-5-1.0R	5	6	75	25	1.0	63.85	3051-16-0.75R	16	16	150	60	0.75	200.20
3051-6-0.25R	6	6	100	35	0.25	66.86	3051-16-1.0R	16	16	150	60	1.0	200.20
3051-6-0.5R	6	6	100	35	0.5	66.86	3051-16-1.5R	16	16	150	60	1.5	209.20
3051-6-0.75R	6	6	100	35	0.75	66.86	3051-16-2.0R	16	16	150	60	2.0	209.20
3051-6-1.0R	6	6	100	35	1.0	66.86	3051-16-3.0R	16	16	150	60	3.0	221.70
3051-6-1.5R	6	6	100	35	1.5	75.86	3051-16-4.0R	16	16	150	60	4.0	221.70
3051-6-2.0R	6	6	100	35	2.0	75.86	3051-16-5.0R	16	16	150	60	5.0	221.70
3051-8-0.25R	8	8	100	45	0.25	79.71	3051-20-0.25R	20	20	150	80	0.25	250.04
3051-8-0.5R	8	8	100	45	0.5	79.71	3051-20-0.5R	20	20	150	80	0.5	250.04
3051-8-0.75R	8	8	100	45	0.75	79.71	3051-20-0.75R	20	20	150	80	0.75	250.04
3051-8-1.0R	8	8	100	45	1.0	79.71	3051-20-1.0R	20	20	150	80	1.0	250.04
3051-8-1.5R	8	8	100	45	1.5	88.71	3051-20-1.5R	20	20	150	80	1.5	259.04
3051-8-2.0R	8	8	100	45	2.0	88.71	3051-20-2.0R	20	20	150	80	2.0	259.04
3051-10-0.25R	10	10	100	45	0.25	84.08	3051-20-3.0R	20	20	150	80	3.0	271.54
3051-10-0.5R	10	10	100	45	0.5	84.08	3051-20-4.0R	20	20	150	80	4.0	271.54
3051-10-0.75R	10	10	100	45	0.75	84.08	3051-20-5.0R	20	20	150	80	5.0	271.54

For Speeds & Feeds please see page 46.

3041 Series

3 Flute End Mill For Aluminium



Description

3 flute solid carbide, single end, standard length, square end, straight shank, 55° right hand helix, right hand cut, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed to give extremely high performance in the machining of aluminium and other soft non-ferrous materials. Special flute geometry gives excellent swarf clearance, whilst the circular land and end teeth "Wipers" give exceptional surface finish. This tool is similar to but slightly more rigid than the 2041 series 2 flute.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
3041-3	3	3	38	12	24.32
3041-4	4	4	50	15	25.28
3041-5	5	5	50	20	25.82
3041-6	6	6	64	20	26.36
3041-8	8	8	64	22	39.75
3041-10	10	10	70	27	54.51
3041-12	12	12	76	27	73.08
3041-14	14	14	90	30	110.92
3041-16	16	16	90	35	127.73
3041-18	18	18	90	35	157.10
3041-20	20	20	100	40	166.26

For Speeds & Feeds please see page 46.

3041 Series

3 Flute End Mill For Aluminium With Radius



Description

3 flute solid carbide, single end, standard length, square end, straight shank, 55° right hand helix, right hand cut, centre cutting.

Application

Designed to give extremely high performance in the machining of aluminium and other soft non-ferrous materials. Special flute geometry gives excellent swarf clearance, whilst the circular land give exceptional surface finish. This tool is similar to but slightly more rigid than the 2041 series 2 flute.

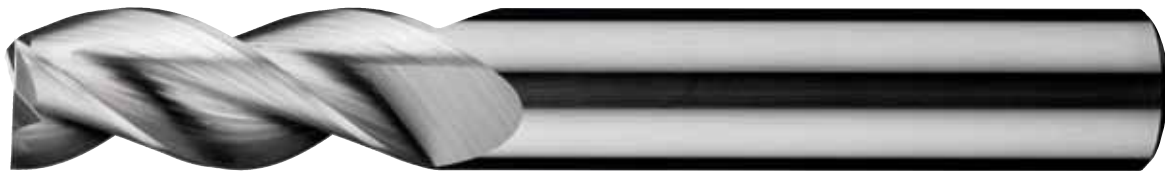
Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £
3041-3-0.5R	3	3	38	12	0.5	32.51
3041-3-1.0R	3	3	38	12	1.0	42.76
3041-4-0.5R	4	4	50	15	0.5	37.68
3041-4-1.0R	4	4	50	15	1.0	47.82
3041-5-0.5R	5	5	50	20	0.5	39.14
3041-5-1.0R	5	5	50	20	1.0	48.35
3041-6-0.5R	6	6	64	20	0.5	39.35
3041-6-1.0R	6	6	64	20	1.0	49.45
3041-8-0.5R	8	8	64	22	0.5	50.81
3041-8-1.0R	8	8	64	22	1.0	53.82
3041-8-1.5R	8	8	64	22	1.5	53.82
3041-10-0.5R	10	10	70	27	0.5	61.73
3041-10-1.0R	10	10	70	27	1.0	66.11
3041-10-1.5R	10	10	70	27	1.5	66.11
3041-10-2.0R	10	10	70	27	2.0	66.11
3041-12-0.5R	12	12	76	27	0.5	80.20
3041-12-1.0R	12	12	76	27	1.0	81.83
3041-12-1.5R	12	12	76	27	1.5	81.83
3041-12-2.0R	12	12	76	27	2.0	81.83
3041-16-0.5R	16	16	90	35	0.5	133.04
3041-16-1.0R	16	16	90	35	1.0	135.50
3041-16-1.5R	16	16	90	35	1.5	135.50
3041-16-2.0R	16	16	90	35	2.0	135.50
3041-20-0.5R	20	20	100	40	0.5	173.76
3041-20-1.0R	20	20	100	40	1.0	176.62
3041-20-1.5R	20	20	100	40	1.5	176.62
3041-20-2.0R	20	20	100	40	2.0	176.62

N.B. Other sizes and radii available on request. For Speeds & Feeds please see page 46.

3081 Series

3 Flute End Mill For Aluminium



Description

3 flute, solid carbide, square end, straight shank, right hand helix, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide. Available uncoated and DLC coated.

Application

Designed to give extremely high performance in the machining of Aluminium and other non-ferrous materials. The radical flute geometry gives exceptional swarf clearance and excellent surface finish at high feed rates.

Metric Sizes (mm)

UNCOATED CATALOGUE No.	COATED CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE UNCOATED £	PRICE COATED £
3081-3	3081-3G	3	3	40	12	26.78	36.86
3081-4	3081-4G	4	4	50	15	27.85	37.93
3081-5	3081-5G	5	5	50	20	28.49	39.26
3081-6	3081-6G	6	6	64	20	29.03	39.80
3081-8	3081-8G	8	8	64	22	43.81	57.37
3081-10	3081-10G	10	10	70	27	59.13	75.39
3081-12	3081-12G	12	12	84	30	80.45	105.62
3081-16	3081-16G	16	16	90	35	140.54	168.65
3081-20	3081-20G	20	20	100	40	183.18	219.57

For Speeds & Feeds please see page 46.

3081 Series

3 Flute End Mill For Aluminium With Radius

Description

3 flute, solid carbide, square end, straight shank, right hand helix, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide.



Application

Designed to give extremely high performance in the machining of Aluminium and other non-ferrous materials. The radical flute geometry gives exceptional swarf clearance and excellent surface finish at high feed rates.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £
3081-3-0.25R	3	3	38	12	0.25	35.78
3081-3-0.5R	3	3	38	12	0.5	35.78
3081-3-0.75R	3	3	38	12	0.75	35.78
3081-3-1.0R	3	3	38	12	1.0	47.03
3081-4-0.25R	4	4	50	15	0.25	41.46
3081-4-0.5R	4	4	50	15	0.5	41.46
3081-4-0.75R	4	4	50	15	0.75	41.46
3081-4-1.0R	4	4	50	15	1.0	52.70
3081-5-0.25R	5	5	50	20	0.25	43.06
3081-5-0.5R	5	5	50	20	0.5	43.06
3081-5-0.75R	5	5	50	20	0.75	43.06
3081-5-1.0R	5	5	50	20	1.0	54.42
3081-6-0.25R	6	6	64	20	0.25	43.38
3081-6-0.5R	6	6	64	20	0.5	43.38
3081-6-0.75R	6	6	64	20	0.75	43.38
3081-6-1.0R	6	6	64	20	1.0	54.52
3081-6-1.5R	6	6	64	20	1.5	54.52
3081-6-2.0R	6	6	64	20	2.0	54.52
3081-8-0.25R	8	8	64	22	0.25	55.92
3081-8-0.5R	8	8	64	22	0.5	55.92
3081-8-0.75R	8	8	64	22	0.75	55.92
3081-8-1.0R	8	8	64	22	1.0	59.77
3081-8-1.5R	8	8	64	22	1.5	59.77
3081-8-2.0R	8	8	64	22	2.0	59.77
3081-8-2.5R	8	8	64	22	2.5	59.77
3081-8-3.0R	8	8	64	22	3.0	59.77
3081-10-0.25R	10	10	70	27	0.25	68.02
3081-10-0.5R	10	10	70	27	0.5	68.02
3081-10-0.75R	10	10	70	27	0.75	68.02
3081-10-1.0R	10	10	70	27	1.0	72.73
3081-10-1.5R	10	10	70	27	1.5	72.73

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £
3081-10-2.0R	10	10	70	27	2.0	72.73
3081-10-2.5R	10	10	70	27	2.5	72.73
3081-10-3.0R	10	10	70	27	3.0	72.73
3081-12-0.25R	12	12	84	30	0.25	88.37
3081-12-0.5R	12	12	84	30	0.5	88.37
3081-12-0.75R	12	12	84	30	0.75	88.37
3081-12-1.0R	12	12	84	30	1.0	90.30
3081-12-1.5R	12	12	84	30	1.5	90.30
3081-12-2.0R	12	12	84	30	2.0	90.30
3081-12-2.5R	12	12	84	30	2.5	90.30
3081-12-3.0R	12	12	84	30	3.0	90.30
3081-16-0.25R	16	16	90	35	0.25	146.54
3081-16-0.5R	16	16	90	35	0.5	146.54
3081-16-0.75R	16	16	90	35	0.75	146.54
3081-16-1.0R	16	16	90	35	1.0	149.54
3081-16-1.5R	16	16	90	35	1.5	149.54
3081-16-2.0R	16	16	90	35	2.0	149.54
3081-16-2.5R	16	16	90	35	2.5	149.54
3081-16-3.0R	16	16	90	35	3.0	149.54
3081-16-4.0R	16	16	90	35	4.0	149.54
3081-20-0.25R	20	20	100	40	0.25	191.53
3081-20-0.5R	20	20	100	40	0.5	191.53
3081-20-0.75R	20	20	100	40	0.75	191.53
3081-20-1.0R	20	20	100	40	1.0	191.53
3081-20-1.5R	20	20	100	40	1.5	191.53
3081-20-2.0R	20	20	100	40	2.0	191.53
3081-20-2.5R	20	20	100	40	2.5	191.53
3081-20-3.0R	20	20	100	40	3.0	191.53
3081-20-4.0R	20	20	100	40	4.0	191.53

5011 Series

Multi-Flute End Mill For Aluminium



Description

Multi-Flute carbide end mill, fast helix, square end, straight shank, manufactured from Ultra Wear Resistant Micrograin Carbide. Available both uncoated and ALTiN coated.

Application

Designed for semi-roughing and finishing of Aluminium and similar materials. The fast helix and specially developed geometry result in extremely good surface finish, together with an exceptionally high metal removal rate.

Metric Sizes (mm)

CATALOGUE No. Uncoated	CATALOGUE No. Coated	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE UNCOATED £	PRICE COATED £
5011-3	5011-3C	3	3	40	12	27.04	39.55
5011-4	5011-4C	4	4	50	15	31.95	50.28
5011-5	5011-5C	5	5	50	20	35.65	53.96
5011-6	5011-6C	6	6	64	20	43.04	61.34
5011-8	5011-8C	8	8	64	22	53.13	76.91
5011-10	5011-10C	10	10	70	27	68.16	94.53
5011-12	5011-12C	12	12	76	27	82.38	111.74
5011-16	5011-16C	16	16	90	35	148.78	196.99
5011-20	5011-20C	20	20	100	40	206.83	283.74

For Speeds & Feeds please see page 46.

2082 Series

2 Flute Long Ball Nose End Mill For Aluminium - Reduced Shank



Description

2 flute solid carbide, straight shank reduced from cutter diameter, single end, long length short flute, ball nose, 50° right hand helix, right hand cut, centre cutting. Manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed for the efficient machining of Aluminium on machines with medium to high spindle speeds. The long reach short length of cut combination gives maximum rigidity, whilst the specially developed geometry delivers optimum performance. The 2082 is uniquely flexible due to the reduced shank diameter, enabling the tool to be used on both shallow and deep pocket applications without modifications. These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively we can make complete to your specification.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
2082-6	6	5	100	6	86.33
2082-8	8	7	100	8	89.34
2082-10	10	9	100	10	104.65
2082-12	12	11	100	12	114.62
2082-14	14	12	125	14	177.32
2082-16	16	14	125	16	213.79
2082-20	20	18	150	20	307.91

For Speeds & Feeds please see page 46.

2142 Series

2 Flute XLS Ball Nose End Mill For Aluminium



Description

2 flute solid carbide ball nose, straight shank, 50° right hand helix, centre cutting, short flute, extra long overall length, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed for the machining of Aluminium on machines with medium to high spindle speeds. The extra long overall length enables machining of deep applications with a short length of cut for maximum rigidity, whilst the specially developed end geometry delivers optimum performance under demanding conditions. These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively we can make complete to your specification.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	NECK DIAMETER	PRICE £
2142-6	6	6	150	8	20	5	95.41
2142-8	8	8	150	10	25	7	103.05
2142-10	10	10	150	12	25	9	121.20
2142-12	12	12	150	16	40	11	139.73
2142-16	16	16	200	20	50	14	310.36
2142-20	20	20	200	25	65	18	434.37

For Speeds & Feeds please see page 46.

2022 Series

2 Flute Long Series Ball Nose End Mill For Aluminium



Description

2 flute solid carbide, ball nose, straight shank, 50° right hand helix, centre cutting, long series, short flute. Manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed for the efficient machining of Aluminium on machines with medium to high spindle speeds. The long reach and short length of cut gives maximum rigidity, whilst the specially developed end geometry delivers optimum performance under demanding conditions. These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively we can make complete to your specification.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	NECK DIAMETER	PRICE £
2022-2	2	6	75	4	8	1.8	40.83
2022-3	3	6	75	5	9	2.7	40.83
2022-4	4	6	75	6	15	3.6	40.83
2022-5	5	6	75	8	18	4.5	40.83
2022-6	6	6	100	10	20	5.0	51.50
2022-8	8	8	100	12	25	7.0	63.84
2022-10	10	10	100	14	30	9.0	87.78
2022-12	12	12	100	16	40	11.0	109.11
2022-14	14	14	100	18	45	13.0	247.39
2022-16	16	16	125	20	50	14.0	284.62
2022-20	20	20	150	25	65	18.0	372.47

For Speeds & Feeds please see page 46.

NEW

2172 Series

2 Flute Ball Nose End Mill For Aluminium



Description

2 flute, solid carbide, ball nose, straight shank, right hand helix, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed to give improved performance in the machining of Aluminium and other non-ferrous materials. Radical flute geometry gives exceptional swarf clearance and excellent surface finish at high feed rates.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
2172-3	3	3	40	12	31.50
2172-4	4	4	50	15	34.10
2172-5	5	5	50	20	35.80
2172-6	6	6	64	20	43.60
2172-8	8	8	64	22	50.50
2172-10	10	10	70	25	74.40
2172-12	12	12	84	30	113.70
2172-16	16	16	90	35	175.40
2172-20	20	20	100	40	288.90

For Speeds & Feeds please see page 46.

2052 Series

2 Flute Ball Nose End Mill For Aluminium



Description

2 flute solid carbide, ball nose, straight shank, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed for the efficient machining of aluminium on machines with medium to high spindle speeds. The specially developed geometry delivers optimum performance and excellent surface finish under demanding conditions. These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively we can make complete to your specifications.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
2052-3	3	3	38	12	29.50
2052-4	4	4	50	15	31.95
2052-5	5	5	50	20	33.54
2052-6	6	6	64	20	40.83
2052-8	8	8	64	22	47.34
2052-10	10	10	70	27	69.68
2052-12	12	12	76	27	106.42
2052-14	14	14	90	30	151.22
2052-16	16	16	90	35	164.20
2052-20	20	20	100	40	270.48

For Speeds & Feeds please see page 46.

180-10 Series

Single Flute End Mill For Aluminium & Plastics



Description

Solid carbide single flute, square end, straight shank, 45° right hand helix, centre cutting. Manufactured from Ultra Wear Resistant Micrograin Carbide to extremely tight tolerances, with exceptional surface finish.

Application

Designed for use on both aluminium, acrylics and other soft non-ferrous materials. The single flute design gives excellent swarf clearance, combined with a short cutting length for strength.

Polished surfaces give improved surface finish on the component.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
180-0394-10	1	3	38	3	37.81
180-0591-10	1.5	3	38	4	37.81
180-0984-10	2.5	3	38	7	31.86
180-1181-10	3	3	38	8	28.07
180-1575-10	4	4	50	11	33.53
180-1969-10	5	5	50	13	36.87
180-2362-10	6	6	57	13	43.89
180-3150-10	8	8	63	19	67.50
180-3937-10	10	10	72	22	82.42
180-4724-10	12	12	83	26	96.48

For Speeds & Feeds please see page 46.

180-10-A Series

Single Flute End Mill For Aluminium & Plastics - Reinforced Shank



Description

A single flute, spiral 30° helix on reinforced shank, ideal for reducing number of collet changes, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Offers exceptional surface finish on aluminium, acrylic and PVC.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
180-0787-10-A	2	6	40	7	38.70
180-0984-10-A	2.5	6	40	8	38.70
180-1181-10-A-XL	3	6	50	10	35.99
180-1378-10-A	3.5	6	40	10	35.99
180-1575-10-A	4	6	40	10	35.99
180-1969-10-A	5	6	50	12	35.99
180-2165-10-A	5.5	6	50	14	35.99

For Speeds & Feeds please see page 46.

180-10-ST Series

Single Flute Stub End Mill For Aluminium & Plastics



Description

Solid carbide single flute, square end, straight shank, 45° helix, stub length, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Offers exceptional surface finish on aluminium, acrylic and PVC. Stub length gives increased rigidity.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
180-1181-10-ST	3	3	38	5	24.52
180-1575-10-ST	4	4	50	6	28.07
180-1969-10-ST	5	5	50	7	33.74
180-2362-10-ST	6	6	50	8	40.21

For Speeds & Feeds please see page 46.

180-10-LG Series

Long Series Single Flute End Mill For Aluminium & Plastics



Description

Solid carbide single flute, square end, straight shank, 30° right hand helix, centre cutting. Manufactured from Ultra Wear Resistant Micrograin Carbide, to extremely tight tolerances with exceptional surface finish. Also available in left hand helix.

Application

Offers exceptional surface finish on aluminium, acrylic and PVC.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
180-0787-10-LG	2	3	38	10	35.02
180-1181-10-LG	3	3	38	10	25.37
180-1575-10-LG	4	4	50	14	26.67
180-1969-10-LG	5	5	60	16	32.40
180-2362-10-LG	6	6	58	20	37.37
180-3150-10-LG	8	8	100	30	70.98
180-3937-10-LG	10	10	100	40	88.76
180-4724-10-LG	12	12	100	50	101.39

For Speeds & Feeds please see page 46.

180-10-STA Series

Single Flute Stub End Mill For Aluminium & Plastics



Description

Solid carbide single flute, square end, straight shank, 30° right hand helix, centre cutting. Manufactured from Ultra Wear Resistant Micrograin Carbide to extremely tight tolerances, with exceptional surface finish. Short overall length combined with useful longer cut length, offer a very robust cutter for most applications.

Application

Designed for use on both aluminium, acrylics and other soft non-ferrous materials. The single flute design gives excellent swarf clearance, combined with a short cutting length for strength. Polished surfaces give improved surface finish on the component.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
180-0787-10-STA	2	3	30	7	35.02
180-1181-10-STA	3	3	30	8	25.37
180-1575-10-STA	4	4	50	10	26.67
180-2362-10-STA	6	6	50	14	37.37

For Speeds & Feeds please see page 46.

180-12 Series

2 Flute Straight Router



Description

2 flute, solid carbide, single end, standard length, straight shank, straight flute, right hand cut, plunge style end cut.

Application

The straight 2 flute router is widely used on materials such as plexiglass and perspex. The straight flute router is preferred in applications where the work piece is fairly rigid. 2 flutes provide the maximum swarf clearance.

Imperial Sizes (inches)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
180-3411-20	1/8	1/8	1-1/2	1/2	16.22
180-4551-20	3/16	3/16	2	5/8	23.38
180-5551-20	1/4	1/4	2-1/2	3/4	43.23
180-6251-20	5/16	5/16	2-1/2	13/16	44.14
180-6801-20	3/8	3/8	2-1/2	7/8	53.76
180-7251-20	7/16	7/16	2-1/2	1	62.47
180-7451-20	1/2	1/2	3	1	80.35

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
180-1181-20	3	3	40	12	16.30
180-1575-20	4	4	50	16	22.23
180-1969-20	5	5	50	18	23.59
180-2362-20	6	6	58	20	43.22
180-3150-20	8	8	64	22	45.94
180-3937-20	10	10	70	25	56.43
180-4724-20	12	12	76	30	84.10

180-13 Series

3 Flute Straight Router



Description

3 flute, solid carbide, single end, standard length, straight shank, straight flute, right hand cut, plunge style end cut.

Application

The 3 straight flute router is an excellent tool for routing harder materials and also where a fine finish is required. The 3 flute design offers more strength than the 2 flute router.

Imperial Sizes (inches)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
180-3411-30	1/8	1/8	1-1/2	1/2	16.22
180-4551-30	3/16	3/16	2	5/8	23.38
180-5551-30	1/4	1/4	2-1/2	3/4	43.23
180-6251-30	5/16	5/16	2-1/2	13/16	44.14
180-6801-30	3/8	3/8	2-1/2	7/8	53.76
180-7251-30	7/16	7/16	2-1/2	1	62.47
180-7451-30	1/2	1/2	3	1	80.35

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
180-1181-30	3	3	40	12	16.30
180-1575-30	4	4	50	16	22.23
180-1969-30	5	5	50	18	23.59
180-2362-30	6	6	58	20	43.22
180-3150-30	8	8	64	22	45.94
180-3937-30	10	10	70	25	56.43
180-4724-30	12	12	76	30	84.10

180-62 Series

2 Flute Spiral Router



Description

2 flute, solid carbide, single end, standard length, straight shank, 30° left hand helix, right hand cut, plunge style end cut.

Application

The 2 flute left hand helix down cut router is an excellent tool for cutting materials that are flexible. The left hand helix directs the cutting force downwards holding the material rigid against the bottom template or support. Burrs on the top surface of the work piece are eliminated. Typically used on softer materials.

Imperial Sizes (inches)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
180-3416-20	1/8	1/8	1-1/2	1/2	16.22
180-4556-20	3/16	3/16	2	5/8	23.01
180-5556-20	1/4	1/4	2-1/2	3/4	43.23
180-6256-20	5/16	5/16	2-1/2	13/16	44.14
180-6806-20	3/8	3/8	2-1/2	7/8	53.76
180-7256-20	7/16	7/16	2-1/2	1	62.47
180-7456-20	1/2	1/2	3	1	80.35

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
180-1181-21	3	3	40	12	16.30
180-1575-21	4	4	50	16	22.23
180-1969-21	5	5	50	18	23.59
180-2362-21	6	6	58	20	43.22
180-3150-21	8	8	64	22	45.94
180-3937-21	10	10	70	25	56.43
180-4724-21	12	12	76	30	84.10

180-63 Series

3 Flute Spiral Router



Description

3 flute, solid carbide, single end, standard length, straight shank, 30° left hand helix, right hand cut, plunge style end cut.

Application

The 3 flute left hand helix down cut router is best suited for applications requiring good finishes. The left hand spiral combined with 3 flutes makes this router the best selection for free hand routing where smooth chatterless operation is required.

Imperial Sizes (inches)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
180-3416-30	1/8	1/8	1-1/2	1/2	16.22
180-4556-30	3/16	3/16	2	5/8	23.01
180-5556-30	1/4	1/4	2-1/2	3/4	43.23
180-6256-30	5/16	5/16	2-1/2	13/16	44.14
180-6806-30	3/8	3/8	2-1/2	7/8	53.76
180-7256-30	7/16	7/16	2-1/2	1	62.47
180-7456-30	1/2	1/2	3	1	80.35

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
180-1181-31	3	3	40	12	16.30
180-1575-31	4	4	50	16	22.23
180-1969-31	5	5	50	18	23.59
180-2362-31	6	6	58	20	43.22
180-3150-31	8	8	64	22	45.94
180-3937-31	10	10	70	25	56.43
180-4724-31	12	12	76	30	84.10

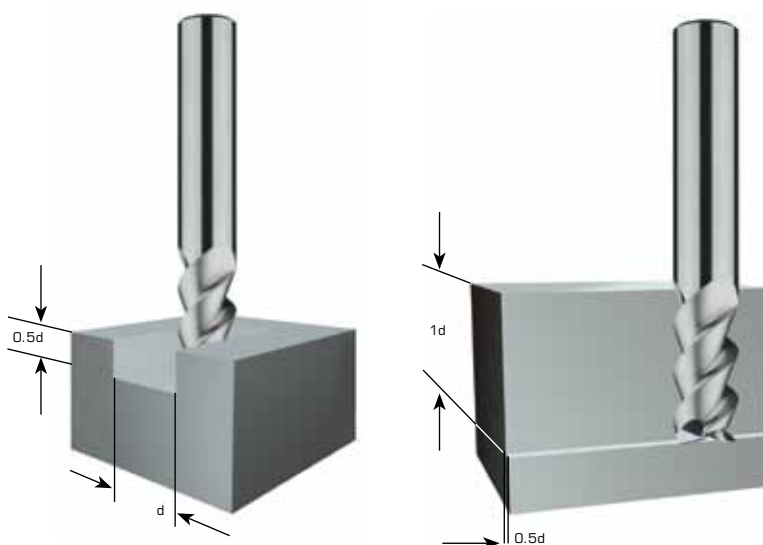
Cutting Data for Aluminium

180-10 / 2001 / 2001-H / 2022 / 2031 / 2041 / 2051 / 2052 / 2061 / 2081 / 2082 / 2131 / 2161 / 2201 / 3081 / 2142 / 3001 / 3041 / 3051 / 3091/2172 / 3201 Cyber Series

Full Width x 0.5D

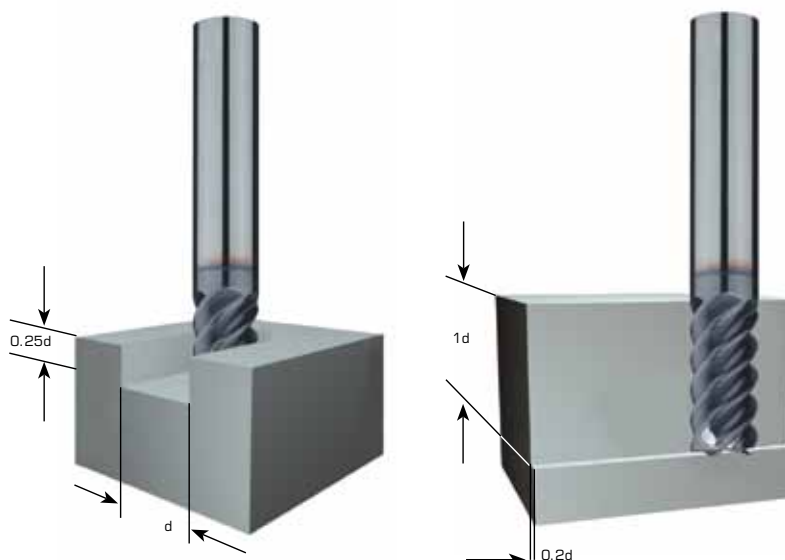
	SURFACE SPEED	FEED (mm/Tooth) END MILL DIAMETER								
MATERIAL GROUP	METRES/MIN	3mm	4mm	5mm	6mm	8mm	10mm	12mm	16mm	20mm
Aluminium Low <8% Silicon	300-600	0.03	0.04	0.05	0.06	0.08	0.10	0.15	0.16	0.20
Aluminium High >8% Silicon	200-400	0.02	0.03	0.04	0.05	0.06	0.08	0.12	0.13	0.16

Series 3051 Reduce Feed by 40%.



5011 Cyber Series
Full Width x 0.25D

	SURFACE SPEED	FEED (mm/Tooth) END MILL DIAMETER								
MATERIAL GROUP	METRES/MIN	3mm	4mm	5mm	6mm	8mm	10mm	12mm	16mm	20mm
Aluminium Low <8% Silicon	300-600	0.03	0.04	0.05	0.06	0.08	0.10	0.15	0.16	0.20
Aluminium High >8% Silicon	200-400	0.02	0.03	0.04	0.05	0.06	0.08	0.12	0.13	0.16



2002 Series / 2012 Series

2 Flute Ball Nose End Mills For Steel



Description

2 flute solid carbide ball nose end mill, short length of cut. Manufactured from Ultra Wear Resistant Micrograin Carbide, AlTiN coated.

Application

Designed for the profiling of Mould and Tool Steels up to 50 Rockwell C, Stainless Steel, Titanium, and Aerospace Alloys. Cyber Series end mills are especially suitable for High Speed Machining due to the short flute length which gives exceptional stability and accuracy. The specially developed geometry and coating results in excellent surface finish and extended tool life.

SHORT SERIES Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	PRICE £
2002-2D	2	6	53	4	8	56.97
2002-3D	3	6	55	5	9	56.97
2002-4D	4	6	55	6	13	56.97
2002-5D	5	6	55	7	15	56.97
2002-6D	6	6	58	8	-	55.68
2002-8D	8	8	64	10	-	77.96
2002-10D	10	10	72	12	-	104.60
2002-12D	12	12	84	16	-	125.65
2002-16D	16	16	92	20	-	228.97
2002-20D	20	20	105	25	-	354.00



LONG SERIES Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	PRICE £
2012-2D	2	6	75	4	8	60.37
2012-3D	3	6	75	5	9	60.37
2012-4D	4	6	75	6	15	60.37
2012-5D	5	6	75	7	18	60.37
2012-6D	6	6	100	8	-	73.68
2012-8D	8	8	100	10	-	93.13
2012-10D	10	10	100	12	-	128.00
2012-12D	12	12	100	16	-	159.04
2012-16D	16	16	125	20	-	415.00
2012-20D	20	20	150	25	-	543.08

For Speeds & Feeds please see page 65.

2152 Series

2 Flute Ball Nose End Mills For Hard Machining



Description

2 flute solid carbide, ball nose, straight shank, centre cutting, short length of cut. Manufactured from Ultra Wear Resistant Micrograin Carbide, Cupro coated.

Application

Designed to give outstanding performance when machining, steels hardened up to 65 Rockwell C. The short length of cut gives maximum rigidity, whilst the specially developed geometry coating delivers optimum performance under the most demanding conditions. These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively we can make complete to your specification.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	PRICE £
2152-1F	1	6	53	3	7	56.99
2152-2F	2	6	53	4	8	56.99
2152-3F	3	6	53	5	9	56.99
2152-4F	4	6	53	6	13	56.99
2152-5F	5	6	53	7	15	56.99
2152-6F	6	6	53	8	-	56.99
2152-8F	8	8	64	10	-	77.98
2152-10F	10	10	64	12	-	104.87
2152-12F	12	12	80	16	-	125.87
2152-16F	16	16	80	20	-	229.02
2152-20F	20	20	105	25	-	353.71

For Speeds & Feeds please see page 65.

2162 Series

2 Flute Long Length Ball Nose End Mills For Hard Machining



Description

2 flute solid carbide, ball nose, straight shank, centre cutting, short length of cut. Manufactured from Ultra Wear Resistant Micrograin Carbide, Cupro coated.

Application

Designed to give outstanding performance when machining, steels hardened up to 65 Rockwell C. The short length of cut gives maximum rigidity, whilst the specially developed geometry coating delivers optimum performance under the most demanding conditions. These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively we can make complete to your specification.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	PRICE £
2162-1F	1	6	75	3	7	61.06
2162-2F	2	6	75	4	8	61.06
2162-3F	3	6	75	5	9	61.06
2162-4F	4	6	75	6	15	61.06
2162-5F	5	6	75	7	18	61.06
2162-6F	6	6	100	8	-	73.70
2162-8F	8	8	100	10	-	93.19
2162-10F	10	10	100	12	-	128.01
2162-12F	12	12	100	16	-	159.18
2162-16F	16	16	150	20	-	415.30
2162-20F	20	20	150	25	-	536.67

For Speeds & Feeds please see page 65.

NEW

4032 Series

4 Flute Ball Nose for steel



Description

4 flute solid carbide, ball nose, straight shank, centre cutting, long series short length of cut.

Application

Designed to give superior performance in the machining of steel and other Ferrous materials. Long shank length gives maximum flexibility whilst short length of cut increases rigidity CUPRO coating adds extended tool life. Can be modified to your requirements.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
4032-2F	2	3	60	7	49.30
4032-3F	3	3	60	9	34.70
4032-4F	4	4	75	12	41.70
4032-5F	5	5	75	12	48.20
4032-6F	6	6	100	12	58.60
4032-8F	8	8	100	14	77.40
4032-10F	10	10	100	18	90.10
4032-12F	12	12	100	25	126.30

For Speeds & Feeds please see page 65.

4042 Series

4 Flute Ball Nose long reach series for steel

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	PRICE £
4042-2F	2	6	75	7	15	63.90
4042-3F	3	6	75	9	15	66.90
4042-4F	4	6	75	10	20	71.25
4042-5F	5	6	75	12	20	76.50

2112 Series

Micro Ball Nose End Mills For Steel



Description

2 flute solid carbide ball nosed end mill, centre cutting, reinforced shank, short flute, multiple neck lengths, manufactured from Ultra Wear Resistant Micrograin Carbide, AlTiN coated.

Application

Designed for use in the most demanding of applications, including the machining of hardened mould steels at high speeds and feeds. Multiple neck lengths in a variety of diameters gives excellent versatility, whilst the combination of extra-tough carbide, carefully developed geometry and specifically applied coating gives outstanding performance in difficult situations.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	NECK DIAMETER	PRICE £
2112-0.3-3D	0.3	4	50	0.3	3	0.28	65.02
2112-0.3-6D	0.3	4	50	0.3	6	0.28	65.02
2112-0.4-3D	0.4	4	50	0.4	3	0.38	62.11
2112-0.4-8D	0.4	4	50	0.4	8	0.38	62.11
2112-0.5-5D	0.5	4	50	0.5	5	0.48	62.11
2112-0.5-10D	0.5	4	50	0.5	10	0.48	62.11
2112-0.6-5D	0.6	4	50	0.6	5	0.58	62.11
2112-0.6-12D	0.6	4	50	0.6	12	0.58	62.11
2112-0.8-5D	0.8	4	50	0.8	5	0.78	56.17
2112-0.8-10D	0.8	4	50	0.8	10	0.78	56.17
2112-0.8-16D	0.8	4	50	0.8	16	0.78	56.17
2112-1.0-6D	1.0	6	57	1.0	6	0.95	58.28
2112-1.0-11D	1.0	6	57	1.0	11	0.95	58.28
2112-1.0-20D	1.0	6	57	1.0	20	0.95	58.28
2112-1.2-7D	1.2	6	57	1.2	7	1.15	58.28
2112-1.2-15D	1.2	6	57	1.2	15	1.15	58.28
2112-1.2-20D	1.2	6	57	1.2	20	1.15	58.28
2112-1.5-7D	1.5	6	57	1.5	7	1.45	58.28
2112-1.5-15D	1.5	6	57	1.5	15	1.45	58.28
2112-1.5-20D	1.5	6	57	1.5	20	1.45	58.28
2112-2.0-7D	2.0	6	57	2.0	7	1.90	58.28
2112-2.0-15D	2.0	6	57	2.0	15	1.90	58.28
2112-2.0-20D	2.0	6	57	2.0	20	1.90	58.28
2112-3.0-12D	3.0	6	57	3.0	12	2.90	62.90
2112-3.0-15D	3.0	6	57	3.0	15	2.90	62.90
2112-3.0-20D	3.0	6	57	3.0	20	2.90	62.90
2112-4.0-15D	4.0	6	57	4.0	15	3.80	62.90
2112-4.0-20D	4.0	6	57	4.0	20	3.80	62.90
2112-5.0-15D	5.0	6	57	5.0	15	4.80	62.90
2112-5.0-20D	5.0	6	57	5.0	20	4.80	62.90

For Speeds & Feeds please see page 65.

4101 Series

4 Flute Ball Nose End Mill



Description

4 Flute solid carbide, 30° right hand helix, 220° ball nose end mill, manufactured from Ultra Wear Resistant Micrograin Carbide, AlTiN coated.

Application

Designed with a reduced neck diameter for copy milling and deep pocket applications. The special ball geometry allows a tool inclination of up to 15° for increased feed rates and improved surface finish, whilst the AlTiN coating extends tool life.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH L2	REACH L3	NECK DIAMETER	PRICE £
4101-2-30D	2	6	75	1.3	30	6	1.3	125.66
4101-2-36D	2	6	75	1.3	36	10	1.3	125.66
4101-2-42D	2	6	75	1.3	42	16	1.3	125.66
4101-3-30D	3	6	75	2.0	30	9	2.0	125.66
4101-3-36D	3	6	75	2.0	36	15	2.0	125.66
4101-3-42D	3	6	75	2.0	42	21	2.0	125.66
4101-4-30D	4	6	75	2.7	30	12	2.7	125.66
4101-4-36D	4	6	75	2.7	36	20	2.7	125.66
4101-4-42D	4	6	100	2.7	42	32	2.7	125.66
4101-6-28D	6	6	75	4.0	28	18	4.0	125.66
4101-6-40D	6	6	75	4.0	40	25	4.0	125.66
4101-6-44D	6	6	100	4.0	44	32	4.0	125.66
4101-8-38D	8	8	100	5.4	38	24	5.4	165.11
4101-8-54D	8	8	100	5.4	54	40	5.4	165.11
4101-8-68D	8	8	100	5.4	68	55	5.4	165.11
4101-10-48D	10	10	100	6.7	48	30	6.7	206.93
4101-10-58D	10	10	100	6.7	58	40	6.7	206.93
4101-10-68D	10	10	100	6.7	68	55	6.7	206.93
4101-12-58D	12	12	100	8.0	58	36	8.0	256.47
4101-12-68D	12	12	100	8.0	68	55	8.0	256.47
4101-16-54D	16	16	100	10.7	54	48	10.7	295.10
4101-16-68D	16	16	100	10.7	68	55	10.7	295.10

For Speeds & Feeds please see page 65.

5021 Series

5 Flute Harmonic End Mill



Description

5 flute, solid carbide, long length, square end, straight shank, right hand helix, right hand cut, centre cutting, unequal flute spacing, with or without corner radius, Cupro Coated.

Application

Designed to give extremely high performance in the machining of steels and other tough materials including Aerospace Alloys. The radical flute geometry gives excellent removal rates and exceptional stability, whilst the flute spacing reduces machining noise by eliminating the harmonic effect.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £	CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £
5021-3F	3	6	58	9	-	47.56	5021-10F-3.0R	10	10	100	25	3.0	119.01
5021-3F-0.25R	3	6	58	9	0.25	65.34	5021-12F	12	12	100	25	-	130.04
5021-3F-0.5R	3	6	58	9	0.5	65.34	5021-12F-0.25R	12	12	100	25	0.25	149.33
5021-4F	4	6	58	12	-	48.20	5021-12F-0.5R	12	12	100	25	0.5	149.33
5021-4F-0.25R	4	6	58	12	0.25	65.99	5021-12F-0.75R	12	12	100	25	0.75	149.33
5021-4F-0.5R	4	6	58	12	0.5	65.99	5021-12F-1.0R	12	12	100	25	1.0	149.33
5021-5F	5	6	58	14	-	49.28	5021-12F-1.25R	12	12	100	25	1.25	149.33
5021-5F-0.25R	5	6	58	14	0.25	67.06	5021-12F-1.5R	12	12	100	25	1.5	149.33
5021-5F-0.5R	5	6	58	14	0.5	67.06	5021-12F-2.0R	12	12	100	25	2.0	149.33
5021-6F	6	6	75	15	-	50.13	5021-12F-3.0R	12	12	100	25	3.0	149.33
5021-6F-0.25R	6	6	75	15	0.25	69.52	5021-16F	16	16	125	35	-	211.03
5021-6F-0.5R	6	6	75	15	0.5	69.52	5021-16F-0.25R	16	16	125	35	0.25	229.13
5021-6F-0.75R	6	6	75	15	0.75	69.52	5021-16F-0.5R	16	16	125	35	0.5	229.13
5021-6F-1.0R	6	6	75	15	1.0	69.52	5021-16F-0.75R	16	16	125	35	0.75	229.13
5021-8F	8	8	75	22	-	68.24	5021-16F-1.0R	16	16	125	35	1.0	229.13
5021-8F-0.25R	8	8	75	22	0.25	87.73	5021-16F-1.25R	16	16	125	35	1.25	229.13
5021-8F-0.5R	8	8	75	22	0.5	87.73	5021-16F-1.5R	16	16	125	35	1.5	229.13
5021-8F-0.75R	8	8	75	22	0.75	87.73	5021-16F-2.0R	16	16	125	35	2.0	229.13
5021-8F-1.0R	8	8	75	22	1.0	87.73	5021-16F-3.0R	16	16	125	35	3.0	229.13
5021-8F-1.25R	8	8	75	22	1.25	87.73	5021-16F-4.0R	16	16	125	35	4.0	229.13
5021-8F-1.5R	8	8	75	22	1.5	87.73	5021-20F	20	20	150	40	-	351.35
5021-8F-2.0R	8	8	75	22	2.0	87.73	5021-20F-0.25R	20	20	150	40	0.25	371.71
5021-8F-3.0R	8	8	75	22	3.0	87.73	5021-20F-0.5R	20	20	150	40	0.5	371.71
5021-10F	10	10	100	25	-	99.51	5021-20F-1.0R	20	20	150	40	1.0	371.71
5021-10F-0.25R	10	10	100	25	0.25	119.01	5021-20F-1.25R	20	20	150	40	1.25	371.71
5021-10F-0.5R	10	10	100	25	0.5	119.01	5021-20F-1.5R	20	20	150	40	1.5	371.71
5021-10F-0.75R	10	10	100	25	0.75	119.01	5021-20F-2.0R	20	20	150	40	2.0	371.71
5021-10F-1.0R	10	10	100	25	1.0	119.01	5021-20F-3.0R	20	20	150	40	3.0	371.71
5021-10F-1.25R	10	10	100	25	1.25	119.01	5021-20F-4.0R	20	20	150	40	4.0	371.71
5021-10F-1.5R	10	10	100	25	1.5	119.01	5021-25F	25	25	150	50	-	487.07
5021-10F-2.0R	10	10	100	25	2.0	119.01	5021-32F	32	32	150	60	-	738.59

For Speeds & Feeds please see page 65.

6051 Series

6 Flute Harmonic Flute End Mill



Description

6 flute, solid carbide, long length, square end, straight shank, right hand helix, right hand cut, centre cutting, unequal flute spacing, Cupro Coated.

Application

Designed to give extremely high performance in the machining of steels and other tough materials including Aerospace Alloys. The radical flute geometry gives excellent removal rates and exceptional stability, whilst the flute spacing reduces machining noise by eliminating the harmonic effect.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £
6051-6F	6	6	75	18	-	50.24
6051-6F-0.5R	6	6	75	18	0.5	69.52
6051-6F-0.75R	6	6	75	18	0.75	69.52
6051-6F-1.0R	6	6	75	18	1.0	69.52
6051-8F	8	8	75	24	-	68.24
6051-8F-0.5R	8	8	75	24	0.5	87.73
6051-8F-0.75R	8	8	75	24	0.75	87.73
6051-8F-1.0R	8	8	75	24	1.0	87.73
6051-10F	10	10	100	30	-	99.51
6051-10F-0.5R	10	10	100	30	0.5	119.01
6051-10F-0.75R	10	10	100	30	0.75	119.01
6051-10F-1.0R	10	10	100	30	1.0	119.01
6051-12F	12	12	100	36	-	130.04
6051-12F-0.5R	12	12	100	36	0.5	149.33
6051-12F-0.75R	12	12	100	36	0.75	149.33
6051-12F-1.0R	12	12	100	36	1.0	149.33
6051-16F	16	16	125	50	-	211.03
6051-16F-0.5R	16	16	125	50	0.5	229.13
6051-16F-0.75R	16	16	125	50	0.75	229.13
6051-16F-1.0R	16	16	125	50	1.0	229.13
6051-20F	20	20	150	60	-	351.35
6051-20F-0.5R	20	20	150	60	0.5	371.71
6051-20F-1.75R	20	20	150	60	0.75	371.71
6051-20F-1.0R	20	20	150	60	1.0	371.71

For Speeds & Feeds please see page 65.

4081 Series

4 Flute End Mill For Steel, Harmonic Flute Geometry



Description

4 flute solid carbide, single end, standard length, square end, straight shank, right hand helix, right hand cut, centre cutting, unequal flute spacing, supplied with or without corner radius, AlTiN coated.

Application

Designed to give extremely high performance in the machining of steels and other tough materials including Aerospace Alloys. The radical flute geometry gives excellent removal rates and exceptional stability, whilst the flute spacing reduces machining noise by eliminating the harmonic effect.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
4081-3	3	6	58	9	43.18
4081-4	4	6	58	12	43.79
4081-5	5	6	58	14	44.65
4081-6	6	6	75	15	45.50
4081-8	8	8	75	22	62.01
4081-10	10	10	100	25	90.39
4081-12	12	12	100	28	118.15
4081-16	16	16	100	35	191.78
4081-20	20	20	100	40	320.33
4081-25	25	25	160	50	442.76
4081-32	32	32	160	60	671.47

For Speeds & Feeds please see page 65.

4081 Series Continued

4 Flute End Mill with Radius For Steel, Harmonic Flute Geometry

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £
4081-3-0.25R	3	6	58	9	0.25	62.26
4081-3-0.5R	3	6	58	9	0.5	62.26
4081-4-0.25R	4	6	58	12	0.25	63.48
4081-4-0.5R	4	6	58	12	0.5	63.48
4081-4-0.75R	4	6	58	12	0.75	63.48
4081-4-1.0R	4	6	58	12	1.0	63.48
4081-5-0.25R	5	6	58	14	0.25	63.48
4081-5-0.5R	5	6	58	14	1.0	63.48

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £
4081-5-0.75R	5	6	58	14	0.75	63.84
4081-5-1.0R	5	6	58	14	1.0	63.84
4081-6-0.25R	6	6	75	15	0.25	63.84
4081-6-0.5R	6	6	75	15	0.5	63.84
4081-6-0.75R	6	6	75	15	0.75	63.84
4081-6-1.0R	6	6	75	15	1.0	63.84
4081-6-1.25R	6	6	75	15	1.25	63.84
4081-6-1.5R	6	6	75	15	1.5	82.20
4081-6-2.0R	6	6	75	15	2.0	82.20
4081-8-0.25R	8	8	75	22	0.25	80.47
4081-8-0.5R	8	8	75	22	0.5	80.47
4081-8-0.75R	8	8	75	22	0.75	80.47
4081-8-1.0R	8	8	75	22	1.0	80.47
4081-8-1.25R	8	8	75	22	1.25	80.47
4081-8-1.5R	8	8	75	22	1.5	98.95
4081-8-2.0R	8	8	75	22	2.0	98.95
4081-8-3.0R	8	8	75	22	3.0	113.14
4081-10-0.25R	10	10	100	25	0.25	108.60
4081-10-0.5R	10	10	100	25	0.5	108.60
4081-10-0.75R	10	10	100	25	0.75	108.60
4081-10-1.0R	10	10	100	25	1.0	108.60
4081-10-1.25R	10	10	100	25	1.25	123.79
4081-10-1.5R	10	10	100	25	1.5	123.79
4081-10-2.0R	10	10	100	25	2.0	123.79
4081-10-3.0R	10	10	100	25	3.0	138.83
4081-12-0.25R	12	12	100	28	0.25	137.61
4081-12-0.5R	12	12	100	28	0.5	137.61
4081-12-0.75R	12	12	100	28	0.75	137.61
4081-12-1.0R	12	12	100	28	1.0	137.61
4081-12-1.25R	12	12	100	28	1.25	137.61
4081-12-1.5R	12	12	100	28	1.5	152.52
4081-12-2.0R	12	12	100	28	2.0	152.52
4081-12-3.0R	12	12	100	28	3.0	167.32
4081-16-0.25R	16	16	100	35	0.25	210.01
4081-16-0.5R	16	16	100	35	0.5	210.01
4081-16-0.75R	16	16	100	35	0.75	210.01
4081-16-1.0R	16	16	100	35	1.0	210.01
4081-16-1.25R	16	16	100	35	1.25	210.01
4081-16-1.5R	16	16	100	35	1.5	222.36
4081-16-2.0R	16	16	100	35	2.0	222.36
4081-16-3.0R	16	16	100	35	3.0	234.23
4081-16-4.0R	16	16	100	35	4.0	240.10
4081-20-0.25R	20	20	100	40	0.25	341.36
4081-20-0.5R	20	20	100	40	0.5	341.36
4081-20-0.75R	20	20	100	40	0.75	341.36
4081-20-1.0R	20	20	100	40	1.0	341.36
4081-20-1.25R	20	20	100	40	1.25	341.36
4081-20-1.5R	20	20	100	40	1.5	352.25
4081-20-2.0R	20	20	100	40	2.0	352.25
4081-20-3.0R	20	20	100	40	3.0	363.01
4081-20-4.0R	20	20	100	40	4.0	379.16

For Speeds & Feeds please see page 65.

7N22 Series

Micro Square End Series



Description

2 flutes square end, extra long neck, micro. TiAlN Coated.

Application

For rib processing and very fine operation, in steels, cast iron and hard materials. Coated for extended tool life.

Metric Sizes (mm)

CATALOGUE No.	SIZE	REACH	SHANK DIAMETER	NECK DIAMETER	LENGHT OF CUT	OVERALL LENGTH	PRICE £
7N2200400RJ	0.4	2	3	0.36	0.6	38	58.30
7N2200410RJ	0.4	4	3	0.36	0.6	38	58.30
7N2200500RJ	0.5	2	3	0.45	0.7	38	58.30
7N2200510RJ	0.5	4	3	0.45	0.7	38	58.30
7N2200520RJ	0.5	6	3	0.45	0.7	38	58.30
7N2200600RJ	0.6	2	3	0.55	0.9	38	58.30
7N2200610RJ	0.6	4	3	0.55	0.9	38	58.30
7N2200620RJ	0.6	6	3	0.55	0.9	38	58.30
7N2200701RJ	0.7	2	4	0.65	1	50	58.30
7N2200711RJ	0.7	4	4	0.65	1	50	58.30
7N2200721RJ	0.7	6	4	0.65	1	50	58.30
7N2200801RJ	0.8	4	4	0.75	1.2	50	52.30
7N2200811RJ	0.8	6	4	0.75	1.2	50	52.30
7N2200821RJ	0.8	8	4	0.75	1.2	50	52.30
7N2200901RJ	0.9	6	4	0.85	1.34	50	52.30
7N2200911RJ	0.9	8	4	0.85	1.35	50	52.30
7N2200921RJ	0.9	10	4	0.85	1.35	50	52.30
7N2201001RJ	1	6	4	0.97	1.5	50	52.30
7N2201011RJ	1	8	4	0.95	1.5	50	52.30
7N2201021RJ	1	10	4	0.95	1.5	50	52.30
7N2201031RJ	1	12	4	0.93	1.5	50	52.30
7N2201201RJ	1.2	6	4	1.17	1.5	50	52.30
7N2201211RJ	1.2	8	4	1.15	1.8	50	52.30
7N2201221RJ	1.2	10	4	1.15	1.8	50	52.30
7N2201231RJ	1.2	12	4	1.13	1.8	50	52.30
7N2201401RJ	1.4	6	4	1.37	2.1	50	52.30
7N2201411RJ	1.4	8	4	1.35	2.1	50	52.30
7N2201421RJ	1.4	10	4	1.35	2.1	50	52.30
7N2201431RJ	1.4	12	4	1.33	2.1	50	52.30
7N2201441RJ	1.4	16	4	1.31	2.1	50	52.30
7N2201501RJ	1.5	6	4	1.47	2.3	50	52.30
7N2201511RJ	1.5	10	4	1.45	2.3	50	52.30
7N2201521RJ	1.5	12	4	1.45	2.3	50	52.30

For Speeds & Feeds please see page 65.

Cyber End Mills for Steel & Exotics

CATALOGUE No.	SIZE	REACH	SHANK DIAMETER	NECK DIAMETER	LENGHT OF CUT	OVERALL LENGTH	PRICE £
7N2201531RJ	1.5	16	4	1.41	2.3	50	52.30
7N2201541RJ	1.5	18	4	1.41	2.3	63	52.30
7N2201551RJ	1.5	20	4	1.39	2.3	63	52.30
7N2201601RJ	1.6	6	4	1.57	2.4	50	52.30
7N2201611RJ	1.6	10	4	1.55	2.4	50	52.30
7N2201621RJ	1.6	12	4	1.53	2.4	50	52.30
7N2201631RJ	1.6	16	4	1.51	2.4	50	52.30
7N2201641RJ	1.6	20	4	1.49	2.4	63	52.30
7N2201701RJ	1.7	6	4	1.67	2.6	50	52.30
7N2201711RJ	1.7	10	4	1.65	2.6	50	52.30
7N2201721RJ	1.7	12	4	1.63	2.6	50	52.30
7N2201731RJ	1.7	16	4	1.61	2.6	50	52.30
7N2201741RJ	1.7	20	4	1.59	2.6	63	52.30
7N2201801RJ	1.8	6	4	1.77	2.7	50	52.30
7N2201811RJ	1.8	10	4	1.75	2.7	50	52.30
7N2201821RJ	1.8	12	4	1.73	2.7	50	52.30
7N2201831RJ	1.8	16	4	1.71	2.7	50	52.30
7N2201841RJ	1.8	20	4	1.69	2.7	50	52.30
7N2201901RJ	1.9	6	4	1.87	2.8	50	52.30
7N2201911RJ	1.9	10	4	1.85	2.8	50	52.30
7N2201921RJ	1.9	12	4	1.83	2.8	50	52.30
7N2201931RJ	1.9	16	4	1.81	2.8	50	52.30
7N2201941RJ	1.9	20	4	1.79	2.8	63	52.30
7N2202001RJ	2	6	4	1.97	3	50	52.30
7N2202011RJ	2	10	4	1.95	3	50	52.30
7N2202021RJ	2	16	4	1.91	3	50	52.30
7N2202031RJ	2	20	4	1.89	3	63	52.30
7N2202041RJ	2	30	4	1.89	3	75	52.30
7N2202501RJ	2.5	8	4	2.4	3.7	50	52.30
7N2202511RJ	2.5	10	4	2.4	3.7	50	52.30
7N2202521RJ	2.5	16	4	2.4	3.7	63	52.30
7N2202531RJ	2.5	20	4	2.4	3.7	63	52.30
7N2202541RJ	2.5	30	4	2.4	3.7	80	52.30
7N2203002RJ	3	8	6	2.85	4.5	50	58.30
7N2203012RJ	3	10	6	2.85	4.5	50	58.30
7N2203022RJ	3	16	6	2.85	4.5	63	58.30
7N2203032RJ	3	20	6	2.85	4.5	63	58.30
7N2203042RJ	3	30	6	2.85	4.5	80	58.30

For Speeds & Feeds please see page 65.

6011 Series

Multi-Flute End Mill For Steel



Description

Multi-flute carbide end mill, fast helix, square end straight shank, 3 different lengths available. Manufactured from Ultra Wear Resistant Micrograin Carbide, AlTiN coated for enhanced life and heat resistance.

Application

Designed for the profiling of Steels up to 60 Rockwell C, Cyber Series end mills are especially suitable for High Speed Machining of hard materials. The fast helix plus specially developed geometry and coating results in excellent surface finish and extended tool life.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	No. OF FLUTES	PRICE £
6011-3D	3	6	55	6	5	51.64
6011-4D	4	6	55	8	5	51.64
6011-5D	5	6	55	10	5	51.64
6011-6D	6	6	55	12	6	49.04
6011-8D	8	8	59	16	6	59.84
6011-10D	10	10	67	20	6	100.35
6011-12D	12	12	74	24	6	127.87
6011-16D	16	16	83	32	8	211.40
6011-20D	20	20	93	40	8	357.86

For Speeds & Feeds please see page 65.

6021 Series

Multi-Flute End Mill For Steel



Description

Multi-flute carbide end mill, fast helix, square end straight shank, 3 different lengths available. Manufactured from Ultra Wear Resistant Micrograin Carbide, AlTiN coated for enhanced life and heat resistance.

Application

Designed for the profiling of Steels up to 60 Rockwell C, Cyber Series end mills are especially suitable for High Speed Machining of hard materials. The fast helix plus specially developed geometry and coating results in excellent surface finish and extended tool life.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	No. OF FLUTES	PRICE £
6021-3D	3	6	58	9	5	57.18
6021-4D	4	6	58	12	5	57.18
6021-5D	5	6	58	15	5	57.18
6021-6D	6	6	58	18	6	52.94
6021-8D	8	8	63	24	6	66.47
6021-10D	10	10	75	30	6	111.47
6021-12D	12	12	84	36	6	142.47
6021-16D	16	16	93	48	8	234.83
6021-20D	20	20	100	50	8	397.59

For Speeds & Feeds please see page 65.

6021 Series

Multi-Flute End Mill For Steel With Radius



Description

Multi-flute carbide end mill, fast helix, square end straight shank, 3 different lengths available. Manufactured from Ultra Wear Resistant Micrograin Carbide, AlTiN coated for enhanced life and heat resistance.

Application

Designed for the profiling of Steels up to 60 Rockwell C, Cyber Series end mills are especially suitable for High Speed Machining of hard materials. The fast helix plus specially developed geometry and coating results in excellent surface finish and extended tool life.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	No. OF FLUTES	RADIUS	PRICE £
6021-6D-0.5R	6	6	58	18	6	0.5	77.68
6021-6D-1.0R	6	6	58	18	6	1.0	77.68
6021-8D-0.5R	8	8	63	24	6	0.5	92.55
6021-8D-1.0R	8	8	63	24	6	1.0	92.55
6021-10D-0.5R	10	10	75	30	6	0.5	136.33
6021-10D-1.0R	10	10	75	30	6	1.0	136.33
6021-12D-0.5R	12	12	84	36	6	0.5	168.44
6021-12D-1.0R	12	12	84	36	6	1.0	168.44
6021-16D-0.5R	16	16	93	48	8	0.5	263.25
6021-16D-1.0R	16	16	93	48	8	1.0	263.25
6021-20D-0.5R	20	20	100	50	8	0.5	428.95
6021-20D-1.0R	20	20	100	50	8	1.0	428.95

For Speeds & Feeds please see page 65.

6031 Series

Multi-Flute End Mill For Steel



Description

Multi-flute carbide end mill, fast helix, square end straight shank, 3 different lengths available. Manufactured from Ultra Wear Resistant Micrograin Carbide, AlTiN coated for enhanced life and heat resistance.

Application

Designed for the profiling of Steels up to 60 Rockwell C, Cyber Series end mills are especially suitable for High Speed Machining of hard materials. The fast helix plus specially developed geometry and coating results in excellent surface finish and extended tool life.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	No. OF FLUTES	PRICE £
6031-6D	6	6	75	32	6	83.47
6031-8D	8	8	75	32	6	99.38
6031-10D	10	10	100	50	6	136.33
6031-12D	12	12	100	50	6	171.57
6031-16D	16	16	125	62	8	281.82
6031-20D	20	20	130	65	8	477.16

For Speeds & Feeds please see page 65.

6031 Series

Multi-Flute End Mill For Steel With Radius



Description

Multi-flute carbide end mill, fast helix, square end straight shank, 3 different lengths available. Manufactured from Ultra Wear Resistant Micrograin Carbide, AlTiN coated for enhanced life and heat resistance.

Application

Designed for the profiling of Steels up to 60 Rockwell C, Cyber Series end mills are especially suitable for High Speed Machining of hard materials. The fast helix plus specially developed geometry and coating results in excellent surface finish and extended tool life.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	No. OF FLUTES	RADIUS	PRICE £
6031-6D-0.5R	6	6	75	32	6	0.5	109.57
6031-6D-1.0R	6	6	75	32	6	1.0	109.57
6031-8D-0.5R	8	8	75	32	6	0.5	125.53
6031-8D-1.0R	8	8	75	32	6	1.0	125.53
6031-10D-0.5R	10	10	100	50	6	0.5	161.18
6031-10D-1.0R	10	10	100	50	6	1.0	161.18
6031-12D-0.5R	12	12	100	50	6	0.5	196.44
6031-12D-1.0R	12	12	100	50	6	1.0	196.44
6031-16D-0.5R	16	16	125	62	8	0.5	307.78
6031-16D-1.0R	16	16	125	62	8	1.0	307.78
6031-20D-0.5R	20	20	130	65	8	0.5	504.35
6031-20D-1.0R	20	20	130	65	8	1.0	504.35

For Speeds & Feeds please see page 65.

NEW

6061 Series

Multi-Flute End Mill For Steel



Description

Multi-flute carbide end mill, fast helix, square end straight shank. Manufactured from Ultra Wear Resistant Micrograin Carbide, CUPRO coated for enhanced life and heat resistance.

Application

Designed for the profiling of Steels up to 60 Rockwell C, Cyber Series end mills are especially suitable for High Speed Machining of hard materials. The fast helix plus specially developed geometry and coating results in excellent surface finish and extended tool life.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	No. OF FLUTES	PRICE £
6061-6F	6	6	58	18	6	52.94
6061-8F	8	8	63	24	8	66.47
6061-10F	10	10	70	25	10	111.47
6061-12F	12	12	84	36	12	142.47
6061-16F	16	16	89	48	14	234.83
6061-20F	20	20	100	59	16	397.59

For Speeds & Feeds please see page 65.

Cutting Data for Steel & Exotics

Cutting Data for High Speed Milling (H.S.M.) Cyber Series 2002 / 2012 / 2152 / 2162 / 2112 / 7N22

		END MILL DIAMETER												
		0.5mm	1mm	2mm	3mm	4mm	5mm	6mm	8mm	10mm	12mm	14mm	16mm	20mm
D.O.C.(ap)		0.02	0.05	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
MATERIAL GROUP	SURFACE SPEED	FEED (mm/Tooth)												
	METRES/MIN													
STEEL 40-45 HRc	<1000	0.005	0.012	0.030	0.040	0.045	0.050	0.060	0.065	0.070	0.075	0.080	0.090	0.100
STEEL 45-50 HRc	<750	0.004	0.010	0.027	0.035	0.037	0.040	0.050	0.060	0.060	0.070	0.075	0.085	0.095
STEEL 50-55 HRc	<470	0.003	0.008	0.025	0.030	0.033	0.037	0.045	0.055	0.060	0.065	0.070	0.075	0.085
STEEL 55-60 HRc	<350	0.002	0.007	0.022	0.028	0.030	0.033	0.038	0.050	0.055	0.060	0.065	0.075	0.080
STEEL 60-62 HRc	<250	0.002	0.006	0.020	0.025	0.028	0.030	0.035	0.040	0.050	0.055	0.060	0.065	0.070

MAX STEPOVER (Pitch) 0.2mm for Roughing 0.1mm for Finishing.

Cutting Data for Series 4081 / 5021 / 6051 End Mills

MATERIAL GROUP	SURFACE SPEED	FEED (mm/Tooth) END MILL DIAMETER									
	METRES/MIN	3mm	4mm	5mm	6mm	8mm	10mm	12mm	16mm	20mm	
Stainless Steel Soft (300 Series)	80-120	0.015	0.025	0.030	0.040	0.050	0.060	0.060	0.065	0.065	
Stainless Steel Hard (400 Series)	50-70	0.013	0.015	0.023	0.030	0.040	0.045	0.050	0.055	0.060	
Hi-Temperature Alloys	20-30	0.007	0.010	0.015	0.018	0.023	0.028	0.035	0.045	0.055	
Titanium	50-60	0.010	0.012	0.015	0.020	0.025	0.030	0.040	0.050	0.060	
Steel Soft	120-160	0.015	0.025	0.030	0.040	0.050	0.060	0.070	0.075	0.090	

Based on slotting 0.5 x D with 4081. For heavier cuts decrease feed, for lighter cuts increase feed. Tools should ideally be held in a Hydraulic Chuck.

Cutting Data for High Speed Milling (H.S.M.) Cyber Series 6011 / 6021 / 6031 / 6061

MATERIAL GROUP	SURFACE SPEED	FEED (mm/Tooth) END MILL DIAMETER									
	METRES/MIN	3mm	4mm	5mm	6mm	8mm	10mm	12mm	14mm	16mm	20mm
STEEL 45-50 HRc	190-210	0.008	0.011	0.016	0.022	0.034	0.043	0.052	0.060	0.075	0.094
STEEL 50-55 HRc	150-170	0.007	0.009	0.015	0.020	0.030	0.038	0.045	0.053	0.070	0.088
STEEL 55-60 HRc	115-135	0.006	0.008	0.013	0.018	0.028	0.035	0.042	0.050	0.065	0.081
STEEL 60-62 HRc	90-110	0.004	0.006	0.010	0.014	0.025	0.031	0.038	0.043	0.059	0.074

Cutting data is given for shoulder-milling:

Axial depth of cut: **1 x d (ap)**

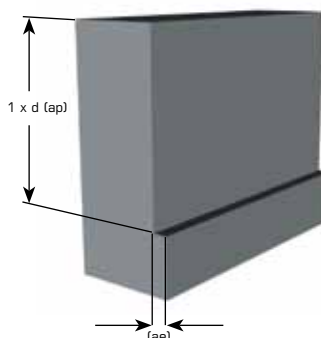
Radial width of cut: **(ae)**

Up to:

ø6mm 0.02 x d

ø8 - ø12mm 0.025 x d

ø14 - ø 20mm 0.030 x d



2111 Series

PCD End Mill For Graphite & Carbon Fibre



Description

PCD end mill, solid carbide shank, with corner radius and necking for extra reach.

Application

Specifically designed for the efficient machining of **Graphite, Metal Matrix** and other similarly abrasive materials.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	No. OF TEETH	RADIUS	PRICE £
2111-2.0	2*	6	75	2	10	1	0.2	144.09
2111-3.0	3	6	75	3	15	2	0.2	154.69
2111-4.0	4	6	75	4	20	2	0.2	154.69
2111-5.0	5	6	75	5	25	2	0.2	154.69
2111-5.0-0.5R	5	6	75	5	25	2	0.5	154.69
2111-5.0-1.0R	5	6	75	5	25	2	1.0	154.69
2111-6.0	6	6	100	8	30	2	0.2	160.56
2111-6.0-0.3R	6	6	100	8	30	2	0.3	160.56
2111-6.0-0.5R	6	6	100	8	30	2	0.5	160.56
2111-6.0-1.0R	6	6	100	8	30	2	1.0	160.56
2111-8.0	8	8	100	10	40	2	0.2	175.03
2111-8.0-0.5R	8	8	100	10	40	2	0.5	175.03
2111-8.0-1.0R	8	8	100	10	40	2	1.0	175.03
2111-8.0-2.0R	8	8	100	10	40	2	2.0	175.03
2111-10.0	10	10	100	12	45	2	0.2	191.51
2111-10.0-0.5R	10	10	100	12	45	2	0.5	191.51
2111-10.0-1.0R	10	10	100	12	45	2	1.0	191.51
2111-10.0-3.0R	10	10	100	12	45	2	3.0	191.51
2111-12.0	12	12	100	12	45	2	0.2	195.62
2111-12.0-0.5R	12	12	100	12	45	2	0.5	195.62
2111-12.0-1.0R	12	12	100	12	45	2	1.0	195.62
2111-12.0-4.0R	12	12	100	12	45	2	4.0	195.62
2111-16.0-5.0R	16	16	150	16	50	2	5.0	214.08
2111-20.0-6.0R	20	20	150	20	50	2	6.0	332.69

Note: Tools marked * are single flute.

For Speeds & Feeds please see page 79.

2151 Series

2 Flute XLS PCD End Mills



Description

PCD end mill, extra long series, solid carbide shank, with corner radius and necking for extra reach

Application

Specifically designed for the efficient manufacturing of **Graphite, Metal Matrix** and other similarly abrasive materials.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	RADIUS	PRICE £
2151-8.0	8	8	150	10	40	0.2	193.32
2151-8.0-0.5R	8	8	150	10	40	0.5	193.32
2151-8.0-1.0R	8	8	150	10	40	1.0	193.32
2151-10.0	10	10	150	12	45	0.2	207.33
2151-10.0-0.5R	10	10	150	12	45	0.5	207.33
2151-10.0-1.0R	10	10	150	12	45	1.0	207.33
2151-12.0	12	12	150	12	45	0.2	217.55
2151-12.0-0.5R	12	12	150	12	45	0.5	217.55
2151-12.0-1.0R	12	12	150	12	45	1.0	217.55

For Speeds & Feeds please see page 79.

2102 Series

Ball Nose PCD End Mill For Graphite & Carbon Fibre



Description

Ball Nose PCD end mill, solid carbide shank, with necking for extra reach.

Application

Specifically designed for the efficient machining of **Graphite**, **Metal Matrix** and other similarly abrasive materials.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	No. OF TEETH	PRICE £
2102-2.0	2*	6	75	2	10	1	144.09
2102-3.0	3	6	75	3	15	2	154.69
2102-4.0	4	6	75	4	20	2	154.69
2102-5.0	5	6	75	5	25	2	154.69
2102-6.0	6	6	100	6	30	2	160.56
2102-8.0	8	8	100	8	40	2	175.03
2102-10.0	10	10	100	10	45	2	191.51
2102-12.0	12	12	100	12	45	2	195.62
2102-16.0	16	16	150	16	50	2	214.08
2102-20.0	20	20	150	20	50	2	332.69

Note: Tools marked * are single flute.

For Speeds & Feeds please see page 79.

2132 Series

2 Flute XLS PCD Ball Nose End Mills



Description

Ball Nose PCD end mill, extra long series, solid carbide shank, with necking for extra reach

Application

Specifically designed for the efficient machining of **Graphite, Metal Matrix** and other similarly abrasive materials.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	PRICE £
2132-8.0	8	8	150	8	40	193.32
2132-10.0	10	10	150	10	45	207.33
2132-12.0	12	12	150	12	45	217.55

For Speeds & Feeds please see page 79.

2071 Series

2 Flute Diamond Coated End Mills For Graphite



Description

2 flute solid carbide end mill, 30° helix, manufactured from Special Wear Resistant Micrograin Carbide, Diamond Coated.

Application

Specifically designed for the efficient machining of **Graphite** and other similarly abrasive materials. The diamond coating gives vastly improved life over equivalent carbide tools.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	PRICE £
2071-2E	2	6	75	7	8	87.71
2071-3E	3	6	75	8	9	87.71
2071-4E	4	6	75	11	15	87.71
2071-5E	5	6	75	13	18	87.71
2071-6E	6	6	100	13	20	72.00
2071-8E	8	8	100	20	25	99.18
2071-10E	10	10	100	22	30	126.23
2071-12E	12	12	100	25	40	154.23

For Speeds & Feeds please see page 79.

2071 Series

2 Flute Diamond Coated End Mills with Radius for Graphite



Description

2 flute solid carbide end mill, 30° right hand helix, manufactured from Special Wear Resistant Micrograin Carbide, supplied with corner radius.

Application

Specifically designed for the efficient machining of **Graphite** and other similarly abrasive materials. The diamond coating gives vastly improved tool life over equivalent carbide tools.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	RADIUS	PRICE £
2071-6E-1.0R	6	6	100	13	20	1.0	93.41
2071-8E-1.0R	8	8	100	20	25	1.0	120.06
2071-10E-1.0R	10	10	100	22	30	1.0	146.93
2071-12E-1.0R	12	12	100	25	40	1.0	174.64

For Speeds & Feeds please see page 79.

2101 Series

2 Flute Diamond Coated End Mills For Graphite



Description

2 flute, square end, solid carbide end mill, 30° helix manufactured from Special Wear Resistant Micrograin Carbide, Diamond Coated.

Application

Specifically designed for the efficient machining of **Graphite** and other similarly abrasive materials. This tool is similar to series 2071 but with smaller shank size for improved access in tight situations.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
2101-2E	2	3	75	7	87.71
2101-3E	3	3	75	8	87.71
2101-4E	4	4	75	11	87.71
2101-5E	5	5	75	13	87.71

For Speeds & Feeds please see page 79.

4121 Series

4 Flute Diamond Coated End Mills For Graphite



Description

4 flute solid carbide end mill, 30° helix, manufactured from Micrograin Carbide, Diamond Coated.

Application

Designed to give superior performance in applications including the machining of graphite and other extremely abrasive materials. The Diamond Coating gives vastly improved tool life.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
4121-3E	3	3	40	10	33.78
4121-4E	4	4	50	14	45.01
4121-5E	5	5	50	16	72.72
4121-6E	6	6	64	19	73.85
4121-8E	8	8	64	21	103.41
4121-10E	10	10	70	22	136.06
4121-12E	12	12	76	25	156.77
4121-16E	16	16	89	32	237.72
4121-20E	20	20	100	40	361.94

For Speeds & Feeds please see page 79.

2072 Series

2 Flute Ball Nose Diamond Coated End Mill For Graphite



Description

2 flute solid carbide ball nosed end mill, 30° helix, manufactured from Special Wear Resistant Micrograin Carbide, Diamond Coated.

Application

Specifically designed for the efficient machining of **Graphite** and other similarly abrasive materials. The diamond coating gives vastly improved life over equivalent carbide tools.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	PRICE £
2072-2E	2	6	75	4	8	89.79
2072-3E	3	6	75	5	9	89.79
2072-4E	4	6	75	6	15	89.79
2072-5E	5	6	75	7	18	89.79
2072-6E	6	6	100	8	20	74.93
2072-8E	8	8	100	10	25	101.60
2072-10E	10	10	100	12	30	128.52
2072-12E	12	12	150	16	40	156.24

For Speeds & Feeds please see page 79.

2092 Series

2 Flute Ball Nose Diamond Coated End Mill For Graphite



Description

2 flute, ball nose, solid carbide end mill, 30° helix manufactured from Special Wear Resistant Micrograin Carbide, Diamond Coated.

Application

Specifically designed for the efficient machining of **Graphite** and other similarly abrasive materials. This tool is similar to series 2072 but with smaller shank size for improved access in tight situations.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
2092-2E	2	3	75	4	92.49
2092-3E	3	3	75	5	92.49
2092-4E	4	4	75	6	92.49
2092-5E	5	5	75	7	92.49

For Speeds & Feeds please see page 79.

4072 Series

4 Flute Ball Nose End Mill Diamond Coated For Graphite



Description

4 flute ball nose, solid carbide end mill, 30° helix, manufactured from special Ultra Wear Resistant Micrograin Carbide, Diamond Coated.

Application

Designed for the efficient machining of **Graphite** and other similarly abrasive materials, four flutes give improved performance in finishing applications.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	REACH	PRICE £
4072-2E	2	3	75	4	8	92.49
4072-3E	3	3	75	5	9	92.49
4072-4E	4	4	75	6	15	92.49
4072-5E	5	5	75	7	18	92.49
4072-6E	6	6	100	8	20	77.18
4072-8E	8	8	100	10	25	104.65
4072-10E	10	10	100	12	30	132.49
4072-12E	12	12	100	16	40	160.93

For Speeds & Feeds please see page 79.

NEW

9001 Series

Multi-Flute Router



Description

Multi-Flute, square end, manufactured from Special Wear Resistant Micrograin Carbide, available uncoated or diamond coated.

Application

Specifically designed for the efficient machining of Carbon Fibre and other man-made composites. Special flute design with chip breaker gives improved finish and reduced delamination. Available with diamond coating for increased tool life.

Metric Sizes (mm)

CATALOGUE No.	CATALOGUE No. COATED	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	UNCOATED PRICE £	COATED PRICE £
9001-6	9001-6E	6	6	75	28	48.92	95.95
9001-8	9001-8E	8	8	75	28	61.72	131.46
9001-10	9001-10E	10	10	100	40	97.06	177.74
9001-12	9001-12E	12	12	100	40	112.08	204.53

190 Series

Diamond Cut Router For Glass Fibre



Description

Multiple flute, solid carbide, diamond cut, single end, right hand cut, straight shank, available in four different end cuts.

Application

Designed for use on glass fibre and similar materials. Unique cutting geometry provides an easy cutting action and good surface finish on both hand and CNC operated applications.

Imperial Sizes (inches)

CATALOGUE No.	HEAD DIAMETER	FLUTE LENGTH	SHANK DIAMETER	OVERALL LENGTH	PRICE £
190-1215-10	1/16	3/16	1/8	1-1/2	10.33
190-1215-20	1/16	3/16	1/8	1-1/2	10.77
190-1215-30	1/16	3/16	1/8	1-1/2	11.07
190-1215-40	1/16	3/16	1/8	1-1/2	11.88
190-2345-10	1/8	1/2	1/8	1-1/2	10.88
190-2345-20	1/8	1/2	1/8	1-1/2	11.07
190-2345-30	1/8	1/2	1/8	1-1/2	11.46
190-2345-40	1/8	1/2	1/8	1-1/2	12.23
190-3445-10	3/16	5/8	3/16	2	17.79
190-3445-20	3/16	5/8	3/16	2	18.40
190-3445-30	3/16	5/8	3/16	2	19.47
190-3445-40	3/16	5/8	3/16	2	20.42
190-4445-10	3/16	5/8	1/4	2	26.41
190-4445-20	3/16	5/8	1/4	2	26.41
190-4445-30	3/16	5/8	1/4	2	27.43
190-4445-40	3/16	5/8	1/4	2	27.67
190-5555-10	1/4	3/4	1/4	2	17.36
190-5555-20	1/4	3/4	1/4	2	18.90
190-5555-30	1/4	3/4	1/4	2	21.17
190-5555-40	1/4	3/4	1/4	2	22.21
190-6555-10	1/4	3/4	1/4	2-1/2	19.41
190-6555-20	1/4	3/4	1/4	2-1/2	21.17
190-6555-30	1/4	3/4	1/4	2-1/2	21.76
190-6555-40	1/4	3/4	1/4	2-1/2	22.40
190-7555-10	1/4	1	1/4	3	27.79
190-7555-20	1/4	1	1/4	3	31.31
190-7555-30	1/4	1	1/4	3	31.01
190-7555-40	1/4	1	1/4	3	33.52
190-7625-10	5/16	1	5/16	2-1/2	36.56
190-7625-20	5/16	1	5/16	2-1/2	37.23
190-7625-30	5/16	1	5/16	2-1/2	38.88
190-7625-40	5/16	1	5/16	2-1/2	39.56
190-8680-10	3/8	1	3/8	2-1/2	45.12
190-8680-20	3/8	1	3/8	2-1/2	45.39
190-8680-30	3/8	1	3/8	2-1/2	49.93
190-8680-40	3/8	1	3/8	2-1/2	50.53
190-9745-10	1/2	1	1/2	3	69.07
190-9745-20	1/2	1	1/2	3	70.36
190-9745-30	1/2	1	1/2	3	75.84
190-9745-40	1/2	1	1/2	3	79.10

Metric Sizes (mm)

CATALOGUE No.	HEAD DIAMETER	FLUTE LENGTH	SHANK DIAMETER	OVERALL LENGTH	PRICE £
190-1181-10	3	12.5	3	38	10.75
190-1181-20	3	12.5	3	38	12.42
190-1181-30	3	12.5	3	38	12.42
190-1181-40	3	12.5	3	38	12.42
190-1575-10	4	16	4	50	26.12
190-1575-20	4	16	4	50	26.12
190-1575-30	4	16	4	50	26.12
190-1575-40	4	16	4	50	26.12
190-1969-10	5	16	5	50	26.41
190-1969-20	5	16	5	50	26.41
190-1969-30	5	16	5	50	26.41
190-1969-40	5	16	5	50	26.41
190-2362-10	6	19	6	50	34.35
190-2362-20	6	19	6	50	34.35
190-2362-30-S	6	19	6	50	34.35
190-2362-30	6	19	6	75	34.35
190-2362-40	6	19	6	50	34.35
190-3150-10	8	22	8	64	45.88
190-3150-20	8	22	8	64	47.18
190-3150-30	8	22	8	64	47.18
190-3150-40	8	22	8	64	47.18
190-3937-10	10	25	10	75	60.30
190-3937-20	10	25	10	75	67.04
190-3937-30	10	25	10	75	67.04
190-3937-40	10	25	10	75	67.04
190-4724-10	12	25	12	75	91.89
190-4724-20	12	25	12	75	94.68
190-4724-30	12	25	12	75	94.68
190-4724-40	12	25	12	75	94.68



Burr End Cut -20

-10	=	No End Cut
-20	=	Burr End Cut
-30	=	End Mill End Cut
-40	=	Drill Point

Cutting Data for Graphite

2071 / 2101 / 4121

Based on a slot of 1d radial x 0.25d axial depth or a finishing cut of 0.1d radial depth x 1d axial depth of cut.

DIAMETER	FEED PER TOOTH (mm)	SPINDLE SPEED R.P.M.
2mm	0.010	max. available
3mm	0.015	max. available
4mm	0.020	max. available
5mm	0.025	max. available
6mm	0.030	max. available
8mm	0.040	max. available
10mm	0.050	max. available
12mm	0.040	max. available

2072 / 2092 / 4072

Based on a slot of 1d radial x 0.25d axial depth or a finishing cut of 0.1d radial depth x 1d axial depth of cut.

TOOL DIAMETER (ød)	DEPTH OF CUT (mm)	STEPOVER (mm)	R.P.M.	FEED (mm / min)
2	0.1	0.2	max. available	1200
3	0.1	0.2	max. available	1400
4	0.2	0.2	max. available	1600
5	0.2	0.2	max. available	2000
6	0.2	0.2	max. available	2400
8	0.2	0.2	max. available	2600
10	0.3	0.2	max. available	2800
12	0.3	0.2	max. available	3000

Cutting Data for Carbon Fibre Composites

2111 / 2151 / 2102 / 2132

Based on a slot of 1d radial x 0.25d axial depth or a finishing cut of 0.1d radial depth x 1d axial depth of cut.

TOOL DIAMETER (ød)	FEED PER TOOTH (mm)	SINGLE SPEED R.P.M.
2	0.01 - 0.03	max. available
3	0.02 - 0.04	max. available
4	0.025 - 0.045	max. available
5	0.03 - 0.05	up to 40,000 RPM
6	0.035 - 0.06	up to 37,000 RPM
8	0.04 - 0.07	up to 30,000 RPM
10	0.04 - 0.10	up to 25,000 RPM
12	0.045 - 0.12	up to 22,000 RPM
16	0.05 - 0.15	up to 16,000 RPM
20	0.06 - 0.20	up to 14,000 RPM

In general, roughing operations are run at the lower RPM's, finishing at higher.
Similarly a finishing operation will utilise a lower feed per tooth than a roughing operation.

2011 Series

2 Flute Single End Coated End Mill



Description

2 flute solid carbide square end, straight shank, 30° right hand helix, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide, AlTiN coated.

Application

Designed for applications requiring extra life, providing higher surface speeds and increased feed rates. These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively, we can make complete to your specifications.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
2011-1.0C	1	3	38	3	28.48
2011-1.5C	1.5	3	38	5	28.48
2011-2.0C	2	3	38	7	28.48
2011-2.5C	2.5	3	38	7	28.48
2011-3.0C	3	3	38	9	28.48
2011-3.5C	3.5	4	51	12	34.16
2011-4.0C	4	4	51	14	34.16
2011-4.5C	4.5	5	51	14	39.08
2011-5.0C	5	5	51	16	39.08
2011-6.0C	6	6	64	19	40.31
2011-7.0C	7	8	64	19	46.92
2011-8.0C	8	8	64	21	47.95
2011-9.0C	9	10	70	22	64.08
2011-10.0C	10	10	70	22	69.26
2011-12.0C	12	12	76	25	85.72
2011-16.0C	16	16	89	32	154.09
2011-20.0C	20	20	102	38	306.82

For Speeds & Feeds please see page 99.

3031 Series

3 Flute Single End Coated End Mill



Description

3 flute, solid carbide, square end, straight shank, 30° right hand helix, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide, AlTiN coated.

Application

Designed for applications requiring extra life, providing higher surface speeds and increased feed rates. These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively, we can make complete to your specifications.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
3031-2.0C	2	6	53	6	39.93
3031-2.5C	2.5	6	53	6	39.93
3031-3.0C	3	6	57	7	39.93
3031-3.5C	3.5	6	57	7	39.93
3031-4.0C	4	6	57	8	39.93
3031-4.5C	4.5	6	57	8	39.93
3031-5.0C	5	6	57	10	39.93
3031-5.5C	5.5	6	57	10	39.93
3031-6.0C	6	6	57	10	42.49
3031-7.0C	7	8	63	13	53.54
3031-8.0C	8	8	63	16	50.55
3031-9.0C	9	10	72	16	72.33
3031-10.0C	10	10	72	19	84.10
3031-12.0C	12	12	83	22	104.78
3031-14.0C	14	14	83	22	137.98
3031-16.0C	16	16	92	26	170.15
3031-18.0C	18	18	92	26	249.53
3031-20.0C	20	20	104	32	284.02

For Speeds & Feeds please see page 99.

4061 Series

4 Flute Single End Coated End Mill



Description

4 flute, solid carbide, square end, straight shank, 30° right hand helix, centre cutting, manufactured from Ultra Wear Resistant Micrograin Carbide, AlTiN coated.

Application

Designed for 4 flute end mill applications where higher surface speeds and increased feed rates combined with longer tool life are required. These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively, we can make complete to your specifications.

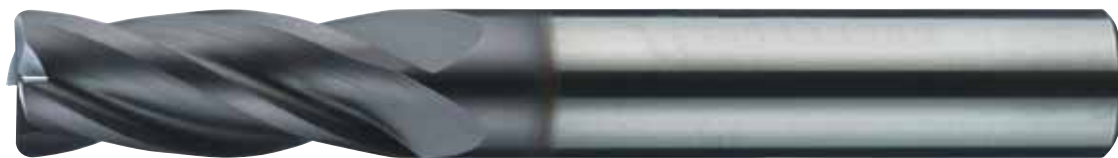
Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
4061-2.0C	2	6	53	7	39.93
4061-2.5C	2.5	6	53	7	39.93
4061-3.0C	3	6	55	8	39.93
4061-3.5C	3.5	6	55	10	39.93
4061-4.0C	4	6	55	11	39.93
4061-4.5C	4.5	6	55	11	39.93
4061-5.0C	5	6	55	13	39.93
4061-5.5C	5.5	6	55	13	39.93
4061-6.0C	6	6	58	13	42.49
4061-7.0C	7	8	63	16	49.58
4061-8.0C	8	8	64	19	50.55
4061-9.0C	9	10	72	19	72.33
4061-10.0C	10	10	72	22	84.10
4061-12.0C	12	12	84	26	104.78
4061-14.0C	14	14	84	26	137.98
4061-16.0C	16	16	92	32	170.15
4061-18.0C	18	18	92	32	249.53
4061-20.0C	20	20	105	38	284.02

For Speeds & Feeds please see page 99.

4061 Series

4 Flute Single End Coated End Mill With Radius



Description

4 flute solid carbide, square end with corner radius, straight shank, 30° right hand helix, centre cutting. Manufactured from Ultra Wear Resistant Micrograin Carbide, AlTiN coated.

Application

Designed for conventional milling applications where corner radius is required. AlTiN coating gives improved performance and tool life.

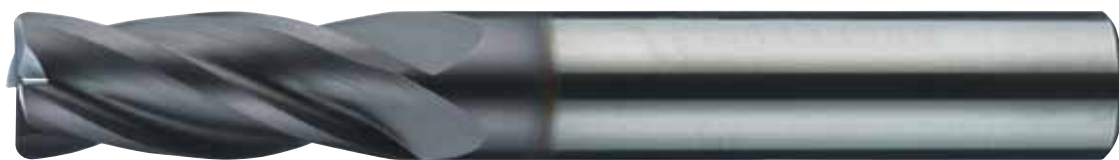
Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £
4061-3.0C-0.5R	3	6	55	8	0.5	57.73
4061-3.0C-1.0R	3	6	55	8	1.0	60.89
4061-4.0C-0.5R	4	6	55	11	0.5	57.73
4061-4.0C-1.0R	4	6	55	11	1.0	60.89
4061-5.0C-0.5R	5	6	55	13	0.5	57.73
4061-5.0C-1.0R	5	6	55	13	1.0	60.89
4061-6.0C-0.5R	6	6	58	13	0.5	60.31
4061-6.0C-1.0R	6	6	58	13	1.0	60.31
4061-6.0C-1.5R	6	6	58	13	1.5	61.64
4061-6.0C-2.0R	6	6	58	13	2.0	62.26
4061-8.0C-0.5R	8	8	64	19	0.5	68.32
4061-8.0C-1.0R	8	8	64	19	1.0	68.32
4061-8.0C-1.5R	8	8	64	19	1.5	70.38
4061-8.0C-2.0R	8	8	64	19	2.0	70.48
4061-8.0C-3.0R	8	8	64	19	3.0	71.62
4061-10.0C-0.5R	10	10	72	22	0.5	101.90
4061-10.0C-1.0R	10	10	72	22	1.0	101.90
4061-10.0C-1.5R	10	10	72	22	1.5	101.90
4061-10.0C-2.0R	10	10	72	22	2.0	103.79
4061-10.0C-3.0R	10	10	72	22	3.0	104.91

For Speeds & Feeds please see page 99.

4061 Series Continued

4 Flute Single End Coated End Mill With Radius



Description

4 flute solid carbide, square end with corner radius, straight shank, 30° right hand helix, centre cutting. Manufactured from Ultra Wear Resistant Micrograin Carbide, AlTiN coated.

Application

Designed for conventional milling applications where corner radius is required. AlTiN coating gives improved performance and tool life.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	RADIUS	PRICE £
4061-12.0C-0.5R	12	12	84	26	0.5	122..53
4061-12.0C-1.0R	12	12	84	26	1.0	122..53
4061-12.0C-1.5R	12	12	84	26	1.5	122..53
4061-12.0C-2.0R	12	12	84	26	2.0	122..53
4061-12.0C-3.0R	12	12	84	26	3.0	124.38
4061-16.0C-0.5R	16	16	92	32	0.5	187.96
4061-16.0C-1.0R	16	16	92	32	1.0	187.96
4061-16.0C-1.5R	16	16	92	32	1.5	187.96
4061-16.0C-2.0R	16	16	92	32	2.0	187.96
4061-16.0C-3.0R	16	16	92	32	3.0	191.37
4061-16.0C-4.0R	16	16	92	32	4.0	194.62
4061-20.0C-0.5R	20	20	105	38	0.5	301.77
4061-20.0C-1.0R	20	20	105	38	1.0	301.77
4061-20.0C-1.5R	20	20	105	38	1.5	301.77
4061-20.0C-2.0R	20	20	105	38	2.0	301.77
4061-20.0C-3.0R	20	20	105	38	3.0	304.40
4061-20.0C-4.0R	20	20	105	38	4.0	305.77

For Speeds & Feeds please see page 99.

2171 Series

Miniature Corner Rounding Cutters



Description

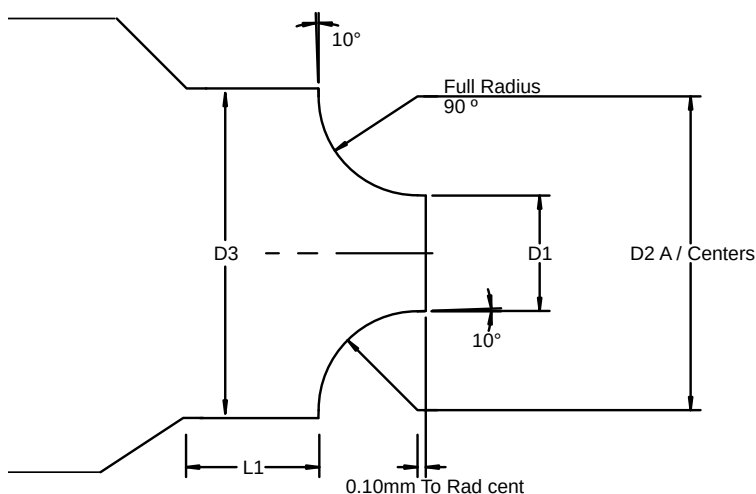
2 flute solid carbide tools with internal radius, manufactured from Ultra Wear Resistant Micrograin Carbide. includes a full 90 degree radius plus runout. Available uncoated or Cupro coated.

Application

Designed to produce an external radius in a variety of materials.

Metric Sizes (mm)

CATALOGUE No.	CATALOGUE No. Coated	SHANK DIAMETER	CORNER RADIUS	OVERALL LENGTH	PRICE UNCOATED £	PRICE COATED £
2171-3-0.2R	2171-3F-0.2R	3	0.2	38	63.84	69.09
2171-3-0.25R	2171-3F-0.25R	3	0.25	38	63.84	69.09
2171-3-0.3R	2171-3F-0.3R	3	0.3	38	63.84	69.09
2171-3-0.4R	2171-3F-0.4R	3	0.4	38	63.84	69.09
2171-3-0.5R	2171-3F-0.5R	3	0.5	38	63.84	69.09
2171-3-0.6R	2171-3F-0.6R	3	0.6	38	63.84	69.09
2171-3-0.7R	2171-3F-0.7R	3	0.7	38	63.84	69.09
2171-3-0.75R	2171-3F-0.75R	3	0.75	38	63.84	69.09
2171-3-0.8R	2171-3F-0.8R	3	0.8	38	63.84	69.09
2171-3-0.9R	2171-3F-0.9R	3	0.9	38	63.84	69.09
2171-3-1.0R	2171-3F-1.0R	3	1.0	38	63.84	69.09



CATALOGUE No.	L1	D1	D2	D3
2171-3-0.2R	2.5	0.6	1.035	1.2
2171-3-0.25R	2.5	0.5	1.035	1.2
2171-3-0.3R	2.5	0.5	1.135	1.3
2171-3-0.4R	2.5	0.5	1.335	1.5
2171-3-0.5R	2.5	0.5	1.535	1.7
2171-3-0.6R	3.0	0.5	1.735	1.9
2171-3-0.7R	3.0	0.5	1.935	2.1
2171-3-0.75R	3.0	0.5	2.035	2.2
2171-3-0.8R	4.0	0.8	2.435	2.6
2171-3-0.9R	4.0	0.8	2.635	2.8
2171-3-1.0R	N/A	0.8	2.835	3.0

4011 Series

Corner Rounding Cutter



Description

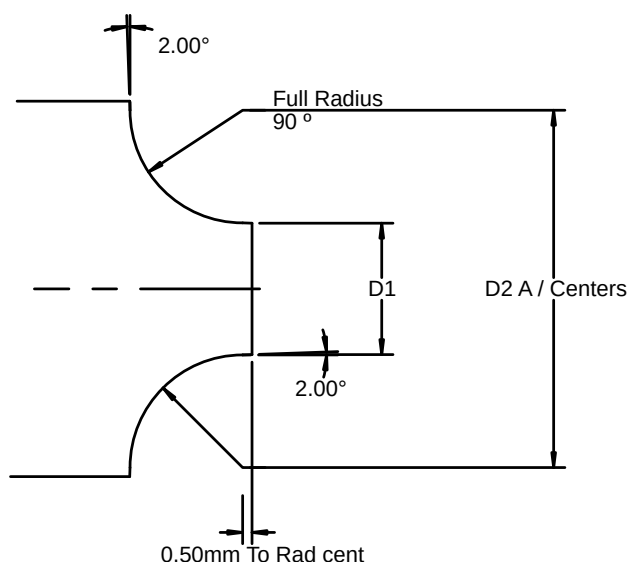
4 flute solid carbide tool with internal radius, manufactured from Ultra Wear Resistant Micrograin Carbide. Includes full 90° radius plus runout. Available uncoated or Cupro coated.

Application

Designed to produce an external radius on a variety of materials.

Metric Sizes (mm)

CATALOGUE No.	CATALOGUE No. Coated	SHANK DIAMETER	CORNER RADIUS	OVERALL LENGTH	PRICE UNCOATED £	PRICE COATED £
4011-8-0.5R	4011-8F-0.5R	8	0.5	64	73.91	84.73
4011-8-1.0R	4011-8F-1.0R	8	1.0	64	73.91	84.73
4011-10-1.5R	4011-10F-1.5R	10	1.5	70	80.23	91.05
4011-10-2.0R	4011-10F-2.0R	10	2.0	70	80.23	91.05
4011-12-2.5R	4011-12F-2.5R	12	2.5	76	86.02	95.12
4011-12-3.0R	4011-12F-3.0R	12	3.0	76	86.02	95.12
4011-16-3.5R	4011-16F-3.5R	16	3.5	89	130.69	144.29
4011-16-4.0R	4011-16F-4.0R	16	4.0	89	130.69	144.29
4011-16-4.5R	4011-16F-4.5R	16	4.5	89	130.69	144.29
4011-16-5.0R	4011-16F-5.0R	16	5.0	89	130.69	144.29
4011-20-5.5R	4011-20F-5.5R	20	5.5	100	196.03	215.31
4011-20-6.0R	4011-20F-6.0R	20	6.0	100	196.03	215.31



CATALOGUE No.	D1	D2
4011-8F-0.5R	6.00	7.035
4011-8F-1.0R	5.00	7.035
4011-10F-1.5R	6.00	9.035
4011-10F-2.0R	5.00	9.035
4011-12F-2.5R	6.00	11.035
4011-12F-3.0R	5.00	11.035
4011-16F-3.5R	8.00	15.035
4011-16F-4.0R	7.00	15.035
4011-16F-4.5R	6.00	15.035
4011-16F-5.0R	5.00	15.035
4011-20F-5.5R	8.00	19.035
4011-20F-6.0R	7.00	19.035

4071 Series

Chamfer Tool



Description

4 flute solid carbide chamfering tool, 100, 90, 82 and 60 degree inclusive angle with staggered teeth. Manufactured from Ultra Tough Micrograin Carbide. Available uncoated or Cupro coated.

Application

This tool can be used to chamfer and countersink a variety of materials. The staggered tooth design leads to smoother cutting and better surface finish.

Metric Sizes (mm)

CATALOGUE No.	CATALOGUE No. Coated	SIZE	SHANK DIAMETER	No. OF FLUTES	OVERALL LENGTH	INCLUSIVE ANGLE	PRICE UNCOATED £	PRICE COATED £
4071-4-100	4071-4F-100	4	4	4	50	100°	33.60	38.99
4071-4-90	4071-4F-90	4	4	4	50	90°	33.60	38.99
4071-4-82	4071-4F-82	4	4	4	50	82°	33.60	38.99
4071-4-60	4071-4F-60	4	4	4	50	60°	33.60	38.99
4071-5-100	4071-5F-100	5	5	4	50	100°	35.24	40.60
4071-5-90	4071-5F-90	5	5	4	50	90°	35.24	40.60
4071-5-82	4071-5F-82	5	5	4	50	82°	35.24	40.60
4071-5-60	4071-5F-60	5	5	4	50	60°	35.24	40.60
4071-6-100	4071-6F-100	6	6	4	64	100°	39.62	44.99
4071-6-90	4071-6F-90	6	6	4	64	90°	39.62	44.99
4071-6-82	4071-6F-82	6	6	4	64	82°	39.62	44.99
4071-6-60	4071-6F-60	6	6	4	64	60°	39.62	44.99
4071-8-100	4071-8F-100	8	8	4	64	100°	53.01	62.13
4071-8-90	4071-8F-90	8	8	4	64	90°	53.01	62.13
4071-8-82	4071-8F-82	8	8	4	64	82°	53.01	62.13
4071-8-60	4071-8F-60	8	8	4	64	60°	53.01	62.13
4071-10-100	4071-10F-100	10	10	4	70	100°	63.79	72.90
4071-10-90	4071-10F-90	10	10	4	70	90°	63.79	72.90
4071-10-82	4071-10F-82	10	10	4	70	82°	63.79	72.90
4071-10-60	4071-10F-60	10	10	4	70	60°	63.79	72.90
4071-12-100	4071-12F-100	12	12	4	76	100°	74.32	83.45
4071-12-90	4071-12F-90	12	12	4	76	90°	74.32	83.45
4071-12-82	4071-12F-82	12	12	4	76	82°	74.32	83.45
4071-12-60	4071-12F-60	12	12	4	76	60°	74.32	83.45

4111 Series

4 Flute Back Chamfering and Countersinking Tool



Description

4 Flute solid carbide back chamfering tool, 90° inclusive angle with staggered teeth. Manufactured from Ultra Wear Resistant Micrograin Carbide.

Application

Designed for front and back chamfering or circular interpolation countersinking of holes and slots in a variety of materials. The staggered tooth design leads to smoother cutting and improved surface finish. These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively we can make complete to your specification.

Metric Sizes (mm) Uncoated

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	NECK LENGTH	NECK DIA.	MAX CHAM	PRICE £
4111-4-90	4	6	58	3	10	3	0.5	79.65
4111-6-90	6	6	64	4	15	4	1.0	79.65
4111-8-90	8	8	64	6	20	5	1.5	96.49
4111-10-90	10	10	100	8	25	6	2.0	129.51
4111-12-90	12	12	100	9	30	7	2.5	149.78

Metric Sizes (mm)

Coated for improved tool life

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	NECK LENGTH	NECK DIA.	MAX CHAM	PRICE £
4111-4C-90	4	6	58	3	10	3	0.5	91.92
4111-6C-90	6	6	64	4	15	4	1.0	91.92
4111-8C-90	8	8	64	6	20	5	1.5	112.33
4111-10C-90	10	10	100	8	25	6	2.0	154.12
4111-12C-90	12	12	100	9	30	7	2.5	172.92

2141 Series

2 Flute Drill-Mill 90° Included Angle



Description

2 Flute Solid Carbide 90° inclusive drill point end, manufactured from Ultra Wear Resistant Micrograin Carbide. Available uncoated or Cupro coated.

Application

Multipurpose tool for milling, drilling, spotting, chamfering and countersinking.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
2141-3-90	3	3	38	8	20.46
2141-4-90	4	4	50	11	28.71
2141-5-90	5	6	58	13	35.78
2141-6-90	6	6	58	16	35.78
2141-8-90	8	8	64	22	44.56
2141-10-90	10	10	70	25	62.56
2141-12-90	12	12	84	30	84.62
2141-16-90	16	16	89	35	176.64
2141-20-90	20	20	100	45	267.80

Metric Sizes (mm)

Coated for improved tool life

CATALOGUE No.	SIZE	SHANK DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
2141-3F-90	3	3	38	8	25.82
2141-4F-90	4	4	50	11	34.06
2141-5F-90	5	6	58	13	41.13
2141-6F-90	6	6	58	16	41.13
2141-8F-90	8	8	64	22	55.38
2141-10F-90	10	10	70	25	71.66
2141-12F-90	12	12	84	30	93.73
2141-16F-90	16	16	89	35	195.71
2141-20F-90	20	20	100	45	286.87

D Series Engraving Tools

Solid Carbide 'D' Bits



Description

ITC's one D engraving tool is solid carbide and is available in three different angles; 30 Degrees, 60 Degrees and 90 Degrees inclusive. Other sizes available on request.

Application

Designed to give superior performance in general engraving.

Metric Sizes (mm)

CATALOGUE No.	INCLUDED ANGLE	DIAMETER	OVERALL LENGTH	SPLIT LENGTH	PRICE £
ENG-3.0-30	30 deg	3	38	5	16.28
ENG-6.0-30	30 deg	6	57	8	24.96
ENG-3.0-60	60 deg	3	38	5	16.28
ENG-6.0-60	60 deg	6	57	8	24.96
ENG-3.0-90	90 deg	3	38	5	16.28
ENG-6.0-90	90 deg	6	57	8	24.96

Imperial Sizes (inches)

CATALOGUE No.	INCLUDED ANGLE	DIAMETER	OVERALL LENGTH	SPLIT LENGTH	PRICE £
ENG-125-60	60 deg	1/8"	1-1/2"	3/8"	22.60
ENG-250-60	60 deg	1/4"	2-1/2"	3/8"	34.49

Engraving Tools With Flats

Metric Sizes (mm)

CATALOGUE No.	INCLUDED ANGLE	FLAT	DIAMETER	OVERALL LENGTH	SPLIT LENGTH	PRICE £
ENG-6.0-60-0.25	60 deg	0.25	6	56	8	24.58
ENG-6.0-60-0.50	60 deg	0.50	6	56	8	24.58
ENG-6.0-60-0.75	60 deg	0.75	6	56	8	24.58
ENG-6.0-60-1.0	60 deg	1.0	6	56	8	24.58
ENG-6.0-60-1.25	60 deg	1.25	6	56	8	24.58
ENG-6.0-60-1.5	60 deg	1.5	6	56	8	24.58
ENG-6.0-60-2.0	60 deg	2.0	6	56	8	24.58

N.B. These tools can be modified if you require a different size of flat to standards offered, just ring our sales office to arrange.

4001 Series

XXLS 4 Flute Square End



Description

4 flute solid carbide, straight shank, 30° right hand helix, manufactured from Ultra Wear Resistant Micrograin Carbide, available both Square End and Ball Nosed.

Application

Designed for applications requiring extremely long reach in a variety of materials.

Metric Sizes (mm)

CATALOGUE No.	SIZE	FLUTE LENGTH	OVERALL LENGTH	PRICE £
4001-6	6	38	150	68.55
4001-8	8	40	150	80.89
4001-10	10	50	200	173.04
4001-12	12	75	200	196.08
4001-16	16	75	200	285.70
4001-20	20	75	200	460.35

These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively we can make complete to your specifications.

For Speeds & Feeds please see page 99.

4002 Series

XXLS 4 Flute Ball Nose End Mills



Description

4 flute solid carbide, straight shank, 30° right hand helix, manufactured from Ultra Wear Resistant Micrograin Carbide, available both Square End and Ball Nosed.

Application

Designed for applications requiring extremely long reach in a variety of materials.

Metric Sizes (mm)

CATALOGUE No.	SIZE	FLUTE LENGTH	OVERALL LENGTH	PRICE £
4002-6	6	38	150	74.96
4002-8	8	40	150	86.03
4002-10	10	50	200	178.29
4002-12	12	75	200	222.61
4002-16	16	75	200	325.62
4002-20	20	75	200	530.22

These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively we can make complete to your specifications.

For Speeds & Feeds please see page 99.

2121 Series

XXLS 2 Flute Square End



Description

2 flute solid carbide, straight shank, 30° right hand helix, manufactured from Ultra Wear Resistant Micrograin Carbide, available both Square End and Ball Nosed.

Application

Designed for applications requiring extremely long reach in a variety of materials.

Metric Sizes (mm)

CATALOGUE No.	SIZE	FLUTE LENGTH	OVERALL LENGTH	PRICE £
2121-6	6	38	150	68.55
2121-8	8	40	150	80.89
2121-10	10	50	200	173.04
2121-12	12	75	200	196.08
2121-16	16	75	200	285.70
2121-20	20	75	200	460.35

These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively we can make complete to your specifications.

For Speeds & Feeds please see page 99.

2122 Series

XXLS 2 Flute Ball Nose End Mill



Description

2 flute solid carbide, straight shank, 30° right hand helix, manufactured from Ultra Wear Resistant Micrograin Carbide, available both Square End and Ball Nosed.

Application

Designed for applications requiring extremely long reach in a variety of materials.

Metric Sizes (mm)

CATALOGUE No.	SIZE	FLUTE LENGTH	OVERALL LENGTH	PRICE £
2122-6	6	38	150	74.96
2122-8	8	40	150	86.03
2122-10	10	50	200	178.29
2122-12	12	75	200	222.61
2122-16	16	75	200	325.62
2122-20	20	75	200	530.22

These tools can be modified to your requirements within our CNC manufacturing facility. Alternatively we can make complete to your specifications.

For Speeds & Feeds please see page 99.

4051 Series

Fine Pitch Ripper



Description

4 flute, fine pitch ripper, standard ISO length with weldon flat, M42 material. Available either uncoated or with AlTiN.

Application

ZEN series fine pitch rippers are suitable for high volume metal removal on a variety of steels and aircraft alloys. Other styles and sizes available, please enquire with our sales office for further details.

Metric Sizes (mm)

CATALOGUE No. UNCOATED	CATALOGUE No. COATED	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	No. OF FLUTES	PRICE £ UNCOATED	PRICE £ COATED
4051-6.0	4051-6.0C	6	6	13	57	3	20.92	24.32
4051-8.0	4051-8.0C	8	10	19	69	4	27.88	31.31
4051-10.0	4051-10.0C	10	10	22	72	4	34.04	37.48
4051-12.0	4051-12.0C	12	12	26	83	4	40.86	43.72
4051-16.0	4051-16.0C	16	16	32	92	4	55.36	59.21
4051-20.0	4051-20.0C	20	20	38	104	4	76.31	82.33
4051-25.0	4051-25.0C	25	25	45	121	5	109.46	119.52

3011 Series

Disposable High Performance End Mills



Description

3 flute HSS Co End Mills, Stub and Long Series, Square End or Ball Nose. Available both uncoated and AlTiN coated.

Application

Designed to give high performance at a budget price, these premium quality End Mills are suitable for most general machining applications. TiAlN coating and specially developed geometry give excellent surface finish and extended tool life.

Metric Sizes (mm)

CATALOGUE No. UNCOATED	CATALOGUE No. COATED	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	REACH	PRICE £ UNCOATED	PRICE £ COATED
3011-1.5	3011-1.5C	1.5	6	4	28	10	9.90	20.14
3011-2	3011-2C	2	6	4.5	29	11	8.55	18.71
3011-2.5	3011-2.5C	2.5	6	6.5	32	12.5	8.55	18.71
3011-3	3011-3C	3	6	7.5	34	14.5	8.55	18.71
3011-3.5	3011-3.5C	3.5	6	8.5	36.5	15	8.55	18.71
3011-4	3011-4C	4	6	9.5	39	17.5	8.55	18.71
3011-4.5	3011-4.5C	4.5	6	11	42	17.5	8.55	18.71
3011-5	3011-5C	5	6	12.5	44.5	17.5	8.55	18.71
3011-5.5	3011-5.5C	5.5	6	14.5	46	19	8.55	18.71
3011-6	3011-6C	6	6	16	44.5	20.5	8.55	18.71
3011-8	3011-8C	8	10	19	55.5	27.9	14.81	29.31
3011-10	3011-10C	10	10	22.5	61	31.6	14.81	29.31

Imperial Sizes (inches)

CATALOGUE No. UNCOATED	CATALOGUE No. COATED	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	REACH	PRICE £ UNCOATED	PRICE £ COATED
3011-0625	3011-0625C	1/16	1/4	5/32	1-3/32	13/32	9.78	19.87
3011-0781	3011-0781C	5/64	1/4	7/32	1-3/16	15/32	8.55	18.71
3011-0938	3011-0938C	3/32	1/4	1/4	1-1/4	1/2	8.55	18.71
3011-1094	3011-1094C	7/64	1/4	9/32	1-9/32	17/32	8.55	18.71
3011-1250	3011-1250C	1/8	1/4	5/16	1-11/32	9/16	8.55	18.71
3011-1406	3011-1406C	9/64	1/4	11/32	1-7/16	19/32	8.55	18.71
3011-1562	3011-1562C	5/32	1/4	3/8	1-17/32	5/8	8.55	18.71
3011-1719	3011-1719C	11/64	1/4	13/32	1-19/32	21/32	8.55	18.71
3011-1875	3011-1875C	3/16	1/4	7/16	1-21/32	11/16	8.55	18.71
3011-2031	3011-2031C	13/64	1/4	15/32	1-11/16	11/16	8.55	18.71
3011-2188	3011-2188C	7/32	1/4	1/2	1-3/4	11/16	8.55	18.71
3011-2344	3011-2344C	15/64	1/4	9/16	1-13/16	3/4	8.55	18.71
3011-2500	3011-2500C	1/4	1/4	5/8	1-3/4	13/16	8.55	18.71

3021 Series

Disposable High Performance End Mills



Description

3 flute HSS Co End Mills, Stub and Long Series, Square End or Ball Nose. Available both uncoated and AlTiN coated.

Application

Designed to give high performance at a budget price, these premium quality End Mills are suitable for most general machining applications. TiAlN coating and specially developed geometry give excellent surface finish and extended tool life.

Metric Sizes (mm)

CATALOGUE No. UNCOATED	CATALOGUE No. COATED	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	REACH	PRICE £ UNCOATED	PRICE £ COATED
3021-1.0	3021-1.0C	1	6	2	24.5	8.5	21.17	30.73
3021-1.5	3021-1.5C	1.5	6	2.5	24.5	8.5	8.94	19.19
3021-2.0	3021-2.0C	2	6	3	25.5	9.5	7.92	13.93
3021-2.5	3021-2.5C	2.5	6	4	26	10	7.92	13.93
3021-2.8	3021-2.8C	2.8	6	4.5	28	11	7.92	13.93
3021-3.0	3021-3.0C	3	6	4.5	28	11	7.92	13.93
3021-3.5	3021-3.5C	3.5	6	5.5	30	12	7.92	13.93
3021-3.8	3021-3.8C	3.8	6	6.5	32.5	12.5	7.92	13.93
3021-4.0	3021-4.0C	4	6	6.5	32.5	12.5	7.92	13.93
3021-4.5	3021-4.5C	4.5	6	7.5	36	13.5	7.92	13.93
3021-4.8	3021-4.8C	4.8	6	7.5	36	13.5	7.92	13.93
3021-5.0	3021-5.0C	5	6	7.5	36	13.5	7.92	13.93
3021-5.5	3021-5.5C	5.5	6	7.5	36	13.5	7.92	13.93
3021-5.75	3021-5.75C	5.75	6	9.5	36	15	7.92	13.93
3021-6.0	3021-6.0C	6	6	9.5	36	15	7.92	13.93
3021-7.0	3021-7.0C	7	10	10.5	46	19.7	13.93	28.56
3021-8.0	3021-8.0C	8	10	11	47.5	19.7	13.93	28.56
3021-9.0	3021-9.0C	9	10	13	51	20.5	13.93	28.56
3021-10	3021-10C	10	10	13	51.5	20.5	13.93	28.56
3021-12	3021-12C	12	12	26	70	39	18.17	35.24

Imperial Sizes (inches)

CATALOGUE No. UNCOATED	CATALOGUE No. COATED	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	REACH	PRICE £ UNCOATED	PRICE £ COATED
3021-0625	3021-0625C	1/16	1/4	3/32	31/32	11/32	8.94	19.19
3021-0938	3021-0938C	3/32	1/4	5/32	1-1/64	24/64	7.92	18.24
3021-1250	3021-1250C	1/8	1/4	3/16	1-3/32	7/16	7.92	18.24
3021-1562	3021-1562C	5/32	1/4	1/4	1-9/32	1/2	7.92	18.24
3021-1875	3021-1875C	3/16	1/4	9/32	1-11/32	17/32	7.92	18.24
3021-2188	3021-2188C	7/32	1/4	5/16	1-13/32	17/32	7.92	18.24
3021-2500	3021-2500C	1/4	1/4	3/8	1-13/32	19/32	7.92	18.24
3021-3125	3021-3125C	5/16	3/8	3/4	2-3/4	1.3/16	16.54	31.34
3021-3750	3021-3750C	3/8	3/8	7/8	2-3/4	1.3/16	16.54	31.34
3021-5000	3021-5000C	1/2	1/2	1.1/2	3-1/2	1.23/32	23.01	39.21

3002 Series

Disposable High Performance End Mills



Description

3 flute HSS Co End Mills, Stub and Long Series, Square End or Ball Nose. Available both uncoated and AlTiN coated.

Application

Designed to give high performance at a budget price, these premium quality End Mills are suitable for most general machining applications. TiAlN coating and specially developed geometry give excellent surface finish and extended tool life.

Metric Sizes (mm)

CATALOGUE No. UNCOATED	CATALOGUE No. COATED	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	REACH	PRICE £ UNCOATED	PRICE £ COATED
3002-2.0	3002-2.0C	2	6	4.5	31.5	11	10.86	20.90
3002-2.5	3002-2.5C	2.5	6	6.5	35	12.5	10.86	20.90
3002-3.0	3002-3.0C	3	6	7.5	34	14.5	10.86	20.90
3002-4.0	3002-4.0C	4	6	9.5	39	16	10.86	20.90
3002-5.0	3002-5.0C	5	6	12.5	44.5	17.5	10.86	20.90
3002-6.0	3002-6.0C	6	6	16	44.5	20.5	10.86	20.90

Imperial Sizes (inches)

CATALOGUE No. UNCOATED	CATALOGUE No. COATED	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	REACH	PRICE £ UNCOATED	PRICE £ COATED
3002-0625	3002-0625C	1/16	1/4	1/4	1-1/4	7/16	11.94	21.92
3002-0938	3002-0938C	3/32	1/4	3/16	1-3/8	1/2	10.86	20.90
3002-1250	3002-1250C	1/8	1/4	5/16	1-11/32	9/16	10.86	20.90
3002-1562	3002-1562C	5/32	1/4	3/8	1-17/32	5/8	10.86	20.90
3002-1875	3002-1875C	3/16	1/4	7/16	1-21/32	11/16	10.86	20.90
3002-2188	3002-2188C	7/32	1/4	1/2	1-3/4	11/16	10.86	20.90
3002-2500	3002-2500C	1/4	1/4	5/8	1-3/4	13/16	10.86	20.90

Milling Speeds and feeds

Solid Carbide - Coated

MATERIAL GROUP	TIN	TICN	TIALN	HARDNESS (Bhn)	SURFACE SPEED METRES/MIN	FEED (mm/TOOTH) END MILL DIAMETER									
						3mm	4mm	5mm	6mm	8mm	10mm	12mm	16mm	20mm	25mm
Aluminium Low <8% Silicon	3	1	2	-	max avail.	0.02	0.03	0.04	0.06	0.07	0.10	0.15	0.15	0.20	0.20
Aluminium High >8% Silicon	3	1	2	-	200-600	0.02	0.02	0.03	0.05	0.06	0.10	0.10	0.10	0.15	0.15
Brass and Bronze	1	2	3	-	80-365	0.02	0.02	0.03	0.04	0.05	0.07	0.08	0.09	0.10	0.10
Copper and Copper Alloys	1	2	3	-	130-330	0.03	0.04	0.04	0.05	0.06	0.07	0.09	0.09	0.10	0.10
Cast Iron (Soft)	3	1	2	120-200	100-225	0.03	0.03	0.04	0.05	0.06	0.07	0.07	0.08	0.09	0.10
Cast Iron (Hard)	3	1	2	210-320	60-120	0.02	0.03	0.03	0.04	0.05	0.05	0.05	0.06	0.08	0.10
Low Carbon Steels	3	1	2	100-200	100-240	0.02	0.03	0.03	0.05	0.05	0.06	0.07	0.08	0.08	0.10
Medium Carbon Steels	3	2	1	175-425	60-100	0.15	0.02	0.04	0.04	0.04	0.05	0.05	0.06	0.10	0.10
Hardened Steels	3	2	1	45Rc-60Rc	30-60	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.06
Tool Steel	1	2	3	100-250	30-100	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.06	0.08
Stainless Steel Soft (300 series)	3	2	1	< 275	60-120	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.08
Stainless Steel Hard (400 series)	1	2	3	< 275	90-180	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.06	0.07	0.08
Stainless Steel (PH)	2	3	1	< 325	80-175	0.02	0.02	0.03	0.05	0.05	0.06	0.06	0.07	0.07	0.08
Titanium (Soft)	3	2	1	110-275	60-105	0.01	0.02	0.02	0.04	0.04	0.05	0.05	0.06	0.06	0.07
Titanium (Hard)	3	2	1	300-440	30-60	0.01	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08
Monel/High Nickel Steels	3	2	1	-	60-80	0.01	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.08	0.10
Hi-Temperature Alloys	3	2	1	-	15-35	0.01	0.02	0.02	0.02	0.03	0.04	0.04	0.05	0.06	0.07

Coating 1 - First Choice
2 - Second Choice
3 - Third Choice

Solid Carbide - Uncoated

MATERIAL GROUP	HARDNESS (Bhn)	SURFACE SPEED METRES/MIN	FEED (mm/TOOTH) END MILL DIAMETER									
			3mm	4mm	5mm	6mm	8mm	10mm	12mm	16mm	20mm	25mm
Aluminium Low <8% Silicon	-	max avail.	0.013	0.025	0.035	0.050	0.070	0.080	0.100	0.120	0.150	0.200
Aluminium High >8% Silicon	-	200-400	0.013	0.025	0.030	0.040	0.060	0.070	0.080	0.100	0.120	0.150
Brass and Bronze	-	70-120	0.025	0.030	0.040	0.050	0.060	0.070	0.075	0.090	0.100	0.150
Copper and Copper Alloys	-	120-250	0.025	0.030	0.040	0.050	0.060	0.070	0.075	0.090	0.100	0.150
Cast Iron (Soft)	120-200	70-180	0.025	0.030	0.040	0.050	0.060	0.070	0.075	0.120	0.150	0.020
Cast Iron (Hard)	120-200	30-90	0.010	0.140	0.017	0.020	0.030	0.040	0.050	0.060	0.075	0.100
Magnesium and Magnesium Alloys	-	300-460	0.025	0.030	0.040	0.050	0.070	0.080	0.100	0.130	0.150	0.250
Plastics-Glass Filled	-	100-185	0.038	0.045	0.055	0.076	0.090	0.095	0.100	0.130	0.150	0.300
Plastics	-	240-490	0.038	0.050	0.070	0.080	0.110	0.130	0.150	0.200	0.250	0.380
Low Carbon Steels	-	70-125	0.013	0.017	0.020	0.025	0.040	0.060	0.075	0.100	0.150	0.180
Medium Carbon Steels	275-425	35-90	0.015	0.020	0.030	0.040	0.043	0.047	0.050	0.075	0.100	0.150
Hardened Steels	48-52 Rc "C"	9-30	0.005	0.007	0.010	0.013	0.017	0.020	0.025	0.035	0.050	0.075
Stainless Steel Soft (300 series)	135-275	60-125	0.013	0.017	0.020	0.025	0.035	0.040	0.050	0.075	0.010	0.150
Stainless Steel Hard (400 series)	135-275	18-80	0.005	0.007	0.010	0.013	0.017	0.020	0.025	0.050	0.075	0.130
Titanium (Soft)	-	15-125	0.013	0.017	0.020	0.025	0.030	0.040	0.050	0.075	0.100	0.150
Titanium (Hard)	-	15-60	0.007	0.100	0.012	0.015	0.020	0.022	0.025	0.035	0.050	0.100
Monel/High Nickel Steels	-	45-75	0.013	0.017	0.020	0.025	0.031	0.040	0.050	0.060	0.076	0.100
Hi-Temperature Alloys	-	8-30	0.010	0.014	0.017	0.020	0.022	0.023	0.025	0.030	0.035	0.050

164-27 Series

2 Flute Miniature End Mills



Description

2 flute, solid carbide, single end, standard length, square end, straight shank, 30° right hand helix, right hand cut, centre cutting.

Application

Designed for precision machining in applications where a particularly small tool is required. The common shank size provides rigidity and the flute design gives sufficient swarf clearance for slotting applications.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
164-0002-27	0.2	3	0.6	38	62.87
164-0003-27	0.3	3	0.9	38	45.25
164-0004-27	0.4	3	1.2	38	32.23
164-0005-27	0.5	3	1.5	38	32.23
164-0006-27	0.6	3	1.8	38	32.23
164-0007-27	0.7	3	2.1	38	32.23
164-0008-27	0.8	3	2.4	38	27.78
164-0009-27	0.9	3	2.7	38	27.78
164-0010-27	1.0	3	3.0	38	27.78
164-0011-27	1.1	3	3.3	38	27.78
164-0012-27	1.2	3	3.6	38	27.78
164-0013-27	1.3	3	3.9	38	27.78
164-0014-27	1.4	3	4.2	38	27.78
164-0015-27	1.5	3	4.5	38	22.19
164-0016-27	1.6	3	4.8	38	22.19
164-0017-27	1.7	3	5.1	38	22.19
164-0018-27	1.8	3	5.4	38	22.19
164-0019-27	1.9	3	5.7	38	22.19
164-0020-27	2.0	3	6.0	38	19.49

For Speeds & Feeds please see page99.

164-27ST Series

2 Flute Single End Miniature Stub End Mills



Description

2 flute, solid carbide, single end, stub length, square end, straight shank, 30° right hand helix, right hand cut, centre cutting.

Application

Suitable for applications where the standard length tool may lack rigidity. Flute length is typically half that of the standard tool.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
164-0002-27ST	0.2	3	0.4	38	59.87
164-0003-27ST	0.3	3	0.6	38	43.13
164-0004-27ST	0.4	3	0.8	38	30.65
164-0005-27ST	0.5	3	1.0	38	30.65
164-0006-27ST	0.6	3	1.2	38	30.65
164-0007-27ST	0.7	3	1.4	38	30.65
164-0008-27ST	0.8	3	1.6	38	23.64
164-0009-27ST	0.9	3	1.8	38	23.64
164-0010-27ST	1.0	3	2.0	38	23.64
164-0011-27ST	1.1	3	2.2	38	23.64
164-0012-27ST	1.2	3	2.4	38	23.64
164-0013-27ST	1.3	3	2.6	38	23.64
164-0014-27ST	1.4	3	2.8	38	23.64
164-0015-27ST	1.5	3	3.0	38	18.90
164-0016-27ST	1.6	3	3.2	38	18.90
164-0017-27ST	1.7	3	3.4	38	18.90
164-0018-27ST	1.8	3	3.6	38	18.90
164-0019-27ST	1.9	3	3.8	38	18.90
164-0020-27ST	2.0	3	4.0	38	16.91

For Speeds & Feeds please see page 99.

164-47 Series

4 Flute Miniature End Mills



Description

4 flute, solid carbide, single end, standard length, square end, straight shank, 30° right hand helix, right hand cut, centre cutting.

• Four flute end mills 0.3mm diameter and smaller are non-centre cutting.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
164-0002-47	0.2	3	0.6	38	62.87
164-0003-47	0.3	3	0.9	38	45.25
164-0004-47	0.4	3	1.2	38	18.90
164-0005-47	0.5	3	1.5	38	18.90
164-0006-47	0.6	3	1.8	38	18.90
164-0007-47	0.7	3	2.1	38	18.90
164-0008-47	0.8	3	2.4	38	27.78
164-0009-47	0.9	3	2.7	38	27.78
164-0010-47	1.0	3	3.0	38	27.78
164-0011-47	1.1	3	3.3	38	27.78
164-0012-47	1.2	3	3.6	38	27.78
164-0013-47	1.3	3	3.9	38	27.78
164-0014-47	1.4	3	4.2	38	27.78
164-0015-47	1.5	3	4.5	38	22.19
164-0016-47	1.6	3	4.8	38	22.19
164-0017-47	1.7	3	5.1	38	22.19
164-0018-47	1.8	3	5.4	38	22.19
164-0019-47	1.9	3	5.7	38	22.19
164-0020-47	2.0	3	6.0	38	19.49

For Speeds & Feeds please see page 99.

155-24 Series

2 Flute Ball Nose Miniature End Mill



Description

2 flute, solid carbide, single end, standard length, ball nose, straight shank, 30° right hand helix, centre cutting.

Application

Similar to square end tool, but with the added advantage of suitability to mill contoured surfaces.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
155-0003-24	0.3	3	0.5	38	56.06
155-0004-24	0.4	3	0.6	38	56.06
155-0005-24	0.5	3	0.8	38	39.95
155-0006-24	0.6	3	0.9	38	39.95
155-0007-24	0.7	3	1.1	38	38.24
155-0008-24	0.8	3	1.2	38	38.24
155-0009-24	0.9	3	1.4	38	38.24
155-0010-24	1.0	3	1.5	38	36.95
155-0011-24	1.1	3	1.7	38	36.95
155-0012-24	1.2	3	1.8	38	36.95
155-0013-24	1.3	3	2.0	38	36.95
155-0014-24	1.4	3	2.1	38	36.95
155-0015-24	1.5	3	2.3	38	36.95
155-0016-24	1.6	3	2.4	38	36.95
155-0018-24	1.8	3	2.7	38	36.95
155-0020-24	2.0	3	3.0	38	36.95

For Speeds & Feeds please see page 99.

155-24 Series

2 Flute Ball Nose



Description

2 flute solid carbide, single end, standard length, ball nose, straight shank, 30° right hand helix, centre cutting.

Application

Similar to square end, but with the added advantage of suitability to mill contoured surfaces.

Metric Sizes (mm)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
155-2123-24		1	3	2	38	21.71
155-2323-24		1.5	3	2.3	38	24.93
155-2523-24	M30831	2	3	7	38	20.40
155-2913-24	M30832	2.5	3	7	38	20.40
155-3373-24	M30840	3	3	9	38	20.40
155-3573-24	M30841	3.5	4	12	51	26.68
155-4013-24	M39951	4	4	14	51	26.94
155-4363-24	M30850	4.5	5	14	51	31.61
155-4763-24	M30851	5	5	16	51	31.61
155-5373-24	M39952	6	6	19	64	40.30
155-5893-24	M30860	7	8	19	64	42.83
155-6283-24	M30861	8	8	21	64	46.99
155-6633-24	M30862	9	10	22	70	71.14
155-6973-24	M30870	10	10	22	76	72.08
155-7233-24	M30871	11	11	25	70	83.72
155-7363-24	M30872	12	12	25	76	104.89
155-7623-24	M30880	14	14	30	89	152.31
155-7873-24	M30881	16	16	32	89	164.38
155-8123-24	M30882	18	18	35	102	230.48
155-8373-24	M30890	20	20	38	102	289.00
155-8573-24	M30891	22	22	38	102	389.96
155-8773-24	M30892	25	25	38	102	453.86

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
155-2153-24	M30600	1/16	1/8	3/16	1-1/2	19.48
155-2803-24	M30610	3/32	1/8	3/8	1-1/2	19.48
155-3453-24	M30620	1/8	1/8	1/2	1-1/2	19.48
155-3953-24	M30632	5/32	3/16	9/16	2	26.50
155-4553-24	M30642	3/16	3/16	5/8	2	27.18
155-5153-24	M30660	7/32	1/4	5/8	2-1/2	33.43
155-5553-24	M30670	1/4	1/4	3/4	2-1/2	36.91
155-6003-24	M30672	9/32	5/16	3/4	2-1/2	39.31
155-6253-24	M30681	5/16	5/16	13/16	2-1/2	43.17
155-6803-24	M30692	3/8	3/8	7/8	2-1/2	53.50
155-7253-24		7/16	7/16	1	2-1/2	73.55
155-7453-24	M30721	1/2	1/2	1	3	90.93
155-7653-24		9/16	9/16	1-1/8	3-1/2	149.80
155-7853-24	M30741	5/8	5/8	1-1/4	3-1/2	165.95
155-8053-24		11/16	3/4	1-3/8	4	245.06
155-8253-24	M30751	3/4	3/4	1-1/2	4	215.62
155-8653-24	M30730	7/8	7/8	1-1/2	4	418.17
155-9053-24	M30762	1	1	1-1/2	4	369.46

155-27 Series

2 Flute Square End Mill



Description

2 flute, solid carbide, single end, standard length, square end, straight shank, 30° right hand helix, right hand cut, centre cutting.

Application

A general purpose end mill designed with maximum chip clearance. The two flute construction is a multi-purpose tool that can successfully be used to plunge cut. In addition to peripheral milling, the large flute volume allows it to be buried in the cut as in slotting applications. It is usually the most economical tool in milling cast irons, non-ferrous light metals, and plastics.

Metric Sizes (mm)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
155-2123-27	M31870	1	3	3	38	17.84
155-2323-27	M31872	1.5	3	5	38	17.84
155-2523-27	M31880	2	3	7	38	15.37
155-2913-27	M31881	2.5	3	7	38	15.37
155-3373-27	M31882	3	3	9	38	15.37
155-3573-27	M31890	3.5	4	12	51	20.58
155-4013-27	M39961	4	4	14	51	20.76
155-4363-27	M39962	4.5	5	14	51	25.33
155-4763-27	M39963	5	5	16	51	25.33
155-5373-27	M39971	6	6	19	64	29.88
155-5893-27	M31902	7	8	19	64	36.31
155-6283-27	M31910	8	8	21	64	39.94
155-6633-27	M31911	9	10	22	70	52.72
155-6973-27	M31912	10	10	22	76	55.50
155-7233-27	M31920	11	11	25	70	62.64
155-7363-27	M31921	12	12	25	76	75.11
155-7623-27	M31922	14	14	30	89	105.97
155-7873-27	M31930	16	16	32	89	117.31
155-8123-27	M31931	18	18	35	102	170.04
155-8373-27	M31932	20	20	38	102	219.25
155-8573-27	M31940	22	22	38	102	286.21
155-8773-27	M31941	25	25	38	102	318.99

For Speeds & Feeds please see page 99.

155-27 Series

Continued

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
155-1303-27		1/32	1/8	5/64	1-1/2	20.50
155-1953-27		3/64	1/8	9/64	1-1/2	17.84
155-2153-27	M30910	1/16	1/8	3/16	1-1/2	15.71
155-2453-27	M30912	5/64	1/8	1/4	1-1/2	16.76
155-2803-27	M30921	3/32	1/8	3/8	1-1/2	15.71
155-3153-27	M30930	7/64	1/8	3/8	1-1/2	22.15
155-3453-27	M30932	1/8	1/8	1/2	1-1/2	15.71
155-3653-27	M30942	9/64	3/16	1/2	2	22.15
155-3953-27	M30951	5/32	3/16	9/16	2	21.79
155-4253-27	M30952	11/64	3/16	9/16	2	29.78
155-4553-27	M30961	3/16	3/16	5/8	2	21.97
155-4903-27	M30971	13/64	1/4	5/8	2-1/2	27.89
155-5153-27	M30980	7/32	1/4	5/8	2-1/2	26.94
155-5553-27	M30990	1/4	1/4	3/4	2-1/2	30.21
155-6003-27	M31001	9/32	5/16	3/4	2-1/2	33.43
155-6253-27	M31012	5/16	5/16	13/16	2-1/2	34.65
155-6553-27	M31030	11/32	3/8	7/8	2-1/2	41.28
155-6803-27	M31040	3/8	3/8	7/8	2-1/2	44.37
155-7103-27	M31051	13/32	7/16	1	2-1/2	61.24
155-7253-27		7/16	7/16	1	2-1/2	60.43
155-7453-27	M31081	1/2	1/2	1	3	71.73
155-7653-27		9/16	9/16	1-1/8	3-1/2	109.13
155-7853-27	M31112	5/8	5/8	1-1/4	3-1/2	118.93
155-8053-27		11/16	3/4	1-3/8	4	179.28
155-8253-27	M31131	3/4	3/4	1-1/2	4	172.47
155-8653-27	M31142	7/8	7/8	1-1/2	4	350.87
155-9053-27	M31151	1	1	1-1/2	4	309.74

155-34 Series

3 Flute Ball Nose End Mill



Description

3 flute, solid carbide, single end, standard length, ball nose, straight shank, 30° right hand helix, centre cutting.

Application

Similar to square end, but with the added advantage of suitability to mill contoured surfaces. More rigid than 2 flute tool.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
155-2123-34	1	3	3	38	30.97
155-2323-34	1.5	3	5	38	24.93
155-2523-34	2	3	9	38	24.93
155-2913-34	2.5	3	12	38	24.93
155-3373-34	3	3	12	38	24.93
155-3573-34	3.5	4	12	51	28.71
155-4013-34	4	4	14	51	30.51
155-4763-34	5	5	20	51	31.61
155-5373-34	6	6	20	64	39.91
155-5893-34	7	8	20	64	42.40
155-6283-34	8	8	21	64	46.99
155-6633-34	9	10	22	64	71.14
155-6973-34	10	10	25	70	72.84
155-7233-34	11	11	25	70	83.72
155-7363-34	12	12	25	76	104.89
155-7623-34	14	14	30	89	150.85
155-7873-34	16	16	30	89	164.38
155-8123-34	18	18	35	102	230.48
155-8373-34	20	20	38	102	289.00

For Speeds & Feeds please see page 99.

155-37 Series

3 Flute Square End Mill



Description

3 flute, solid carbide, single end, standard length, square end, straight shank, 30° right hand helix, centre cutting.

Application

An all purpose end mill that provides a good compromise between the swarf clearance of a 2 flute slot drill and the rigidity and wear resistant properties of a 4 flute tool. The 3 flute design is ideally suited for slotting applications.

Metric Sizes (mm)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
155-2123-37	M32681	1	3	3	38	17.84
155-2323-37	M32682	1.5	3	5	38	17.84
155-2523-37	M32690	2	3	7	38	15.37
155-2913-37	M32691	2.5	3	7	38	15.37
155-3373-37	M32692	3	3	9	38	15.37
155-3573-37	M32700	3.5	4	12	51	20.58
155-4013-37	M32701	4	4	14	51	20.76
155-4363-37	M32702	4.5	5	14	51	25.33
155-4763-37	M32710	5	5	16	51	25.33
155-5373-37	M32711	6	6	19	64	29.88
155-5893-37	M32712	7	8	19	64	36.31
155-6283-37	M32720	8	8	21	64	39.94
155-6633-37	M32721	9	10	22	70	52.72
155-6973-37	M32722	10	10	22	70	55.50
155-7233-37	M32730	11	11	25	70	62.64
155-7363-37	M32731	12	12	25	76	75.11
155-7623-37	M32732	14	14	30	89	105.97
155-7873-37	M32740	16	16	32	89	117.31
155-8123-37	M32741	18	18	35	102	170.04
155-8373-37	M32742	20	20	38	102	219.25

155-37 Series

Continued

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
155-2153-37	M32191	1/16	1/8	3/16	1-1/2	15.71
155-2803-37	M32192	3/32	1/8	3/8	1-1/2	15.71
155-3453-37	M32200	1/8	1/8	1/2	1-1/2	15.71
155-3953-37	M32201	5/32	3/16	9/16	2	21.79
155-4553-37	M32202	3/16	3/16	5/8	2	21.79
155-5153-37	M32210	7/32	1/4	5/8	2-1/2	26.94
155-5553-37	M32211	1/4	1/4	3/4	2-1/2	30.21
155-6003-37	M32212	9/32	5/16	3/4	2-1/2	33.43
155-6253-37	M32220	5/16	5/16	13/16	2-1/2	34.65
155-6803-37	M32222	3/8	3/8	7/8	2-1/2	44.37
155-7253-37	M32240	7/16	7/16	1	2-1/2	60.43
155-7453-37	M32242	1/2	1/2	1	3	71.73
155-7653-37	M32251	9/16	9/16	1-1/8	3-1/2	109.13
155-7853-37	M32252	5/8	5/8	1-1/4	3-1/2	118.93
155-8053-37		11/16	3/4	1-3/8	4	176.28
155-8253-37	M32271	3/4	3/4	1-1/2	4	172.47
155-9053-37	M32281	1	1	1-1/2	4	309.74

For Speeds & Feeds please see page 99.

155-44 Series

4 Flute Ball Nose End Mill



Description

4 flute, solid carbide, single end, standard length, ball nose, straight shank, 30° right hand helix, centre cutting.

Application

A versatile tool which can be used to contour most materials, although more commonly used on steels and more difficult to machine materials. More rigid than 2 and 3 flute tools.

Metric Sizes (mm)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
155-2523-44	M33310	2	3	7	38	20.40
155-2913-44	M33311	2.5	3	7	38	20.40
155-3373-44	M33312	3	3	9	38	20.40
155-3573-44	M33320	3.5	4	12	51	26.94
155-4013-44	M39972	4	4	14	51	26.94
155-4363-44	M33322	4.5	5	14	51	31.61
155-4763-44	M33330	5	5	16	51	31.61
155-5373-44	M39980	6	6	19	64	40.30
155-5893-44	M33332	7	8	19	64	42.83
155-6283-44	M33340	8	8	21	64	46.99
155-6633-44	M33341	9	10	22	70	71.14
155-6973-44	M33342	10	10	22	76	72.08
155-7233-44	M33350	11	11	25	70	83.72
155-7363-44	M33351	12	12	25	76	104.89
155-7623-44	M33352	14	14	30	89	152.31
155-7873-44	M33360	16	16	32	89	164.38
155-8123-44		18	18	35	102	230.48
155-8373-44	M33362	20	20	38	102	289.00
155-8573-44		22	22	38	102	389.96
155-8773-44	M33371	25	25	38	102	453.86

For Speeds & Feeds please see page 99.

155-44 Series

Continued

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
155-2153-44	M33072	1/16	1/8	3/16	1-1/2	19.48
155-2803-44	M33082	3/32	1/8	3/8	1-1/2	19.48
155-3453-44	M33092	1/8	1/8	1/2	1-1/2	19.48
155-3953-44	M33110	5/32	3/16	9/16	2	26.50
155-4553-44	M33120	3/16	3/16	5/8	2	27.18
155-5153-44	M33131	7/32	1/4	5/8	2-1/2	33.43
155-5553-44	M33141	1/4	1/4	3/4	2-1/2	36.91
155-6003-44	M33150	9/32	5/16	3/4	2-1/2	39.31
155-6253-44	M33152	5/16	5/16	13/16	2-1/2	43.17
155-6803-44	M33170	3/8	3/8	7/8	2-1/2	53.50
155-7253-44		7/16	7/16	1	2-1/2	73.55
155-7453-44	M33192	1/2	1/2	1	3	90.93
155-7653-44	M33750	9/16	9/16	1-1/8	3-1/2	149.80
155-7853-44	M33212	5/8	5/8	1-1/4	3-1/2	165.95
155-8053-44		11/16	3/4	1-3/8	4	245.06
155-8253-44	M33222	3/4	3/4	1-1/2	4	215.62
155-8653-44		7/8	7/8	1-1/2	4	418.17
155-9053-44	M33241	1	1	1-1/2	4	369.46

155-47 Series

4 Flute Square End Mill



Description

4 flute, solid carbide, single end, standard length, square end, straight shank, 30° right hand helix, centre cutting.

Application

A general purpose end mill most commonly used on more difficult to machine materials than its 2 and 3 flute counterparts. More rigidity results in minimal deflection.

Metric Sizes (mm)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
155-2123-47	M33810	1	3	3	38	17.84
155-2323-47	M33811	1.5	3	5	38	17.84
155-2523-47	M33812	2	3	7	38	15.37
155-2913-47	M33820	2.5	3	7	38	15.37
155-3373-47	M33821	3	3	9	38	15.37
155-3573-47	M33822	3.5	4	12	51	20.58
155-4013-47	M39982	4	4	14	51	20.76
155-4363-47	M39990	4.5	5	14	51	25.33
155-4763-47	M39991	5	5	16	51	25.33
155-5373-47	M39992	6	6	19	64	29.88
155-5893-47	M33841	7	8	19	64	36.31
155-6283-47	M33842	8	8	21	64	39.94
155-6633-47	M33850	9	10	22	70	52.72
155-6973-47	M33851	10	10	22	76	54.79
155-7233-47	M33852	11	11	25	70	62.64
155-7363-47	M33860	12	12	25	76	75.11
155-7623-47	M33861	14	14	30	89	105.97
155-7873-47	M33862	16	16	32	89	117.31
155-8123-47	M33870	18	18	35	102	170.04
155-8373-47	M33871	20	20	38	102	217.15
155-8573-47	M33872	22	22	38	102	288.99
155-8773-47	M33880	25	25	38	102	315.92

155-47 Series

Continued

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
155-1303-47	M33380	1/32	1/8	5/64	1-1/2	20.50
155-1953-47		3/64	1/8	9/64	1-1/2	17.84
155-2153-47	M33390	1/16	1/8	3/16	1-1/2	15.71
155-2453-47	M33392	5/64	1/8	1/4	1-1/2	16.76
155-2803-47	M33401	3/32	1/8	3/8	1-1/2	15.71
155-3153-47	M33410	7/64	1/8	3/8	1-1/2	22.15
155-3453-47	M33412	1/8	1/8	1/2	1-1/2	15.71
155-3653-47	M33422	9/64	3/16	1/2	2	22.15
155-3953-47	M33431	5/32	3/16	9/16	2	21.79
155-4253-47	M33432	11/64	3/16	9/16	2	29.78
155-4553-47	M33441	3/16	3/16	5/8	2	21.97
155-4903-47	M33451	13/64	1/4	5/8	2-1/2	27.89
155-5153-47	M33460	7/32	1/4	5/8	2-1/2	26.94
155-5353-47	M33462	15/64	1/4	3/4	2-1/2	29.40
155-5553-47	M33471	1/4	1/4	3/4	2-1/2	30.21
155-5753-47	M33490	17/64	5/16	3/4	2-1/2	31.87
155-6003-47	M33491	9/32	5/16	3/4	2-1/2	33.43
155-6153-47	M33492	19/64	5/16	13/16	2-1/2	35.12
155-6253-47	M33742	5/16	5/16	13/16	2-1/2	34.65
155-6043-47	M33511	21/64	3/8	1	2-1/2	44.91
155-6553-47	M33512	11/32	3/8	1	2-1/2	41.69
155-6703-47	M33520	23/64	3/8	1	2-1/2	44.37
155-6803-47	M33522	3/8	3/8	7/8	2-1/2	44.37
155-6953-47	M33541	25/64	7/16	1	2-1/2	61.83
155-7103-47	M33542	13/32	7/16	1	2-1/2	61.24
155-7203-47	M33550	27/64	7/16	1	2-1/2	61.83
155-7253-47	M33560	7/16	7/16	1	2-1/2	60.43
155-7303-47	M33561	29/64	1/2	1	3	79.28
155-7353-47		15/32	1/2	1	3	71.15
155-7403-47	M31175	31/64	1/2	1	3	71.27
155-7453-47	M33572	1/2	1/2	1	3	71.73
155-7653-47	M33751	9/16	9/16	1-1/8	3-1/2	109.13
155-7853-47	M33602	5/8	5/8	1-1/4	3-1/2	118.93
155-8053-47	M33612	11/16	3/4	1-3/8	4	176.28
155-8253-47	M33621	3/4	3/4	1-1/2	4	172.47
155-8653-47	M33640	7/8	7/8	1-1/2	4	350.87
155-9053-47	M33650	1	1	1-1/2	4	309.74

For Speeds & Feeds please see page 99.

155-27/155-37/155-47 Series

2, 3 & 4 Flute Square End With Radius



Description

Solid carbide, single end, standard length, square end, straight shank, 30° right hand helix, centre cutting, supplied with corner radius.

Application

In many industries, especially aerospace, corner radii are required to avoid stress points. These pages list the most popular tools which our customers request. The majority are available ex-stock. Other sizes and designs can be supplied on request from our CNC modification facility.

2 Flute Tools - Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	No. OF FLUTES	RADIUS	PRICE £
155-6283-27-0.8R	8	8	21	64	2	0.8	57.68
155-6283-27-1.0R	8	8	21	64	2	1.0	57.68
155-6973-27-0.5R	10	10	22	76	2	0.5	73.17
155-6973-27-0.8R	10	10	22	76	2	0.8	73.17
155-8123-27-2.4R	18	18	25	102	2	2.4	183.60

3 Flute Tools - Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	No. OF FLUTES	RADIUS	PRICE £
155-2913-37-0.5R	2.5	3	7	38	3	0.5	24.19
155-4013-37-0.9R	4	4	14	51	3	0.9	35.54
155-4763-37-0.8R	5	5	16	51	3	0.8	40.14
155-4763-37-2.0R	5	5	16	51	3	2.0	46.03
155-5373-37-0.8R	6	6	19	64	3	0.8	44.62
155-5373-37-2.0R	6	6	19	64	3	2.0	53.50
155-6283-37-2.5R	8	8	21	64	3	2.5	60.78
155-7623-37-0.5R	14	14	30	89	3	0.5	117.73

For Speeds & Feeds please see page 99.

155-27/155-37/155-47 Series

2, 3 & 4 Flute Square End With Radius

4 Flute Tools

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	No. OF FLUTES	RADIUS	PRICE £
155-3453-47-.02R	1/8"	1/8"	1/2"	1-1/2"	4	0.020"	27.65
155-3573-47-0.8R	3.5mm	4mm	12mm	51mm	4	0.8mm	33.55
155-4013-47-0.4R	4mm	4mm	14mm	51mm	4	0.4mm	35.54
155-4013-47-0.8R	4mm	4mm	14mm	51mm	4	0.8mm	35.54
155-4013-47-1.2R	4mm	4mm	14mm	51mm	4	1.2mm	35.54
155-4763-47-0.5R	5mm	5mm	16mm	51mm	4	0.5mm	40.14
155-5373-47-.25R	6mm	6mm	19mm	64mm	4	0.25mm	44.62
155-5373-47-0.5R	6mm	6mm	19mm	64mm	4	0.5mm	44.62
155-5373-47-0.8R	6mm	6mm	19mm	64mm	4	0.8mm	44.62
155-5373-47-1.2R	6mm	6mm	19mm	64mm	4	1.2mm	44.62
155-6283-47-0.3R	8mm	8mm	21mm	64mm	4	0.3mm	57.68
155-6283-47-0.4R	8mm	8mm	21mm	64mm	4	0.4mm	57.68
155-6283-47-0.8R	8mm	8mm	21mm	64mm	4	0.8mm	57.68
155-6283-47-1.0R	8mm	8mm	21mm	64mm	4	1.0mm	57.68
155-6283-47-1.2R	8mm	8mm	21mm	64mm	4	1.2mm	57.68
155-6803-47-.02R	3/8"	3/8"	7/8"	2-1/2"	4	0.020"	57.68
155-6803-47-.05R	3/8"	3/8"	7/8"	2-1/2"	4	0.050"	57.68
155-6973-47-0.4R	10mm	10mm	22mm	76mm	4	0.4mm	73.17
155-6973-47-0.6R	10mm	10mm	22mm	76mm	4	0.6mm	73.17
155-6973-47-0.8R	10mm	10mm	22mm	76mm	4	0.8mm	73.17
155-6973-47-1.2R	10mm	10mm	22mm	76mm	4	1.2mm	73.17
155-6973-47-2.0R	10mm	10mm	22mm	76mm	4	2.0mm	73.17
155-6973-47-2.4R	10mm	10mm	22mm	76mm	4	2.4mm	73.17
155-7363-47-0.4R	12mm	12mm	25mm	76mm	4	0.4mm	93.09
155-7363-47-0.8R	12mm	12mm	25mm	76mm	4	0.8mm	93.09
155-7363-47-1.0R	12mm	12mm	25mm	76mm	4	1.0mm	93.09
155-7363-47-1.2R	12mm	12mm	25mm	76mm	4	1.2mm	93.09
155-7363-47-2.0R	12mm	12mm	25mm	76mm	4	2.0mm	93.09
155-7453-47-0.1R	1/2"	1/2"	1"	3"	4	0.100"	88.83
155-7453-47-015R	1/2"	1/2"	1"	3"	4	0.015"	88.83
155-7453-47-.025R	1/2"	1/2"	1"	3"	4	0.025"	88.83
155-7623-47-0.4R	14mm	14mm	30mm	89mm	4	0.4mm	117.73
155-7873-47-0.4R	16mm	16mm	32mm	89mm	4	0.4mm	136.02
155-7873-47-0.8R	16mm	16mm	32mm	89mm	4	0.8mm	136.02
155-7873-47-0.9R	16mm	16mm	32mm	89mm	4	0.9mm	136.02
155-7873-47-1.2R	16mm	16mm	32mm	89mm	4	1.2mm	136.02
155-7873-47-2.0R	16mm	16mm	32mm	89mm	4	2.0mm	168.93
155-7873-47-3.0R	16mm	16mm	32mm	89mm	4	3.0mm	179.74
155-7873-47-4.0R	16mm	16mm	32mm	89mm	4	4.0mm	179.74
155-8123-47-0.8R	18mm	18mm	35mm	102mm	4	0.8mm	196.52
155-8373-47-0.5R	20mm	20mm	38mm	102mm	4	0.5mm	236.93
155-8373-47-1.2R	20mm	20mm	38mm	102mm	4	1.2mm	236.93
155-8373-47-2.4R	20mm	20mm	38mm	102mm	4	2.4mm	274.20

3152/3360 Series

Disposable 3 Flute Coated End Mills

Description

3 flute, solid carbide end mill, square end, straight shank, TiAlN coated. Available in both short and standard length.

Application

A multi purpose end mill providing a good compromise between the swarf clearance of a 2 flute and the rigidity of a 4 flute, ideally suited for slotting, TiAlN coating provides increased lubricity and life.



3360 Standard Series 3 Flute - Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
3360-3.0C	3	6	7	57	28.68
3360-4.0C	4	6	8	57	28.68
3360-5.0C	5	6	10	57	28.68
3360-6.0C	6	6	10	57	28.68
3360-8.0C	8	8	16	63	32.06
3360-10.0C	10	10	19	72	51.18
3360-12.0C	12	12	22	83	68.75



3152 Short Series 3 Flute - Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
3152-2.0C	2	6	4	35	20.97
3152-3.0C	3	6	5	35	20.97
3152-4.0C	4	6	7	38	20.97
3152-5.0C	5	6	8	39	20.97
3152-6.0C	6	6	8	39	20.97
3152-8.0C	8	8	11	43	29.29
3152-10.0C	10	10	13	50	43.78
3152-12.0C	12	12	15	55	55.80

For Speeds & Feeds please see page 99.

158-44 Series

4 Flute Ball Nose End Mill TiCN Coated



Description

4 flute, solid carbide, single end, standard length, ball nose, straight shank, 30° right hand helix, right hand cut, centre cutting, Hi-Strength geometry, TiCN coated.

Application

Similar properties to the square end tool with the added advantage of suitability for profiling and contouring operations. The combination of ultra wear resistant micrograin carbide and TiCN coating gives the potential to machine hard materials at improved surface speeds and feeds rates.

Imperial Sizes (inches)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
158-3453-44	1/8	1/8	1/2	1-1/2	31.61
158-3953-44	5/32	3/16	9/16	2	44.73
158-4553-44	3/16	3/16	5/8	2	44.37
158-5553-44	1/4	1/4	3/4	2-1/2	55.41
158-6253-44	5/16	5/16	13/16	2-1/2	65.23
158-6803-44	3/8	3/8	7/8	2-1/2	85.70
158-7453-44	1/2	1/2	1	3	113.74
158-7853-44	5/8	5/8	1-1/4	3-1/2	200.17
158-8253-44	3/4	3/4	1-1/2	4	319.85

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
158-2523-44	2	3	7	38	36.60
158-2913-44	2.5	3	7	38	36.60
158-3373-44	3	3	9	38	34.91
158-4013-44	4	4	14	50	43.24
158-4763-44	5	5	16	50	47.07
158-5373-44	6	6	19	64	55.21
158-6283-44	8	8	21	64	70.05
158-6973-44	10	10	22	73	97.26
158-7363-44	12	12	25	76	129.84
158-7873-44	16	16	32	89	200.17
158-8373-44	20	20	38	102	281.30

For Speeds & Feeds please see page 99.

158-47 Series

4 Flute Square End Mill TiCN Coated



Description

4 flute, solid carbide, single end, standard length, square end, straight shank, 30° right hand helix, centre cutting, Hi Strength geometry, TiCN coated.

Application

The 158 series Hi-Strength end mills offer improved performance over conventional solid carbide tools. The combination of ultra wear resistant micrograin carbide and TiCN coating gives the potential to machine hard materials at improved surface speeds and feeds rates.

Imperial Sizes (inches)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
158-3453-47	1/8	1/8	1/2	1-1/2	23.89
158-3953-47	5/32	3/16	9/16	2	31.51
158-4553-47	3/16	3/16	5/8	2	34.43
158-5153-47	7/32	1/4	5/8	2-1/2	39.46
158-5553-47	1/4	1/4	3/4	2-1/2	43.75
158-6003-47	9/32	9/32	3/4	2-1/2	50.80
158-6253-47	5/16	5/16	13/16	2-1/2	51.06
158-6803-47	3/8	3/8	7/8	2-1/2	85.22
158-7253-47	7/16	7/16	1	2-3/4	86.67
158-7453-47	1/2	1/2	1	3	107.25
158-7853-47	5/8	5/8	1-1/4	3-1/2	173.25
158-8253-47	3/4	3/4	1-1/2	4	225.85

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
158-2123-47	1	3	3	38	29.43
158-2523-47	2	3	7	38	29.06
158-2913-47	2.5	3	7	38	29.06
158-3373-47	3	3	9	38	24.36
158-4013-47	4	4	14	50	33.72
158-4763-47	5	5	16	50	36.60
158-5373-47	6	6	19	64	44.46
158-6283-47	8	8	21	64	56.01
158-6973-47	10	10	22	70	87.27
158-7363-47	12	12	25	76	113.59
158-7623-47	14	14	30	89	135.88
158-7873-47	16	16	32	89	180.52
158-8373-47	20	20	38	102	265.16

160-47 Series

4 Flute Double End Stub



Description

4 flute, solid carbide, double end, stub length, square end, straight shank, 30° right hand helix, centre cutting.

Application

The 4 flute geometry combined with the stub length offers maximum rigidity. Typical uses are machining of keyways and shallow slots. Double end provides excellent value for money.

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
160-1303-47	M35401	1/32	1/8	3/32	1-1/2	25.96
160-1953-47	M34201	3/64	1/8	1/8	1-1/2	25.96
160-2153-47	M34202	1/16	1/8	1/8	1-1/2	21.55
160-2803-47	M34211	3/32	1/8	3/16	1-1/2	21.55
160-3453-47	M34220	1/8	3/16	1/4	2	20.03
160-3953-47		5/32	3/16	5/16	2	28.07
160-4553-47	M34241	3/16	3/16	3/8	2	28.62
160-5153-47	M34251	7/32	1/4	7/16	2-1/2	37.15
160-5553-47	M34261	1/4	1/4	1/2	2-1/2	37.15
160-6253-47	M34280	5/16	5/16	1/2	2-1/2	51.23
160-6803-47		3/8	3/8	1/2	2-1/2	51.67
160-7253-47		7/16	7/16	9/16	2-3/4	78.12
160-7453-47	M34300	1/2	1/2	5/8	3	89.37

Metric Sizes (mm)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
160-2523-47	M31772	2	3	4	38	20.76
160-2913-47	M31780	2.5	3	5	38	20.76
160-3373-47	M31781	3	3	6	51	19.48
160-3573-47	M31782	3.5	4	7	51	27.49
160-4013-47	M31790	4	4	8	51	27.49
160-4363-47	M31791	4.5	5	9	51	31.77
160-4763-47	M31792	5	5	10	51	31.77
160-5373-47	M31800	6	6	12	64	37.15
160-5893-47	M31801	7	8	12	64	42.64
160-6283-47	M31802	8	8	12	64	50.35
160-6633-47		9	10	12	70	61.36
160-6973-47	M31811	10	10	12	70	67.83
160-7233-47	M31820	11	11	14	70	81.52
160-7363-47	M31812	12	12	16	76	99.23

For Speeds & Feeds please see page 99.

162-24 Series

2 Flute Ball Nose



Description

2 flute, solid carbide, single end, long length, ball nose, straight shank, 30° right hand helix, right hand cut, centre cutting.

Application

Suitable for use in applications where a standard 2 flute ball nose does not offer sufficient reach.

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
162-3453-24	M30621	1/8	1/8	13/4	2-1/4	46.39
162-4553-24	M30650	3/16	3/16	3/4	2-1/2	50.37
162-5553-24	M30671	1/4	1/4	1-1/8	3	55.33
162-6253-24	M30682	5/16	5/16	1-1/8	3	64.63
162-6803-24	M30701	3/8	3/8	1-1/8	3	82.85
162-7253-24		7/16	7/16	2	4	110.72
162-7453-24	M30730	1/2	1/2	2	4	127.04
162-7853-24	M30742	5/8	5/8	2-1/4	5	228.25
162-8253-24		3/4	3/4	2-1/4	5	301.76

Metric Sizes (mm)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
162-3373-24		3	3	20	55	52.47
162-4013-24		4	4	20	64	52.97
162-4763-24		5	5	25	64	60.16
162-5373-24		6	6	28	75	61.18
162-6283-24		8	8	25	75	75.34
162-6973-24		10	10	30	75	110.29
162-7363-24		12	12	50	100	137.99
162-7873-24		16	16	60	125	221.67
162-8373-24		20	20	60	125	353.93

For Speeds & Feeds please see page 99.

162-27 Series

2 Flute Square End



Description

2 flute, solid carbide, single end, long length, straight shank, 30° right hand helix, right hand cut, centre cutting.

Application

Suitable for applications where a standard 2 flute tool does not offer sufficient reach. Most commonly used on soft non-ferrous materials.

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
162-3453-27	M30940	1/8	1/8	13/4	2-1/4	42.46
162-4553-27	M30962	3/16	3/16	3/4	2-1/2	47.23
162-5553-27	M30991	1/4	1/4	1-1/8	3	48.63
162-6253-27	M31020	5/16	5/16	1-1/8	3	60.43
162-6803-27	M31041	3/8	3/8	1-1/8	3	76.43
162-7253-27		7/16	7/16	2	4	104.21
162-7453-27	M31090	1/2	1/2	2	4	118.03
162-7853-27	M31120	5/8	5/8	2-1/4	5	193.58
162-8253-27	M31132	3/4	3/4	2-1/4	5	286.49

Metric Sizes (mm)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
162-3373-27	M31461	3	3	20	64	38.76
162-4013-27	M31471	4	4	20	64	41.31
162-4763-27	M31481	5	5	25	64	47.98
162-5373-27	M31491	6	6	28	75	50.98
162-6283-27	M31501	8	8	28	75	64.24
162-6973-27		10	10	30	75	68.89
162-7363-27		12	12	50	100	124.08
162-7873-27		16	16	60	125	194.31
162-8373-27		20	20	60	125	339.05

For Speeds & Feeds please see page 99.

162-44 Series

4 Flute Ball Nose



Description

4 flute, solid carbide, single end, long length, ball nose, straight shank, 30° right hand helix, right hand cut, centre cutting.

Application

Suitable for contouring and finishing operations in applications where the standard ball nose end mill does not have sufficient reach. Offers improved rigidity over 2 and 3 flute tool.

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
162-3453-44	M33100	1/8	1/8	3/4	2-1/4	46.39
162-4553-44	M33121	3/16	3/16	3/4	2-1/2	50.37
162-5553-44	M33142	1/4	1/4	1-1/8	3	55.33
162-6253-44	M33160	5/16	5/16	1-1/8	3	64.63
162-6803-44	M33171	3/8	3/8	1-1/8	3	82.85
162-7253-44	M33281	7/16	7/16	2	4	110.72
162-7453-44	M33201	1/2	1/2	2	4	127.04
162-7853-44	M33220	5/8	5/8	2-1/4	5	228.25
162-8253-44		3/4	3/4	2-1/4	5	301.76

Metric Sizes (mm)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
162-3373-44		3	3	20	55	52.47
162-4013-44		4	4	20	64	52.97
162-4763-44		5	5	25	64	60.16
162-5373-44		6	6	30	75	61.18
162-6283-44		8	8	30	75	75.34
162-6973-44		10	10	30	75	110.29
162-7363-44		12	12	50	100	137.99
162-7873-44		16	16	60	125	221.67
162-8373-44		20	20	60	125	353.93

For Speeds & Feeds please see page 99.

162-47 Series

4 Flute Square End



Description

4 flute, solid carbide, single end, long length, straight shank, 30° right hand helix, right hand cut, centre cutting.

Application

The long series 4 flute end mill is recommended for finishing passes on deep profile milling operations. The additional length provides typically double the flute length of standard end mills.

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
162-3453-47	M33420	1/8	1/8	3/4	2-1/4	42.46
162-4553-47	M33442	3/16	3/16	3/4	2-1/2	47.23
162-5553-47	M33480	1/4	1/4	1-1/8	3	48.63
162-6253-47	M33502	5/16	5/16	1-1/8	3	60.43
162-6803-47	M33531	3/8	3/8	1-1/8	3	76.43
162-7253-47		7/16	7/16	2	4	104.21
162-7453-47	M33590	1/2	1/2	2	4	118.03
162-7853-47	M33610	5/8	5/8	2-1/4	5	193.58
162-8253-47		3/4	3/4	2-1/4	5	286.49

Metric Sizes (mm)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
162-3373-47	M34071	3	3	20	64	38.67
162-4013-47	M34081	4	4	20	64	41.31
162-4763-47	M34091	5	5	25	64	47.98
162-5373-47		6	6	30	75	50.98
162-6283-47		8	8	30	75	64.24
162-6973-47		10	10	30	75	68.89
162-7363-47		12	12	50	100	124.08
162-7873-47		16	16	60	125	194.31
162-8373-47		20	20	60	125	339.05

For Speeds & Feeds please see page 99.

163-24 Series

2 Flute Ball Nose



Description

2 flute, solid carbide, single end, extra long length, ball nose, straight shank, 30° right hand helix, right hand cut, centre cutting.

Application

Suitable for use in applications where a 162 series long length 2 flute ball nose does not offer sufficient reach.

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
163-3453-24	M30771	1/8	1/8	3/4	3	54.19
163-4553-24		3/16	3/16	1	3	62.53
163-5553-24		1/4	1/4	1-1/2	4	65.56
163-6253-24	M30782	5/16	5/16	1	4	75.11
163-6803-24	M30700	3/8	3/8	1-3/4	4	102.47
163-7253-24		7/16	7/16	3	6	154.76
163-7453-24	M30731	1/2	1/2	3	6	195.79
163-7853-24		5/8	5/8	3	6	348.21
163-8253-24		3/4	3/4	3	6	424.10

Metric Sizes (mm)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
163-3373-24		3	3	25	75	54.19
163-4013-24		4	4	28	75	61.03
163-4763-24		5	5	31	100	58.75
163-5373-24		6	6	38	100	64.21
163-6283-24		8	8	40	100	75.19
163-6973-24		10	10	45	100	102.47
163-7363-24		12	12	75	150	192.00
163-7873-24		16	16	75	150	304.10
163-8373-24		20	20	80	150	473.65

For Speeds & Feeds please see page 99.

163-27 Series

2 Flute Square End



Description

2 flute, solid carbide, single end, extra long length, square end, straight shank, 30° right hand helix, right hand cut, centre cutting.

Application

Suitable for applications where the 162 series long length does not offer sufficient reach. Most commonly used on soft non-ferrous materials.

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
163-3453-27	M30941	1/8	1/8	1	3	48.27
163-4553-27	M30970	3/16	3/16	1-1/8	3	56.63
163-5553-27	M30992	1/4	1/4	1-1/2	4	58.45
163-6253-27	M31021	5/16	5/16	1-5/8	4	71.29
163-6803-27	M31042	3/8	3/8	1-3/4	4	99.00
163-7253-27	M31202	7/16	7/16	3	6	149.02
163-7453-27	M31091	1/2	1/2	3	6	171.32
163-7853-27		5/8	5/8	3	6	281.72

Metric Sizes (mm)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
163-3373-27	M31462	3	3	25	75	48.27
163-4013-27	M31472	4	4	28	75	52.15
163-4763-27	M31482	5	5	31	100	56.41
163-5373-27	M31492	6	6	38	100	59.88
163-6283-27	M31502	8	8	40	100	69.99
163-6973-27	M31512	10	10	45	100	93.43
163-7363-27	M31522	12	12	75	150	171.32
163-7873-27		16	16	75	150	282.81
163-8373-27		20	20	80	150	422.75

For Speeds & Feeds please see page 99.

163-44 Series

4 Flute Ball Nose



Description

4 flute, solid carbide, single end, extra long length, ball nose, straight shank, 30° right hand helix, right hand cut, centre cutting.

Application

Suitable for contouring and finishing operations in applications where the 162 series long length end mill does not have sufficient reach. Offers improved rigidity over 2 and 3 flute tools.

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
163-3453-44		1/8	1/8	3/4	3	54.19
163-4553-44		3/16	3/16	1	3	62.53
163-5553-44		1/4	1/4	1-1/2	4	65.56
163-6253-44	M33262	5/16	5/16	1	4	75.11
163-6803-44	M33172	3/8	3/8	1-3/4	4	102.47
163-7253-44		7/16	7/16	3	6	154.76
163-7453-44	M33202	1/2	1/2	3	6	195.79
163-7853-44		5/8	5/8	3	6	348.21

Metric Sizes (mm)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
163-3373-44		3	3	30	70	54.19
163-4013-44		4	4	28	75	61.03
163-4763-44		5	5	31	100	64.54
163-5373-44		6	6	38	100	65.49
163-6283-44		8	8	40	100	75.19
163-6973-44		10	10	45	100	102.47
163-7363-44		12	12	75	150	192.65
163-7873-44		16	16	75	150	335.23
163-8373-44		20	20	80	150	475.24

For Speeds & Feeds please see page 99.

163-47 Series

4 Flute Square End



Description

4 flute, solid carbide, single end, extra long length, straight shank, 30° right hand helix, right hand cut, centre cutting.

Application

The extra long series 4 flute end mill is recommended for finishing passes on deep profile milling operations.

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
163-3453-47	M33421	1/8	1/8	3/4	3	48.27
163-4553-47	M33450	3/16	3/16	1	3	56.63
163-5553-47	M33481	1/4	1/4	1-1/2	4	58.45
163-6253-47	M33510	5/16	5/16	1-5/8	4	71.29
163-6803-47	M33540	3/8	3/8	1-3/4	4	99.00
163-7253-47		7/16	7/16	3	6	149.02
163-7453-47	M33582	1/2	1/2	3	6	171.32
163-7853-47	M33732	5/8	5/8	3	6	281.72

Metric Sizes (mm)

CATALOGUE No.	M NUMBER	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
163-3373-47	M34072	3	3	25	75	48.27
163-4013-47	M34082	4	4	31	75	52.15
163-4763-47	M34092	5	5	31	100	56.41
163-5373-47	M34101	6	6	38	100	59.88
163-6283-47		8	8	40	100	69.99
163-6973-47		10	10	45	100	93.43
163-7363-47	M34132	12	12	75	150	171.32
163-7873-47		16	16	75	150	282.81
163-8373-47		20	20	80	150	422.75

For Speeds & Feeds please see page 99.

1031 Series

High Performance Solid Carbide Drill



Description

Solid carbide high performance drill. 3 x D effective drill length with ALTiN coating for increased productivity and tool life.

Application

Designed to produce extremely accurate holes in a wide range of materials including Steels, Stainless Steel, Cast Iron, Titanium, Nickel Based Materials and Non Ferrous Alloys.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
1031-3.0	3.0	6.0	20	62	61.24
1031-3.1	3.1	6.0	20	62	61.24
1031-3.2	3.2	6.0	20	62	61.24
1031-3.3	3.3	6.0	20	62	61.24
1031-3.4	3.4	6.0	20	62	61.24
1031-3.5	3.5	6.0	20	62	61.24
1031-3.6	3.6	6.0	20	62	61.24
1031-3.7	3.7	6.0	20	62	61.24
1031-3.8	3.8	6.0	24	66	61.24
1031-3.9	3.9	6.0	24	66	61.24
1031-4.0	4.0	6.0	24	66	61.24
1031-4.1	4.1	6.0	24	66	61.24
1031-4.2	4.2	6.0	24	66	61.24
1031-4.3	4.3	6.0	24	66	61.24
1031-4.4	4.4	6.0	24	66	61.24
1031-4.5	4.5	6.0	24	66	61.24
1031-4.6	4.6	6.0	24	66	61.24
1031-4.7	4.7	6.0	24	66	61.24
1031-4.8	4.8	6.0	24	66	61.24
1031-4.9	4.9	6.0	28	66	61.24
1031-5.0	5.0	6.0	28	66	61.24
1031-5.1	5.1	6.0	28	66	61.24
1031-5.2	5.2	6.0	28	66	61.24
1031-5.3	5.3	6.0	28	66	61.24
1031-5.4	5.4	6.0	28	66	61.24
1031-5.5	5.5	6.0	28	66	61.24
1031-5.6	5.6	6.0	28	66	61.24

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
1031-5.7	5.7	6.0	28	66	61.24
1031-5.8	5.8	6.0	28	66	61.24
1031-6.0	6.0	6.0	28	66	61.24
1031-6.1	6.1	8.0	34	79	61.24
1031-6.2	6.2	8.0	34	79	61.24
1031-6.3	6.3	8.0	34	79	61.24
1031-6.4	6.4	8.0	34	79	61.24
1031-6.5	6.5	8.0	34	79	61.24
1031-6.6	6.6	8.0	34	79	61.24
1031-6.7	6.7	8.0	34	79	61.24
1031-6.8	6.8	8.0	34	79	61.24
1031-6.9	6.9	8.0	34	79	61.24
1031-7.0	7.0	8.0	34	79	61.24
1031-7.1	7.1	8.0	41	79	61.24
1031-7.2	7.2	8.0	41	79	61.24
1031-7.3	7.3	8.0	41	79	61.24
1031-7.4	7.4	8.0	41	79	61.24
1031-7.5	7.5	8.0	41	79	61.24
1031-7.6	7.6	8.0	41	79	61.24
1031-7.7	7.7	8.0	41	79	61.24
1031-7.8	7.8	8.0	41	79	61.24
1031-7.9	7.9	8.0	41	79	61.24
1031-8.0	8.0	8.0	41	79	61.24
1031-8.1	8.1	10.0	47	79	68.58
1031-8.2	8.2	10.0	47	79	68.58
1031-8.4	8.4	10.0	47	79	68.58
1031-8.3	8.3	10.0	47	79	68.58

1031 Series

High Performance Solid Carbide Drill

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £	CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
1031-8.4	8.4	10.0	47	89	70.64	1031-11.2	11.2	12.0	55	102	105.46
1031-8.5	8.5	10.0	47	89	70.64	1031-11.3	11.3	12.0	55	102	105.46
1031-8.6	8.6	10.0	47	89	70.64	1031-11.4	11.4	12.0	55	102	105.46
1031-8.7	8.7	10.0	47	89	70.64	1031-11.5	11.5	12.0	55	102	105.46
1031-8.8	8.8	10.0	47	89	70.64	1031-11.6	11.6	12.0	55	102	105.46
1031-8.9	8.9	10.0	47	89	70.64	1031-11.7	11.7	12.0	55	102	105.46
1031-9.0	9.0	10.0	47	89	70.64	1031-11.8	11.8	12.0	55	102	105.46
1031-9.1	9.1	10.0	47	89	70.64	1031-11.9	11.9	12.0	55	102	105.46
1031-9.2	9.2	10.0	47	89	70.64	1031-12.0	12.0	12.0	55	102	105.46
1031-9.3	9.3	10.0	47	89	70.64	1031-12.5	12.5	14.0	60	107	141.61
1031-9.4	9.4	10.0	47	89	70.64	1031-13.0	13.0	14.0	60	107	141.61
1031-9.5	9.5	10.0	47	89	70.64	1031-13.5	13.5	14.0	60	107	141.61
1031-9.6	9.6	10.0	47	89	70.64	1031-14.0	14.0	14.0	60	107	141.61
1031-9.7	9.7	10.0	47	89	70.64	1031-14.5	14.5	16.0	65	115	182.32
1031-9.8	9.8	10.0	47	89	70.64	1031-15.0	15.0	16.0	65	115	182.32
1031-9.9	9.9	10.0	47	89	70.64	1031-15.5	15.5	16.0	65	115	182.32
1031-10.0	10.0	10.0	47	89	70.64	1031-16.0	16.0	16.0	65	115	182.32
1031-10.1	10.1	12.0	55	102	105.46	1031-16.5	16.5	18.0	73	123	222.92
1031-10.2	10.2	12.0	55	102	105.46	1031-17.0	17.0	18.0	73	123	222.92
1031-10.3	10.3	12.0	55	102	105.46	1031-17.5	17.5	18.0	73	123	222.92
1031-10.4	10.4	12.0	55	102	105.46	1031-18.0	18.0	18.0	73	123	222.92
1031-10.5	10.5	12.0	55	102	105.46	1031-18.5	18.5	20.0	79	131	308.13
1031-10.6	10.6	12.0	55	102	105.46	1031-19.0	19.0	20.0	79	131	308.13
1031-10.7	10.7	12.0	55	102	105.46	1031-19.5	19.5	20.0	79	131	308.13
1031-10.8	10.8	12.0	55	102	105.46	1031-20.0	20.0	20.0	79	131	308.13
1031-10.9	10.9	12.0	55	102	105.46						
1031-11.0	11.0	12.0	55	102	105.46						
1031-11.1	11.1	12.0	55	102	105.46						

For Speeds & Feeds please see pages 146.

1032 Series

High Performance Solid Carbide Drill - Internal Coolant



Description

Solid carbide high performance drill. 3 x D effective drill length with ALTiN coating & coolant holes for increased productivity and tool life.

Application

Designed to produce extremely accurate holes in a wide range of materials including Steels, Stainless Steel, Cast Iron, Titanium, Nickel Based Materials and on Ferrous Alloys.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £	CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
1032-3.0	3.0	6.0	20	62	70.30	1032-5.7	5.7	6.0	28	66	79.43
1032-3.1	3.1	6.0	20	62	70.30	1032-5.8	5.8	6.0	28	66	79.43
1032-3.2	3.2	6.0	20	62	70.30	1032-5.9	5.9	6.0	28	66	79.43
1032-3.3	3.3	6.0	20	62	70.30	1032-6.0	6.0	6.0	28	66	79.43
1032-3.4	3.4	6.0	20	62	70.30	1032-6.1	6.1	8.0	34	79	103.12
1032-3.5	3.5	6.0	20	62	70.30	1032-6.2	6.2	8.0	34	79	103.12
1032-3.6	3.6	6.0	20	62	70.30	1032-6.3	6.3	8.0	34	79	103.12
1032-3.7	3.7	6.0	20	62	70.30	1032-6.4	6.4	8.0	34	79	103.12
1032-3.8	3.8	6.0	24	66	70.30	1032-6.5	6.5	8.0	34	79	103.12
1032-3.9	3.9	6.0	24	66	70.30	1032-6.6	6.6	8.0	34	79	103.12
1032-4.0	4.0	6.0	24	66	79.43	1032-6.7	6.7	8.0	34	79	103.12
1032-4.1	4.1	6.0	24	66	79.43	1032-6.8	6.8	8.0	34	79	103.12
1032-4.2	4.2	6.0	24	66	79.43	1032-6.9	6.9	8.0	34	79	103.12
1032-4.3	4.3	6.0	24	66	79.43	1032-7.0	7.0	8.0	34	79	103.12
1032-4.4	4.4	6.0	24	66	79.43	1032-7.1	7.1	8.0	41	79	103.12
1032-4.5	4.5	6.0	24	66	79.43	1032-7.2	7.2	8.0	41	79	103.12
1032-4.6	4.6	6.0	24	66	79.43	1032-7.3	7.3	8.0	41	79	103.12
1032-4.7	4.7	6.0	24	66	79.43	1032-7.4	7.4	8.0	41	79	103.12
1032-4.8	4.8	6.0	24	66	79.43	1032-7.5	7.5	8.0	41	79	103.12
1032-4.9	4.9	6.0	28	66	79.43	1032-7.6	7.6	8.0	41	79	103.12
1032-5.0	5.0	6.0	28	66	79.43	1032-7.7	7.7	8.0	41	79	103.12
1032-5.1	5.1	6.0	28	66	79.43	1032-7.8	7.8	8.0	41	79	103.12
1032-5.2	5.2	6.0	28	66	79.43	1032-7.9	7.9	8.0	41	79	103.12
1032-5.3	5.3	6.0	28	66	79.43	1032-8.0	8.0	8.0	41	79	103.12
1032-5.4	5.4	6.0	28	66	79.43	1032-8.1	8.1	10.0	47	79	115.58
1032-5.5	5.5	6.0	28	66	79.43	1032-8.2	8.2	10.0	47	79	115.58
1032-5.6	5.6	6.0	28	66	79.43	1032-8.3	8.3	10.0	47	79	115.58

1032 Series

High Performance Solid Carbide Drill - Internal Coolant

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
1032-8.4	8.4	10.0	47	89	115.58
1032-8.5	8.5	10.0	47	89	115.58
1032-8.6	8.6	10.0	47	89	115.58
1032-8.7	8.7	10.0	47	89	115.58
1032-8.8	8.8	10.0	47	89	115.58
1032-8.9	8.9	10.0	47	89	115.58
1032-9.0	9.0	10.0	47	89	115.58
1032-9.1	9.1	10.0	47	89	115.58
1032-9.2	9.2	10.0	47	89	115.58
1032-9.3	9.3	10.0	47	89	115.58
1032-9.4	9.4	10.0	47	89	115.58
1032-9.5	9.5	10.0	47	89	115.58
1032-9.6	9.6	10.0	47	89	115.58
1032-9.7	9.7	10.0	47	89	115.58
1032-9.8	9.8	10.0	47	89	115.58
1032-9.9	9.9	10.0	47	89	115.58
1032-10.0	10.0	10.0	47	89	115.58
1032-10.1	10.1	12.0	55	102	165.41
1032-10.2	10.2	12.0	55	102	165.41
1032-10.3	10.3	12.0	55	102	165.41
1032-10.4	10.4	12.0	55	102	165.41
1032-10.5	10.5	12.0	55	102	165.41
1032-10.6	10.6	12.0	55	102	165.41
1032-10.7	10.7	12.0	55	102	165.41
1032-10.8	10.8	12.0	55	102	165.41
1032-10.9	10.9	12.0	55	102	165.41
1032-11.0	11.0	12.0	55	102	165.41
1032-11.1	11.1	12.0	55	102	165.41
1032-11.2	11.2	12.0	55	102	165.41
1032-11.3	11.3	12.0	55	102	165.41
1032-11.4	11.4	12.0	55	102	165.41
1032-11.5	11.5	12.0	55	102	165.41
1032-11.6	11.6	12.0	55	102	165.41
1032-11.7	11.7	12.0	55	102	165.41
1032-11.8	11.8	12.0	55	102	165.41
1032-11.9	11.9	12.0	55	102	165.41
1032-12.0	12.0	12.0	55	102	165.41
1032-12.5	12.5	14.0	60	107	231.05
1032-13.0	13.0	14.0	60	107	231.05
1032-13.5	13.5	14.0	60	107	231.05
1032-14.0	14.0	14.0	60	107	231.05
1032-14.5	14.5	16.0	65	115	282.10
1032-15.0	15.0	16.0	65	115	282.10
1032-15.5	15.5	16.0	65	115	282.10
1032-16.0	16.0	16.0	65	115	282.10
1032-16.5	16.5	18.0	73	123	452.97
1032-17.0	17.0	18.0	73	123	452.97
1032-17.5	17.5	18.0	73	123	452.97
1032-18.0	18.0	18.0	73	123	452.97
1032-18.5	18.5	20.0	79	131	495.24
1032-19.0	19.0	20.0	79	131	495.24
1032-19.5	19.5	20.0	79	131	495.24
1032-20.0	20.0	20.0	79	131	495.24

1052 Series

High Performance Solid Carbide Drill - Internal Coolant



Description

Solid carbide high performance drill. 5 x D effective drill length with ALTiN coating & coolant holes for increased productivity and tool life.

Application

Designed to produce extremely accurate holes in a wide range of materials including Steels, Stainless Steel, Cast Iron, Titanium, Nickel Based Materials and Non Ferrous Alloys.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	PRICE £
1052-3.0	3.0	6.0	28	66	90.66
1052-3.1	3.1	6.0	28	66	90.66
1052-3.2	3.2	6.0	28	66	90.66
1052-3.3	3.3	6.0	28	66	90.66
1052-3.4	3.4	6.0	28	66	90.66
1052-3.5	3.5	6.0	28	66	90.66
1052-3.6	3.6	6.0	28	66	90.66
1052-3.7	3.7	6.0	28	66	90.66
1052-3.8	3.8	6.0	36	74	90.66
1052-3.9	3.9	6.0	36	74	90.66
1052-4.0	4.0	6.0	36	74	97.34
1052-4.1	4.1	6.0	36	74	97.34
1052-4.2	4.2	6.0	36	74	97.34
1052-4.3	4.3	6.0	36	74	97.34
1052-4.4	4.4	6.0	36	74	97.34
1052-4.5	4.5	6.0	36	74	97.34
1052-4.6	4.6	6.0	36	74	97.34
1052-4.7	4.7	6.0	36	74	97.34
1052-4.8	4.8	6.0	44	82	97.34
1052-4.9	4.9	6.0	44	82	97.34
1052-5.0	5.0	6.0	44	82	97.34
1052-5.1	5.1	6.0	44	82	97.34
1052-5.2	5.2	6.0	44	82	97.34
1052-5.3	5.3	6.0	44	82	97.34
1052-5.4	5.4	6.0	44	82	97.34
1052-5.5	5.5	6.0	44	82	97.34
1052-5.6	5.6	6.0	44	82	97.34

CATALOGUE No.	SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	PRICE £
1052-5.7	5.7	6.0	44	82	97.34
1052-5.8	5.8	6.0	44	82	97.34
1052-6.0	6.0	6.0	44	82	97.34
1052-6.1	6.1	8.0	53	91	107.68
1052-6.2	6.2	8.0	53	91	107.68
1052-6.3	6.3	8.0	53	91	107.68
1052-6.4	6.4	8.0	53	91	107.68
1052-6.5	6.5	8.0	53	91	107.68
1052-6.6	6.6	8.0	53	91	107.68
1052-6.7	6.7	8.0	53	91	107.68
1052-6.8	6.8	8.0	53	91	107.68
1052-6.9	6.9	8.0	53	91	107.68
1052-7.0	7.0	8.0	53	91	107.68
1052-7.1	7.1	8.0	53	91	107.68
1052-7.2	7.2	8.0	53	91	107.68
1052-7.3	7.3	8.0	53	91	107.68
1052-7.4	7.4	8.0	53	91	107.68
1052-7.5	7.5	8.0	53	91	107.68
1052-7.6	7.6	8.0	53	91	107.68
1052-7.7	7.7	8.0	53	91	107.68
1052-7.8	7.8	8.0	53	91	107.68
1052-7.9	7.9	8.0	53	91	107.68
1052-8.0	8.0	8.0	53	91	107.68
1052-8.1	8.1	10.0	61	103	123.48
1052-8.2	8.2	10.0	61	103	123.48
1052-8.4	8.4	10.0	61	103	123.48
1052-8.3	8.3	10.0	61	103	123.48

1052 Series

High Performance Solid Carbide Drill - Internal Coolant

CATALOGUE No.	SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	PRICE £
1052-8.4	8.4	10.0	61	103	123.48
1052-8.5	8.5	10.0	61	103	123.48
1052-8.6	8.6	10.0	61	103	123.48
1052-8.7	8.7	10.0	61	103	123.48
1052-8.8	8.8	10.0	61	103	123.48
1052-8.9	8.9	10.0	61	103	123.48
1052-9.0	9.0	10.0	61	103	123.48
1052-9.1	9.1	10.0	61	103	123.48
1052-9.2	9.2	10.0	61	103	123.48
1052-9.3	9.3	10.0	61	103	123.48
1052-9.4	9.4	10.0	61	103	123.48
1052-9.5	9.5	10.0	61	103	123.48
1052-9.6	9.6	10.0	61	103	123.48
1052-9.7	9.7	10.0	61	103	123.48
1052-9.8	9.8	10.0	61	103	123.48
1052-9.9	9.9	10.0	61	103	123.48
1052-10.0	10.0	10.0	61	103	123.48
1052-10.1	10.1	12.0	71	118	180.32
1052-10.2	10.2	12.0	71	118	180.32
1052-10.3	10.3	12.0	71	118	180.32
1052-10.4	10.4	12.0	71	118	180.32
1052-10.5	10.5	12.0	71	118	180.32
1052-10.6	10.6	12.0	71	118	180.32
1052-10.7	10.7	12.0	71	118	180.32
1052-10.8	10.8	12.0	71	118	180.32
1052-10.9	10.9	12.0	71	118	180.32
1052-11.0	11.0	12.0	71	118	180.32
1052-11.1	11.1	12.0	71	118	180.32

CATALOGUE No.	SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	PRICE £
1052-11.2	11.2	12.0	71	118	180.32
1052-11.3	11.3	12.0	71	118	180.32
1052-11.4	11.4	12.0	71	118	180.32
1052-11.5	11.5	12.0	71	118	180.32
1052-11.6	11.6	12.0	71	118	180.32
1052-11.7	11.7	12.0	71	118	180.32
1052-11.8	11.8	12.0	71	118	180.32
1052-11.9	11.9	12.0	71	118	180.32
1052-12.0	12.0	12.0	71	118	180.32
1052-12.5	12.5	14.0	77	124	242.61
1052-13.0	13.0	14.0	77	124	242.61
1052-13.5	13.5	14.0	77	124	242.61
1052-14.0	14.0	14.0	77	124	242.61
1052-14.5	14.5	16.0	83	133	299.12
1052-15.0	15.0	16.0	83	133	299.12
1052-15.5	15.5	16.0	83	133	299.12
1052-16.0	16.0	16.0	83	133	299.12
1052-16.5	16.5	18.0	93	143	479.44
1052-17.0	17.0	18.0	93	143	479.44
1052-17.5	17.5	18.0	93	143	479.44
1052-18.0	18.0	18.0	93	143	479.44
1052-18.5	18.5	20.0	101	153	521.38
1052-19.0	19.0	20.0	101	153	521.38
1052-19.5	19.5	20.0	101	153	521.38
1052-20.0	20.0	20.0	101	153	521.38

For Speeds & Feeds please see pages 146.

1082 Series

High Performance Solid Carbide Drill - 4 Lands - Internal Coolant



Description

Solid carbide high performance drill. 8 x D effective drill length with ALTiN coating & coolant holes for increased productivity and tool life. Also, with 4 Lands for improved surface finish.

Application

Designed to produce extremely accurate holes in a wide range of materials including Steels, Stainless Steel, Cast Iron, Titanium, Nickel Based Materials and Non Ferrous Alloys.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
1082-3.0	3.0	6.0	32	70	161.97
1082-3.3	3.3	6.0	32	70	161.97
1082-3.5	3.5	6.0	32	70	161.97
1082-3.7	3.7	6.0	32	70	161.97
1082-3.8	3.8	6.0	42	80	161.97
1082-4.0	4.0	6.0	42	80	161.97
1082-4.2	4.2	6.0	42	80	161.97
1082-4.5	4.5	6.0	42	80	161.97
1082-4.7	4.7	6.0	42	80	161.97
1082-4.8	4.8	6.0	54	92	161.97
1082-5.0	5.0	6.0	54	92	161.97
1082-5.5	5.5	6.0	54	92	161.97
1082-5.8	5.8	6.0	54	92	161.97
1082-6.0	6.0	6.0	54	92	151.40
1082-6.5	6.5	8.0	62	100	178.21
1082-6.8	6.8	8.0	62	100	178.21
1082-7.0	7.0	8.0	70	108	178.21
1082-7.5	7.5	8.0	70	108	178.21
1082-7.8	7.8	8.0	70	108	178.21
1082-8.0	8.0	8.0	70	108	171.09
1082-8.5	8.5	10.0	80	122	261.53
1082-9.0	9.0	10.0	80	122	261.53

CATALOGUE No.	SIZE	SHANK DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
1082-9.5	9.5	10.0	88	130	261.53
1082-9.8	9.8	10.0	88	130	281.55
1082-10.0	10.0	10.0	88	130	251.29
1082-10.2	10.2	12.0	105	152	347.63
1082-10.5	10.5	12.0	105	152	347.63
1082-10.8	10.8	12.0	105	152	347.63
1082-11.0	11.0	12.0	105	152	347.63
1082-11.5	11.5	12.0	105	152	347.63
1082-11.8	11.8	12.0	105	152	347.63
1082-12.0	12.0	12.0	105	152	326.38
1082-12.5	12.5	14.0	123	170	459.09
1082-12.8	12.8	14.0	123	170	459.09
1082-13.0	13.0	14.0	123	170	459.09
1082-13.5	13.5	14.0	123	170	459.09
1082-13.8	13.8	14.0	123	170	459.09
1082-14.0	14.0	14.0	123	170	443.85
1082-14.5	14.5	16.0	142	192	622.17
1082-14.8	14.8	16.0	142	192	622.17
1082-15.0	15.0	16.0	142	192	622.17
1082-15.5	15.5	16.0	142	192	622.17
1082-15.8	15.8	16.0	142	192	622.17
1082-16.0	16.0	16.0	142	192	602.92

For Speeds & Feeds please see pages 146.

225 Series

Jobber Length



Description

Solid carbide, straight shank, 118° drill point, 20° helix, diameter tolerance +0.000mm - 0.013mm.

Application

This is an ideal general purpose carbide drill for use on non-ferrous alloys, cast iron, plastics and highly abrasive materials. Coating - TiN, AlTiN, TiCN available on request.

Metric & Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	SIZE	FLUTE LENGTH (")	OVERALL LENGTH (")	PRICE £	CATALOGUE No.	M NUMBER	SIZE	FLUTE LENGTH (")	OVERALL LENGTH (")	PRICE £
225-0010-00		90	1/8	1	23.56	225-0160-00	M43164	62	5/8	1-1/2	14.18
225-0015-00		89	1/8	1	23.56	225-0165-00	M43165	61	5/8	1-1/2	13.97
225-0020-00		88	1/8	1	23.56	225-0167-00	M43166	1,00mm	5/8	1-1/2	13.82
225-0025-00		87	1/8	1	18.11	225-0170-00		60	5/8	1-1/2	13.64
225-0030-00		86	1/8	1	18.11	225-0175-00	M43168	59	3/4	1-1/2	13.75
225-0035-00		85	1/8	1	18.11	225-0180-00	M43169	58	3/4	1-1/2	13.64
225-0040-00		84	3/16	1	18.11	225-0185-00	M43170	57	3/4	1-1/2	13.75
225-0045-00		83	3/16	1	18.11	225-0190-00		56	3/4	1-1/2	13.64
225-0050-00		82	3/16	1	18.11	225-0195-00	M43172	3/64"	3/4	1-1/2	13.68
225-0055-00		81	3/16	1	18.11	225-0200-00	M43173	55	3/4	1-1/2	13.64
225-0060-00		80	1/4	1-1/4	18.11	225-0205-00	M43174	54	3/4	1-1/2	13.82
225-0065-00	M43145	79	1/4	1-1/4	18.11	225-0208-00	M43175	1,50mm	3/4	1-1/2	13.82
225-0070-00		1/64"	1/4	1-1/4	18.11	225-0210-00	M43176	53	3/4	1-1/2	13.82
225-0075-00		78	1/4	1-1/4	17.69	225-0215-00	M43177	1/16"	3/4	1-1/2	13.82
225-0080-00		77	1/4	1-1/4	17.69	225-0220-00	M43178	52	3/4	1-1/2	13.82
225-0085-00	M43149	76	1/4	1-1/4	17.69	225-0225-00	M43179	51	3/4	1-1/2	13.82
225-0090-00		75	1/4	1-1/4	16.99	225-0230-00	M43180	50	7/8	1-3/4	13.82
225-0095-00		74	1/4	1-1/4	16.76	225-0235-00	M43181	49	7/8	1-3/4	14.58
225-0100-00		73	1/4	1-1/4	16.54	225-0240-00	M43182	48	7/8	1-3/4	14.49
225-0105-00	M43153	72	5/16	1-1/4	16.32	225-0245-00	M43184	5/64"	7/8	1-3/4	14.56
225-0110-00		71	5/16	1-1/4	16.13	225-0250-00		47	7/8	1-3/4	14.56
225-0115-00	M43155	70	5/16	1-1/4	16.69	225-0252-00	M43183	2,00mm	7/8	1-3/4	14.56
225-0120-00	M43156	69	5/16	1-1/4	16.69	225-0255-00	M43186	46	7/8	1-3/4	14.56
225-0125-00		68	5/16	1-1/4	15.86	225-0260-00	M43187	45	7/8	1-3/4	14.85
225-0130-00	M43158	1/32"	5/16	1-1/4	11.65	225-0265-00	M43188	44	1	2	15.37
225-0135-00	M43159	67	5/16	1-1/4	15.12	225-0270-00	M43189	43	1	2	15.37
225-0140-00	M43160	66	5/16	1-1/4	15.12	225-0275-00	M43190	42	1	2	15.71
225-0145-00	M43161	65	5/8	1-1/2	15.12	225-0280-00	M43191	3/32"	1	2	16.24
225-0150-00	M43162	64	5/8	1-1/2	14.61	225-0285-00	M43192	41	1	2	15.81
225-0155-00	M43163	63	5/8	1-1/2	14.39	225-0290-00	M43193	40	1	2	16.24

For Speeds & Feeds please see pages 145.

225 Series

Continued

CATALOGUE No.	M NUMBER	SIZE	FLUTE LENGTH (")	OVERALL LENGTH (")	PRICE £
225-0291-00	M43194	2,50mm	1	2	16.24
225-0295-00	M43195	39	1-1/4	2-1/4	16.50
225-0300-00	M43196	38	1-1/4	2-1/4	17.02
225-0305-00	M43197	37	1-1/4	2-1/4	17.02
225-0310-00		36	1-1/4	2-1/4	17.02
225-0315-00	M43199	7/64"	1-1/4	2-1/4	17.62
225-0320-00	M43200	35	1-1/4	2-1/4	17.62
225-0325-00	M43201	34	1-1/4	2-1/4	17.72
225-0330-00	M43202	33	1-1/4	2-1/4	17.72
225-0335-00	M43203	32	1-1/4	2-1/4	18.15
225-0337-00	M43204	3,00mm	1-1/4	2-1/4	18.34
225-0340-00	M43205	31	1-1/4	2-1/4	18.34
225-0345-00	M43206	1/8"	1-1/4	2-1/4	18.40
225-0350-00	M43207	30	1-1/4	2-1/4	19.28
225-0355-00	M43208	29	1-3/8	2-1/2	20.85
225-0357-00	M43209	3,50mm	1-3/8	2-1/2	20.91
225-0360-00	M43210	28	1-3/8	2-1/2	20.91
225-0365-00	M43211	9/64"	1-3/8	2-1/2	21.55
225-0370-00	M43212	27	1-3/8	2-1/2	21.55
225-0375-00	M43213	26	1-3/8	2-1/2	22.07
225-0380-00	M43214	25	1-3/8	2-1/2	22.15
225-0385-00	M43215	24	1-3/8	2-1/2	22.15
225-0390-00	M43216	23	1-3/8	2-1/2	22.75
225-0395-00	M43217	5/32"	1-3/8	2-1/2	22.75
225-0400-00		22	1-3/8	2-1/2	22.75
225-0401-00	M43219	4,00mm	1-3/8	2-1/2	23.62
225-0405-00	M43220	21	1-3/8	2-1/2	24.14
225-0410-00	M43221	20	1-3/8	2-1/2	24.14
225-0415-00	M43222	19	1-5/8	2-3/4	25.10
225-0420-00	M43223	18	1-5/8	2-3/4	25.35
225-0425-00	M43224	11/64"	1-5/8	2-3/4	26.50
225-0430-00	M43225	17	1-5/8	2-3/4	26.50
225-0435-00	M43226	16	1-5/8	2-3/4	27.29
225-0436-00	M43227	4,50mm	1-5/8	2-3/4	27.29
225-0440-00	M43228	15	1-5/8	2-3/4	27.29
225-0445-00	M43229	14	1-5/8	2-3/4	27.29
225-0450-00	M43230	13	1-5/8	2-3/4	27.29
225-0455-00	M43231	3/16"	1-5/8	2-3/4	27.29
225-0460-00	M43232	12	1-5/8	2-3/4	27.29
225-0465-00	M43233	11	1-5/8	2-3/4	28.05
225-0470-00	M43234	10	1-5/8	2-3/4	28.59
225-0475-00	M43235	9	1-3/4	3	30.58
225-0476-00	M43236	5,00mm	1-3/4	3	30.58
225-0480-00	M43237	8	1-3/4	3	30.58
225-0485-00	M43238	7	1-3/4	3	30.58
225-0490-00	M43239	13/64"	1-3/4	3	33.53
225-0495-00	M43240	6	1-3/4	3	33.53
225-0500-00	M43241	5	1-3/4	3	33.53
225-0505-00	M43242	4	1-3/4	3	33.53
225-0510-00	M43243	3	1-3/4	3	33.53
225-0513-00	M43244	5,50mm	1-3/4	3	34.55
225-0515-00	M43245	7/32"	1-3/4	3	34.82
225-0520-00	M43246	2	1-3/4	3	34.91
225-0525-00	M43247	1	1-3/4	3	38.90
225-0530-00		A	2	3	38.90

CATALOGUE No.	M NUMBER	SIZE	FLUTE LENGTH (")	OVERALL LENGTH (")	PRICE £
225-0535-00	M43249	15/64"	2	3-1/4	40.46
225-0537-00	M43250	6,00mm	2	3-1/4	40.52
225-0540-00	M43251	B	2	3-1/4	43.90
225-0545-00	M43252	C	2	3-1/4	43.59
225-0550-00	M43253	D	2	3-1/4	44.38
225-0555-00	M43254	E & 1/4	2	3-1/4	44.38
225-0564-00	M43255	6,50mm	2	3-1/4	47.76
225-0565-00	M43256	F	2	3-1/4	48.18
225-0570-00	M43257	G	2-1/8	3-1/2	48.18
225-0575-00	M43258	17/64"	2-1/8	3-1/2	48.18
225-0580-00	M43259	H	2-1/8	3-1/2	49.55
225-0585-00	M43260	I	2-1/8	3-1/2	50.98
225-0589-00	M43261	7,00mm	2-1/8	3-1/2	52.92
225-0590-00	M43262	J	2-1/8	3-1/2	52.92
225-0595-00	M43263	K	2-1/8	3-1/2	52.92
225-0600-00	M43264	9/32"	2-1/8	3-1/2	52.92
225-0605-00	M43265	L	2-1/8	3-1/2	54.45
225-0610-00		M	2-3/8	3-3/4	56.82
225-0611-00	M43267	7,50mm	2-3/8	3-3/4	56.85
225-0615-00	M43268	19/64"	2-3/8	3-3/4	56.85
225-0620-00	M43269	N	2-3/8	3-3/4	60.05
225-0625-00	M43270	5/16"	2-3/8	3-3/4	60.05
225-0628-00	M43271	8,00mm	2-3/8	3-3/4	63.77
225-0630-00	M43272	O	2-3/8	3-3/4	63.77
225-0635-00	M43273	P	2-3/8	3-3/4	65.60
225-0640-00	M43274	21/64"	2-1/2	4	65.60
225-0645-00		Q	2-1/2	4	70.88
225-0647-00	M43276	8,50mm	2-1/2	4	70.60
225-0650-00	M43277	R	2-1/2	4	72.95
225-0655-00	M43278	11/32"	2-1/2	4	72.95
225-0660-00	M43279	S	2-1/2	4	76.47
225-0663-00	M43280	9,00mm	2-1/2	4	76.79
225-0665-00		T	2-1/2	4	76.79
225-0670-00	M43282	23/64"	2-1/2	4	76.47
225-0675-00	M43283	U	2-3/4	4-1/4	83.44
225-0679-00	M43284	9,50mm	2-3/4	4-1/4	85.61
225-0680-00	M43285	3/8"	2-3/4	4-1/4	85.61
225-0685-00	M43286	V	2-3/4	4-1/4	94.84
225-0690-00	M43287	W	2-7/8	4-1/2	94.84
225-0695-00		25/64"	2-7/8	4-1/2	94.84
225-0697-00	M43289	10,0mm	2-7/8	4-1/2	104.29
225-0700-00		X	2-7/8	4-1/2	104.29
225-0705-00	M43291	Y	2-7/8	4-1/2	107.07
225-0710-00	M43292	13/32"	2-7/8	4-1/2	107.07
225-0715-00		Z	3	4-3/4	107.07
225-0716-00	M43294	10,5mm	2-7/8	4-1/2	113.59
225-0720-00	M43295	27/64"	2-7/8	4-1/2	113.59
225-0723-00	M43296	11,0mm	2-7/8	4-1/2	119.15
225-0725-00	M43297	7/16"	2-7/8	4-1/2	119.15
225-0729-00	M43298	11,5mm	3	4-3/4	132.69
225-0730-00		29/64"	3	4-3/4	132.69
225-0735-00	M43300	15/32"	3	4-3/4	133.55
225-0736-00	M43301	12,0mm	3	4-3/4	146.95
225-0740-00	M43302	31/64"	3	4-3/4	146.95
225-0745-00	M43303	1/2"	3	4-3/4	147.96

M112 Series

Jobber Length



Description

Similar to 225 series but available in 0.1mm increments.

Application

TiN, AlTiN (FTR), TiCN on request. **Drilled Materials:** Cast Steel, Cast Iron, Low to High Tensile Strength Steels, Non Ferrous Materials, Aluminium, Abrasive Plastic, Bronze, Copper.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	PRICE £
M112 01000	1.0	1.0	12	34	8.60
M112 01100	1.1	1.1	14	36	10.15
M112 01200	1.2	1.2	16	38	10.15
M112 01300	1.3	1.3	16	38	10.15
M112 01400	1.4	1.4	18	40	10.15
M112 01500	1.5	1.5	18	40	10.15
M112 01600	1.6	1.6	20	43	11.74
M112 01700	1.7	1.7	20	43	11.74
M112 01800	1.8	1.8	22	46	11.74
M112 01900	1.9	1.9	22	46	11.74
M112 02000	2.0	2.0	24	49	11.74
M112 02100	2.1	2.1	24	49	13.39
M112 02200	2.2	2.2	27	53	13.40
M112 02300	2.3	2.3	27	53	13.41
M112 02400	2.4	2.4	30	57	13.42
M112 02500	2.5	2.5	30	57	13.43
M112 02600	2.6	2.6	30	57	14.94
M112 02700	2.7	2.7	33	61	14.94
M112 02800	2.8	2.8	33	61	14.94
M112 02900	2.9	2.9	33	61	14.94
M112 03000	3.0	3.0	33	61	14.21
M112 03100	3.1	3.1	36	65	19.57
M112 03200	3.2	3.2	36	65	19.57
M112 03300	3.3	3.3	36	65	19.57
M112 03400	3.4	3.4	39	70	20.50
M112 03500	3.5	3.5	39	70	18.03
M112 03600	3.6	3.6	39	70	21.22
M112 03700	3.7	3.7	39	70	21.22
M112 03800	3.8	3.8	43	75	21.22
M112 03900	3.9	3.9	43	75	21.22
M112 04000	4.0	4.0	43	75	20.50
M112 04100	4.1	4.1	43	75	27.60
M112 04200	4.2	4.2	43	75	27.60
M112 04300	4.3	4.3	47	80	28.33
M112 04400	4.4	4.4	47	80	28.33
M112 04500	4.5	4.5	47	80	26.52
M112 04600	4.6	4.6	47	80	31.57

M112 Series

Continued

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	PRICE £
M112 04700	4.7	4.7	47	80	31.57
M112 04800	4.8	4.8	52	86	32.14
M112 04900	4.9	4.9	52	86	32.14
M112 05000	5.0	5.0	52	86	30.80
M112 05100	5.1	5.1	52	86	37.08
M112 05200	5.2	5.2	52	86	37.08
M112 05300	5.3	5.3	52	86	37.08
M112 05400	5.4	5.4	57	93	37.08
M112 05500	5.5	5.5	57	93	36.15
M112 05600	5.6	5.6	57	93	43.26
M112 05700	5.7	5.7	57	93	43.26
M112 05800	5.8	5.8	57	93	43.26
M112 05900	5.9	5.9	57	93	43.26
M112 06000	6.0	6.0	57	93	41.72
M112 06100	6.1	6.1	63	101	53.56
M112 06200	6.2	6.2	63	101	53.56
M112 06300	6.3	6.3	63	101	53.56
M112 06400	6.4	6.4	63	101	53.56
M112 06500	6.5	6.5	63	101	51.91
M112 06600	6.6	6.6	63	101	62.83
M112 06700	6.7	6.7	63	101	62.83
M112 06800	6.8	6.8	69	109	62.83
M112 06900	6.9	6.9	69	109	62.83
M112 07000	7.0	7.0	69	109	59.64
M112 07100	7.1	7.1	69	109	70.76
M112 07200	7.2	7.2	69	109	70.76
M112 07300	7.3	7.3	69	109	70.76
M112 07400	7.4	7.4	69	109	70.76
M112 07500	7.5	7.5	69	109	66.02
M112 07600	7.6	7.6	75	117	74.68
M112 07700	7.7	7.7	75	117	74.68
M112 07800	7.8	7.8	75	117	74.68
M112 07900	7.9	7.9	75	117	74.68
M112 08000	8.0	8.0	75	117	70.76
M112 08100	8.1	8.1	75	117	91.05
M112 08200	8.2	8.2	75	117	91.05
M112 08300	8.3	8.3	75	117	91.05
M112 08400	8.4	8.4	75	117	91.05
M112 08500	8.5	8.5	75	117	82.50
M112 08600	8.6	8.6	81	125	99.70
M112 08700	8.7	8.7	81	125	99.70
M112 08800	8.8	8.8	81	125	99.70
M112 08900	8.9	8.9	81	125	99.70

CATALOGUE No.	SIZE	SHANK DIAMETER	FLUTE LENGTH	OVERALL LENGTH	PRICE £
M112 09000	9.0	9.0	81	125	99.70
M112 09100	9.1	9.1	81	125	111.76
M112 09200	9.2	9.2	81	125	111.76
M112 09300	9.3	9.3	81	125	111.76
M112 09400	9.4	9.4	81	125	111.76
M112 09500	9.5	9.5	81	125	107.64
M112 09600	9.6	9.6	87	133	124.63
M112 09700	9.7	9.7	87	133	124.63
M112 09800	9.8	9.8	87	133	124.63
M112 09900	9.9	9.9	87	133	124.63
M112 10000	10.0	10.0	87	133	116.39
M112 10200	10.2	10.2	87	133	132.87
M112 10500	10.5	10.5	87	133	132.87
M112 10800	10.8	10.8	94	142	157.59
M112 11000	11.0	11.0	94	142	157.59
M112 11500	11.5	11.5	94	142	174.07
M112 12000	12.0	12.0	101	151	198.28
M112 12500	12.5	12.5	101	151	206.52
M112 13000	13.0	13.0	101	151	214.76
M112 13500	13.5	13.5	108	160	231.24
M112 14000	14.0	14.0	108	160	248.23
M112 14500	14.5	14.5	114	169	281.71
M112 15000	15.0	15.0	114	169	297.16
M112 15500	15.5	15.5	120	178	322.39
M112 16000	16.0	16.0	120	178	347.63

For Speeds & Feeds please see pages 145.

235 Series

2 Straight Flute



Description

Solid carbide, 2 straight flute, straight shank, 140° inclusive drill point, stub length. Diameter tolerance +0.000mm - 0.013mm.

Application

235 series are designed to produce accurate holes in hardened materials. The straight flutes and stub length give exceptional rigidity and positional accuracy.

Metric & Imperial Sizes

CATALOGUE No.	M NUMBER	SIZE	FLUTE LENGTH (")	OVERALL LENGTH (")	PRICE £
235-0167-00	M43508	1,00mm	1/2	1-1/2	13.02
235-0170-00	M43509	60	1/2	1-1/2	13.02
235-0175-00	M43510	59	1/2	1-1/2	13.72
235-0180-00	M43511	58	1/2	1-1/2	13.75
235-0185-00	M43512	57	1/2	1-1/2	13.75
235-0190-00	M43513	56	1/2	1-1/2	13.75
235-0195-00	M43514	3/64"	1/2	1-1/2	13.75
235-0200-00	M43515	55	1/2	1-1/2	13.75
235-0205-00	M43516	54	1/2	1-1/2	13.75
235-0208-00	M43517	1,50mm	1/2	1-1/2	13.82
235-0210-00	M43518	53	1/2	1-1/2	13.82
235-0215-00	M43519	1/16"	5/8	1-5/8	13.82
235-0220-00	M43520	52	11/16	1-11/16	13.82
235-0225-00	M43521	51	11/16	1-11/16	13.82
235-0230-00	M43522	50	11/16	1-11/16	13.82
235-0235-00	M43523	49	11/16	1-11/16	13.82
235-0240-00	M43524	48	11/16	1-11/16	14.15
235-0245-00	M43526	5/64"	11/16	1-11/16	14.15
235-0250-00	M43527	47	3/4	1-3/4	14.15
235-0252-00	M43525	2,00mm	3/4	1-3/4	14.46
235-0255-00	M43528	46	3/4	1-3/4	14.46
235-0260-00	M43529	45	3/4	1-3/4	14.77
235-0265-00	M43530	44	3/4	1-3/4	14.77
235-0270-00	M43531	43	3/4	1-3/4	14.88
235-0275-00	M43532	42	3/4	1-3/4	15.27
235-0280-00	M43533	3/32"	3/4	1-3/4	15.55
235-0285-00	M43534	41	13/16	1-13/16	15.55
235-0290-00	M43535	40	13/16	1-13/16	15.87
235-0291-00	M43536	2,50mm	13/16	1-13/16	15.87
235-0295-00	M43537	39	13/16	1-13/16	15.87
235-0300-00	M43538	38	13/16	1-13/16	16.50
235-0305-00	M43539	37	13/16	1-13/16	17.18
235-0310-00	M43540	36	13/16	1-13/16	17.18

CATALOGUE No.	M NUMBER	SIZE	FLUTE LENGTH (")	OVERALL LENGTH (")	PRICE £
235-0315-00	M43541	7/64"	13/16	1-13/16	17.18
235-0320-00	M43542	35	13/16	1-13/16	17.18
235-0325-00	M43543	34	7/8	1-7/8	17.72
235-0330-00	M43544	33	7/8	1-7/8	17.72
235-0335-00	M43545	32	7/8	1-7/8	17.72
235-0337-00	M43546	3,00mm	7/8	1-7/8	18.00
235-0340-00	M43547	31	7/8	1-7/8	18.00
235-0345-00	M43548	1/8"	7/8	1-7/8	18.00
235-0350-00	M43549	30	15/16	1-15/16	20.06
235-0355-00	M43550	29	15/16	1-15/16	20.32
235-0357-00	M43551	3,50mm	15/16	1-15/16	21.47
235-0360-00	M43552	28	15/16	1-15/16	21.47
235-0365-00		9/64"	15/16	1-15/16	21.47
235-0370-00	M43554	27	1	2-1/16	21.63
235-0375-00	M43555	26	1	2-1/16	21.86
235-0380-00	M43556	25	1	2-1/16	22.15
235-0385-00	M43557	24	1	2-1/16	23.03
235-0390-00	M34558	23	1	2-1/16	23.45
235-0395-00	M34559	5/32"	1	2-1/16	23.45
235-0400-00	M34560	22	1-1/16	2-1/8	23.79
235-0401-00	M34561	4,00mm	1-1/16	2-1/8	24.14
235-0405-00	M34562	21	1-1/16	2-1/8	27.35
235-0410-00	M34563	20	1-1/16	2-1/8	27.35
235-0415-00	M34564	19	1-1/16	2-1/8	27.44
235-0420-00	M34565	18	1-1/16	2-1/8	27.44
235-0425-00	M34566	11/64"	1-1/16	2-1/8	27.80
235-0430-00	M34567	17	1-1/8	2-3/16	27.80
235-0435-00		16	1-1/8	2-3/16	27.80
235-0436-00	M34569	4,50mm	1-1/8	2-3/16	28.14
235-0440-00		15	1-1/8	2-3/16	28.59
235-0445-00	M34571	14	1-1/8	2-3/16	28.59
235-0450-00	M34572	13	1-1/8	2-3/16	29.00
235-0455-00	M34573	3/16"	1-1/8	2-3/16	29.00

235 Series Continued

Metric & Imperial Sizes

CATALOGUE No.	M NUMBER	SIZE	FLUTE LENGTH (")	OVERALL LENGTH (")	PRICE £
235-0460-00	M34574	12	1-3/16	2-3/16	29.36
235-0465-00	M34575	11	1-3/16	2-1/4	29.97
235-0470-00	M34576	10	1-3/16	2-1/4	30.15
235-0475-00	M34577	9	1-3/16	2-1/4	30.76
235-0476-00	M34578	5,00mm	1-3/16	2-1/4	30.76
235-0480-00	M34579	8	1-3/16	2-1/4	32.73
235-0485-00	M34580	7	1-3/16	2-1/4	32.73
235-0490-00	M34581	13/64"	1-3/16	2-1/4	32.73
235-0495-00	M34582	6	1-1/4	2-3/8	33.88
235-0500-00	M34583	5	1-1/4	2-3/8	33.88
235-0505-00	M34584	4	1-1/4	2-3/8	34.23
235-0510-00	M34585	3	1-1/4	2-3/8	36.49
235-0513-00	M34586	5,50mm	1-1/4	2-3/8	36.49
235-0515-00	M34587	7/32"	1-1/4	2-3/8	36.49
235-0520-00	M34588	2	1-5/16	2-7/16	36.49
235-0525-00	M34589	1	1-5/16	2-7/16	37.52
235-0530-00		A	1-5/16	2-7/16	40.46
235-0535-00	M34591	15/64"	1-5/16	2-7/16	40.46
235-0537-00	M34592	6,00mm	1-5/16	2-7/16	40.46
235-0540-00		B	1-3/8	2-1/2	42.26
235-0545-00		C	1-3/8	2-1/2	42.26
235-0550-00	M34595	D	1-3/8	2-1/2	44.12
235-0555-00	M34596	E & 1/4"	1-3/8	2-1/2	44.12
235-0564-00	M34597	6,50mm	1-3/8	2-1/2	46.15
235-0565-00	M34598	F	1-7/16	2-5/8	52.33
235-0570-00	M34599	G	1-7/16	2-5/8	54.75
235-0575-00	M34600	17/64"	1-7/16	2-5/8	54.75
235-0580-00	M34601	H	1-1/2	2-11/16	57.10
235-0585-00		I	1-1/2	2-11/16	57.42
235-0589-00	M34603	7,00mm	1-1/2	2-11/16	57.42
235-0590-00		J	1-1/2	2-11/16	58.82
235-0595-00		K	1-1/2	2-11/16	58.93
235-0600-00	M34606	9/32"	1-1/2	2-11/16	58.93
235-0605-00	M34607	L	1-9/16	2-3/4	63.46
235-0610-00		M	1-9/16	2-3/4	63.46
235-0611-00	M34609	7,50mm	1-9/16	2-3/4	63.46
235-0615-00	M34610	19/64"	1-9/16	2-3/4	63.46
235-0620-00		N	1-5/8	2-13/16	67.16

CATALOGUE No.	M NUMBER	SIZE	FLUTE LENGTH (")	OVERALL LENGTH (")	PRICE £
235-0625-00	M34612	5/16"	1-5/8	2-13/16	67.30
235-0628-00	M34613	8,00mm	1-5/8	2-13/16	67.16
235-0630-00		O	1-11/16	2-15/16	67.16
235-0635-00	M34615	P	1-11/16	2-15/16	67.16
235-0640-00	M34616	21/64"	1-11/16	2-15/16	67.16
235-0645-00	M34617	Q	1-11/16	3	69.97
235-0647-00	M34618	8,50mm	1-11/16	3	69.97
235-0650-00		R	1-11/16	3	69.97
235-0655-00		11/32"	1-11/16	3	76.17
235-0660-00		S	1-3/4	3-1/16	76.17
235-0663-00	M34622	9,00mm	1-3/4	3-1/16	86.16
235-0665-00		T	1-3/4	3-1/16	86.16
235-0670-00	M34624	23/64"	1-3/4	3-1/16	86.16
235-0675-00	M34625	U	1-13/16	3-1/8	86.77
235-0679-00	M34626	9,50mm	1-13/16	3-1/8	96.04
235-0680-00	M34627	3/8"	1-13/16	3-1/4	96.04
235-0685-00		V	1-7/8	3-1/4	96.04
235-0690-00	M34629	W	1-7/8	3-1/4	96.04
235-0695-00		25/64"	1-7/8	3-1/4	96.04
235-0697-00	M34631	10,0mm	1-7/8	3-1/4	98.30
235-0700-00		X	1-15/16	3-5/16	101.84
235-0705-00		Y	1-15/16	3-5/16	104.89
235-0710-00	M34634	13/32"	1-15/16	3-5/16	104.89
235-0715-00		Z	2	3-3/8	104.89
235-0716-00	M34635	10,5mm	2	3-3/8	111.68
235-0720-00		27/64"	2	3-3/8	111.68
235-0723-00	M34638	11,0mm	2-1/16	3-7/16	111.68
235-0725-00	M34639	7/16"	2-1/16	3-7/16	111.68
235-0729-00	M34640	11,5mm	2-1/8	3-9/16	127.35
235-0730-00		29/64"	2-1/8	3-9/16	127.35
235-0735-00	M34642	15/32"	2-1/8	3-5/8	145.55
235-0736-00	M34643	12,0mm	2-1/8	3-5/8	148.46
235-0740-00		31/64"	2-1/8	3-11/16	148.46

240 Series

2 Flute Slow Spiral



Description

Solid carbide, 2 flute, 15° helix, 135° inclusive four facet ground drill point, stub length.
Diameter tolerance +0.000mm - 0.013mm.

Application

240 series are designed to produce very close hole size and location, often eliminating reamer operation. No centre drilling is required. Typical materials drilled include titanium, inconel, cast iron and stainless steel.

Metric & Imperial Sizes

CATALOGUE No.	M NUMBER	SIZE	FLUTE LENGTH (")	OVERALL LENGTH (")	PRICE £
240-0167-00	M43686	1,00mm	1/2	1-1/2	14.58
240-0186-00	M43304	1,10mm	1/2	1-1/2	14.58
240-0195-00		3/64"	1/2	1-1/2	14.58
240-0196-00	M43305	1,20mm	1/2	1-1/2	14.58
240-0198-00	M43306	1,30mm	1/2	1-1/2	14.58
240-0206-00	M43307	1,40mm	1/2	1-1/2	14.58
240-0208-00	M43308	1,50mm	1/2	1-1/2	13.80
240-0210-00	M43309	53	1/2	1-1/2	13.80
240-0215-00	M43310	1/16"	5/8	1-5/8	13.37
240-0217-00	M43311	1,60mm	5/8	1-5/8	13.37
240-0220-00	M43312	52	11/16	1-11/16	13.37
240-0223-00	M43313	1,70mm	11/16	1-11/16	13.37
240-0225-00	M43314	51	11/16	1-11/16	13.37
240-0230-00	M43315	50	11/16	1-11/16	13.64
240-0232-00	M43316	1,80mm	11/16	1-11/16	14.08
240-0235-00	M43317	49	11/16	1-11/16	14.08
240-0237-00	M43318	1,90mm	11/16	1-11/16	14.26
240-0240-00	M43319	48	11/16	1-11/16	14.26
240-0245-00	M43321	5/64"	11/16	1-11/16	14.26
240-0250-00	M43322	47	3/4	1-3/4	14.26
240-0252-00	M43320	2,00mm	3/4	1-3/4	14.59
240-0255-00	M43323	46	3/4	1-3/4	14.59
240-0260-00	M43324	45	3/4	1-3/4	14.59
240-0261-00	M43325	2,10mm	3/4	1-3/4	14.59
240-0265-00	M43326	44	3/4	1-3/4	14.77
240-0267-00	M43327	2,20mm	3/4	1-3/4	15.12
240-0270-00	M43328	43	3/4	1-3/4	15.12
240-0272-00	M43329	2,30mm	3/4	1-3/4	15.27
240-0275-00	M43330	42	3/4	1-3/4	15.27
240-0280-00	M43331	3/32"	3/4	1-3/4	15.27
240-0282-00	M43332	2,40mm	13/16	1-13/16	15.87
240-0285-00	M43333	41	13/16	1-13/16	15.87
240-0290-00	M43334	40	13/16	1-13/16	15.87
240-0291-00	M43335	2,50mm	13/16	1-13/16	15.87
240-0295-00	M43336	39	13/16	1-13/16	15.87

CATALOGUE No.	M NUMBER	SIZE	FLUTE LENGTH (")	OVERALL LENGTH (")	PRICE £
240-0300-00	M43337	38	13/16	1-13/16	16.50
240-0302-00	M43338	2,60mm	13/16	1-13/16	16.59
240-0305-00	M43339	37	13/16	1-13/16	16.59
240-0309-00	M43340	2,70mm	13/16	1-13/16	17.72
240-0310-00	M43341	36	13/16	1-13/16	16.84
240-0315-00	M43342	7/64"	13/16	1-13/16	16.84
240-0320-00	M43343	35	7/8	1-7/8	17.18
240-0321-00	M43344	2,80mm	7/8	1-7/8	17.72
240-0325-00		34	7/8	1-7/8	17.72
240-0330-00	M43346	33	7/8	1-7/8	17.72
240-0332-00	M43347	2,90mm	7/8	1-7/8	18.50
240-0335-00	M43348	32	7/8	1-7/8	18.50
240-0337-00	M43349	3,00mm	7/8	1-7/8	18.50
240-0340-00	M43350	31	7/8	1-7/8	18.50
240-0342-00	M43351	3,10mm	7/8	1-7/8	18.50
240-0345-00	M43352	1/8"	7/8	1-7/8	18.50
240-0346-00	M43353	3,20mm	15/16	1-15/16	20.06
240-0350-00	M43354	30	15/16	1-15/16	20.06
240-0351-00	M43355	3,30mm	15/16	1-15/16	20.85
240-0353-00	M43356	3,40mm	15/16	1-15/16	20.91
240-0355-00	M43357	29	15/16	1-15/16	20.91
240-0357-00	M43358	3,50mm	15/16	1-15/16	20.91
240-0360-00	M43359	28	15/16	1-15/16	20.91
240-0365-00	M43360	9/64"	15/16	1-15/16	20.91
240-0367-00	M43361	3,60mm	15/16	1-15/16	21.21
240-0370-00	M43362	27	1	2-1/16	21.63
240-0373-00	M43363	3,70mm	1	2-1/16	21.79
240-0375-00		26	1	2-1/16	21.86
240-0380-00	M43365	25	1	2-1/16	22.07
240-0381-00	M43366	3,80mm	1	2-1/16	23.03
240-0385-00	M43357	24	1	2-1/16	23.03

240 Series Continued

Metric & Imperial Sizes

CATALOGUE No.	M NUMBER	SIZE	FLUTE LENGTH (")	OVERALL LENGTH (")	PRICE £
240-0410-00	M43374	20	1-1/16	2-1/8	27.35
240-0411-00	M43375	4,10mm	1-1/16	2-1/8	27.35
240-0414-00	M43376	4,20mm	1-1/16	2-1/8	27.35
240-0415-00	M43377	19	1-1/16	2-1/8	27.35
240-0419-00	M43378	4,30mm	1-1/16	2-1/8	27.44
240-0420-00	M43379	18	1-1/16	2-1/8	27.44
240-0425-00	M43380	11/64"	1-1/16	2-1/8	27.80
240-0430-00	M43381	17	1-1/8	2-3/16	27.80
240-0431-00	M43382	4,40mm	1-1/8	2-3/16	28.43
240-0435-00	M43383	16	1-1/8	2-3/16	28.43
240-0436-00	M43384	4,50mm	1-1/8	2-3/16	28.43
240-0440-00	M43385	15	1-1/8	2-3/16	28.43
240-0443-00	M43386	4,60mm	1-1/8	2-3/16	28.43
240-0445-00	M43387	14	1-1/8	2-3/16	28.43
240-0450-00	M43388	13	1-1/8	2-3/16	28.83
240-0455-00	M43390	3/16"	1-1/8	2-3/16	28.83
240-0460-00	M43391	12	1-3/16	2-1/4	29.36
240-0465-00	M43393	11	1-3/16	2-1/4	29.88
240-0469-00	M43394	4,90mm	1-3/16	2-1/4	30.20
240-0470-00	M43395	10	1-3/16	2-1/4	30.20
240-0475-00	M43396	9	1-3/16	2-1/4	31.45
240-0476-00	M43397	5,00mm	1-3/16	2-1/4	31.45
240-0480-00	M43398	8	1-3/16	2-1/4	31.45
240-0484-00	M43399	5,10mm	1-3/16	2-1/4	32.05
240-0485-00	M43400	7	1-3/16	2-1/4	32.13
240-0490-00	M43401	13/64"	1-3/16	2-1/4	32.39
240-0495-00	M43402	6	1-1/4	2-3/8	34.23
240-0497-00	M43403	5,20mm	1-1/4	2-3/8	34.23
240-0500-00	M43404	5	1-1/4	2-3/8	34.23
240-0504-00	M43405	5,30mm	1-1/4	2-3/8	34.23
240-0505-00	M43406	4	1-1/4	2-3/8	34.23
240-0509-00	M43407	5,40mm	1-1/4	2-3/8	37.70
240-0510-00	M43408	3	1-1/4	2-3/8	37.70
240-0513-00	M43409	5,50mm	1-1/4	2-3/8	37.70
240-0515-00	M43410	7/32"	1-1/4	2-3/8	37.70
240-0519-00	M43411	5,60mm	1-1/4	2-3/8	38.20
240-0520-00	M43412	2	1-5/16	2-7/16	38.29
240-0522-00	M43413	5,70mm	1-5/16	2-7/16	38.29
240-0525-00	M43414	1	1-5/16	2-7/16	38.29
240-0526-00		5,80mm	1-5/16	2-7/16	39.94
240-0529-00	M43416	5,90mm	1-5/16	2-7/16	39.94
240-0530-00	M43417	A	1-5/16	2-7/16	39.94
240-0535-00	M43418	15/64"	1-5/16	2-7/16	40.65
240-0537-00	M43419	6,00mm	1-5/16	2-7/16	40.93
240-0540-00	M43420	B	1-3/8	2-1/2	41.94
240-0544-00	M43421	6,10mm	1-3/8	2-1/2	42.37
240-0545-00	M43422	C	1-3/8	2-1/2	42.37
240-0548-00	M43423	6,20mm	1-3/8	2-1/2	42.37
240-0550-00	M43424	D	1-3/8	2-1/2	42.37
240-0553-00	M43425	6,30mm	1-3/8	2-1/2	42.37
240-0555-00	M43426	E & 1/4"	1-3/8	2-1/2	42.37
240-0557-00	M43427	6,40mm	1-3/8	2-1/2	47.76
240-0564-00	M43428	6,50mm	1-3/8	2-1/2	47.76
240-0565-00	M43429	F	1-7/16	2-5/8	47.76
240-0567-00	M43430	6,60mm	1-7/16	2-5/8	52.12
240-0570-00	M43431	G	1-7/16	2-5/8	52.03

CATALOGUE No.	M NUMBER	SIZE	FLUTE LENGTH (")	OVERALL LENGTH (")	PRICE £
240-0573-00	M43432	6,70mm	1-7/16	2-5/8	52.03
240-0575-00	M43433	17/64"	1-7/16	2-5/8	53.33
240-0580-00	M43434	H	1-1/2	2-11/16	53.33
240-0582-00	M43435	6,80mm	1-1/2	2-11/16	53.33
240-0583-00	M43436	6,90mm	1-1/2	2-11/16	53.33
240-0585-00	M43437	I	1-1/2	2-11/16	53.33
240-0589-00	M43438	7,00mm	1-1/2	2-11/16	53.33
240-0590-00	M43439	J	1-1/2	2-11/16	54.27
240-0595-00	M43440	K	1-1/2	2-11/16	56.18
240-0600-00	M43441	9/32"	1-1/2	2-11/16	56.18
240-0605-00	M43442	L	1-9/16	2-3/4	61.99
240-0610-00	M43443	M	1-9/16	2-3/4	64.01
240-0611-00	M43444	7,50mm	1-9/16	2-3/4	64.01
240-0615-00	M43445	19/64"	1-9/16	2-3/4	64.01
240-0620-00	M43446	N	1-5/8	2-13/16	64.25
240-0625-00	M43447	5/16"	1-5/8	2-13/16	64.25
240-0628-00	M43448	8,00mm	1-5/8	2-13/16	64.52
240-0630-00	M43449	O	1-11/16	2-15/16	65.99
240-0635-00	M43450	P	1-11/16	2-15/16	66.86
240-0640-00	M43451	21/64"	1-11/16	2-15/16	66.86
240-0645-00		Q	1-11/16	3	70.60
240-0647-00	M43453	8,50mm	1-11/16	3	70.60
240-0650-00	M43454	R	1-11/16	3	72.36
240-0655-00	M43455	11/32"	1-11/16	3	73.28
240-0660-00	M43456	S	1-3/4	3-1/16	75.52
240-0663-00	M43457	9,00mm	1-3/4	3-1/16	82.50
240-0665-00	M43458	T	1-3/4	3-1/16	82.75
240-0670-00	M43459	23/64"	1-3/4	3-1/16	82.85
240-0675-00	M43460	U	1-13/16	3-1/8	86.67
240-0679-00	M43461	9,50mm	1-13/16	3-1/8	89.37
240-0680-00	M43462	3/8"	1-13/16	3-1/8	89.37
240-0685-00	M43463	V	1-7/8	3-1/4	89.37
240-0690-00	M43464	W	1-7/8	3-1/4	91.83
240-0695-00	M43465	25/64"	1-7/8	3-1/4	96.27
240-0697-00	M43466	10,0mm	1-7/8	3-1/4	100.03
240-0700-00	M43467	X	1-15/16	3-5/16	100.03
240-0705-00		Y	1-15/16	3-5/16	107.50
240-0710-00	M43469	13/32"	1-15/16	3-5/16	107.50
240-0715-00	M43470	Z	2	3-3/8	109.00
240-0716-00	M43471	10,5mm	2	3-3/8	111.61
240-0720-00	M43472	27/64"	2	3-3/8	111.94
240-0723-00	M43473	11,0mm	2-1/16	3-7/16	120.96
240-0725-00	M43474	7/16"	2-1/16	3-7/16	120.96
240-0729-00	M43475	11,5mm	2-1/8	3-9/16	142.23
240-0730-00		29/64"	2-1/8	3-9/16	142.23
240-0735-00	M43477	15/32"	2-1/8	3-5/8	142.23
240-0736-00	M43478	12,0mm	2-1/8	3-5/8	146.06
240-0740-00	M43479	31/64"	2-3/16	3-11/16	148.84
240-0745-00	M43480	1/2"	2-1/4	3-3/4	148.84
240-0765-00	M43481	9/16"	2-1/2	4	208.34
240-0785-00	M43482	5/8"	2-3/4	4-1/4	253.06
240-0825-00	M43483	3/4"	3-1/8	5	336.58

For Speeds & Feeds please see pages 145.

265 Series

2 Flute Miniature Drill



Description

Solid carbide, 2 flute, 130° inclusive drill point, 38mm overall length, 1/8" diameter shank.

Application

265 series miniature drills are designed to drill extremely small close tolerance holes in a variety of materials. Common shank size gives extra rigidity.

Metric & Imperial Sizes

CATALOGUE No.	SIZE	DECIMAL EQUIVALENT	FLUTE LENGTH	PRICE £
265-0026-00	97	.0059	7/64	43.24
265-0028-00	96	.0063	7/64	43.24
265-0030-00	95	.0067	7/64	43.24
265-0032-00	94	.0071	7/64	43.24
265-0034-00	93	.0075	7/64	43.24
265-0036-00	92	.0079	1/8	26.94
265-0038-00	91	.0083	1/8	26.94
265-0040-00	90	.0087	1/8	26.94
265-0042-00	89	.0091	1/8	24.14
265-0044-00	88	.0095	1/8	24.14
265-0045-00	0,25mm	.0098	1/8	24.14
265-0046-00	87	.0100	5/32	24.14
265-0048-00	86	.0105	5/32	24.14
265-0050-00	85	.0110	5/32	19.11
265-0052-00	84	.0115	5/32	19.11
265-0054-00	0,30mm	.0118	3/16	19.11
265-0055-00	83	.0120	3/16	19.11
265-0056-00	82	.0125	3/16	19.11
265-0058-00	81	.0130	3/16	19.11
265-0060-00	80	.0135	3/16	12.24
265-0062-00	0,35mm	.0138	3/16	12.24
265-0065-00	79	.0145	3/16	12.24
265-0070-00	1/64"	.0156	3/16	12.24
265-0073-00	0,40mm	.0158	3/16	12.24
265-0075-00	78	.0160	3/16	9.04

CATALOGUE No.	SIZE	DECIMAL EQUIVALENT	FLUTE LENGTH	PRICE £
265-0078-00	0,45mm	.0177	3/16	9.04
265-0080-00	77	.0180	3/16	9.04
265-0083-00	0,50mm	.0197	3/16	9.04
265-0085-00	76	.0200	3/16	9.04
265-0090-00	75	.0210	3/16	9.04
265-0093-00	0,55mm	.0217	3/16	7.66
265-0095-00	74	.0225	3/16	7.66
265-0098-00	0,60mm	.0236	7/32	7.66
265-0100-00	73	.0240	7/32	7.66
265-0105-00	72	.0250	7/32	7.66
265-0108-00	0,65mm	.0256	7/32	7.66
265-0110-00	71	.0260	7/32	7.66
265-0113-00	0,70mm	.0276	1/4	6.44
265-0115-00	70	.0280	3/8	6.44
265-0120-00	69	.0292	3/8	6.44
265-0122-00	0,75mm	.0295	3/8	6.44
265-0125-00	68	.0310	3/8	6.44
265-0130-00	1/32"	.0312	3/8	6.44
265-0132-00	0,80mm	.0315	3/8	6.44
265-0135-00	67	.0320	3/8	6.44
265-0140-00	66	.0330	3/8	6.44
265-0141-00	0,85mm	.0335	3/8	6.44
265-0145-00	65	.0350	3/8	6.44
265-0147-00	0,90mm	.0354	3/8	6.44
265-0150-00	64	.0360	3/8	6.44

For Speeds & Feeds please see pages 145.

265 Series Continued

Metric & Imperial Sizes

CATALOGUE No.	SIZE	DECIMAL EQUIVALENT	FLUTE LENGTH	PRICE £
265-0155-00	63	.0370	3/8	6.44
265-0156-00	0,95mm	.0374	3/8	6.44
265-0160-00	62	.0380	3/8	6.44
265-0165-00	61	.0390	3/8	6.44
265-0167-00	1,00mm	.0394	3/8	6.44
265-0170-00	60	.0400	3/8	6.44
265-0175-00	59	.0410	3/8	6.44
265-0176-00	1,05mm	.0413	3/8	6.44
265-0180-00	58	.0420	3/8	6.44
265-0185-00	57	.0430	3/8	6.44
265-0186-00	1,10mm	.0433	3/8	6.44
265-0188-00	1,15mm	.0453	3/8	6.44
265-0190-00	56	.0465	3/8	6.44
265-0195-00	3/64"	.0469	3/8	6.44
265-0196-00	1,20mm	.0472	3/8	6.44
265-0197-00	1,25mm	.0492	3/8	6.44
265-0198-00	1,30mm	.0512	3/8	6.44
265-0200-00	55	.0520	3/8	6.44
265-0202-00	1,35mm	.0531	3/8	6.44
265-0205-00	54	.0550	3/8	6.44
265-0206-00	1,40mm	.0551	3/8	6.44
265-0207-00	1,45mm	.0571	3/8	6.44
265-0208-00	1,50mm	.0591	3/8	6.44
265-0210-00	53	.0595	3/8	6.44
265-0212-00	1,55mm	.0610	3/8	7.21
265-0215-00	1/16"	.0625	3/8	7.21
265-0217-00	1,60mm	.0630	3/8	7.21
265-0220-00	52	.0635	3/8	7.21
265-0222-00	1,65mm	.0650	3/8	7.21
265-0223-00	1,70mm	.0669	3/8	7.21
265-0225-00	51	.0670	3/8	7.21
265-0227-00	1,75mm	.0689	3/8	7.21
265-0230-00	50	.0700	3/8	7.21
265-0232-00	1,80mm	.0709	3/8	7.29
265-0233-00	1,85mm	.0728	3/8	7.29
265-0235-00	49	.0730	3/8	7.82
265-0237-00	1,90mm	.0748	3/8	7.82
265-0240-00	48	.0760	3/8	7.82
265-0242-00	1,95mm	.0768	3/8	7.82
265-0245-00	5/64"	.0781	3/8	7.82
265-0250-00	47	.0785	3/8	7.82
265-0252-00	2,00mm	.0787	3/8	7.82

CATALOGUE No.	SIZE	DECIMAL EQUIVALENT	FLUTE LENGTH	PRICE £
265-0254-00	2,05mm	.0807	3/8	7.82
265-0255-00	46	.0810	3/8	7.82
265-0260-00	45	.0820	3/8	7.82
265-0261-00	2,10mm	.0827	3/8	7.82
265-0262-00	2,15mm	.0846	3/8	7.82
265-0265-00	44	.0860	3/8	7.82
265-0267-00	2,20mm	.0866	3/8	7.82
265-0269-00	2,25mm	.0886	3/8	7.82
265-0270-00	43	.0890	3/8	7.82
265-0272-00	2,30mm	.0906	3/8	7.82
265-0274-00	2,35mm	.0952	3/8	7.82
265-0275-00	42	.0935	3/8	7.82
265-0280-00	3/32"	.0938	3/8	7.82
265-0282-00	2,40mm	.0945	3/8	7.82
265-0285-00	41	.0960	3/8	7.82
265-0286-00	2,45mm	.0965	3/8	7.82
265-0290-00	40	.0980	3/8	7.82
265-0291-00	2,50mm	.0984	3/8	7.82
265-0295-00	39	.0995	3/8	7.82
265-0297-00	2,55mm	.1004	3/8	7.82
265-0300-00	38	.1015	3/8	7.82
265-0302-00	2,60mm	.1024	3/8	7.82
265-0305-00	37	.1040	3/8	7.82
265-0306-00	2,65mm	.1043	3/8	7.82
265-0309-00	2,70mm	.1063	3/8	7.82
265-0310-00	36	.1065	3/8	7.82
265-0313-00	2,75mm	.1083	3/8	7.82
265-0315-00	7/64"	.1094	3/8	7.82
265-0320-00	35	.1100	3/8	7.82
265-0321-00	2,80mm	.1102	3/8	7.82
265-0325-00	34	.1110	3/8	7.82
265-0328-00	2,85mm	.1122	3/8	7.82
265-0330-00	33	.1130	3/8	7.82
265-0332-00	2,90mm	.1142	3/8	7.82
265-0335-00	32	.1160	3/8	7.82
265-0336-00	2,95mm	.1161	3/8	7.82
265-0337-00	3,00mm	.1181	3/8	7.82
265-0340-00	31	.1200	3/8	7.82
265-0341-00	3,05mm	.1201	3/8	7.82
265-0342-00	3,10mm	.1220	3/8	7.82
265-0344-00	3,15mm	.1240	3/8	7.82
265-0345-00	1/8"	.1250	3/8	7.82

For Speeds & Feeds please see pages 145.

Speeds and feeds

Carbide Uncoated

MATERIAL GROUP	RECOMMENDED DRILL SERIES	SURFACE SPEED METRES/MIN	FEED (mm/REV) DRILL DIAMETER					
			1.5mm	3mm	6mm	12mm	20mm	25mm
Aluminium Low <8% Silicon	M112 / 225	70-250	0.025	0.050	0.08	0.08		
	240		0.05	0.100	0.20	0.330		
	265		0.025	0.050	-	-		
Aluminium High >8% Silicon	M112 / 225	60-175	0.025	0.050	0.08	0.08		
	240		0.05	0.100	0.20	0.330		
	265		0.025	0.050	-	-		
Brass and Bronze	M112 / 225	50-120	0.013	0.025	0.050	0.100		
	235		0.04	0.08	0.100	0.250		
	240		0.013	0.025	0.05	0.10		
Copper and Copper Alloys	M112 / 225	80-120	0.025	0.08	0.13	0.15		
	240		0.08	0.13	0.300	0.35		
	265		0.025	0.08	-	-		
Cast Iron (Soft) 120-220 Bhn	M112 / 225	55-110	0.025	0.050	0.100	0.13	0.18	0.25
	235		0.050	0.100	0.200	0.250	0.300	0.35
	240		0.050	0.100	0.200	0.250	0.300	0.35
Cast Iron (Hard) 220-320 Bhn	M112 / 225	50-70	0.04	0.025	0.050	0.08	0.100	0.13
	235		0.050	0.08	0.100	0.18	0.200	0.25
	240		0.050	0.08	0.100	0.18	0.200	0.25
Ductile Iron	235	35-65	0.025	0.050	0.08	0.13	0.15	0.18
	240		0.050	0.100	0.15	0.20	0.200	0.380
Malleable Iron	235	50-65	0.025	0.050	0.08	0.13	0.15	0.18
			0.050	0.13	0.15	0.300	0.35	0.380
Magnesium and Magnesium Alloys	M112 / 225	65-190	0.04	0.08	0.13	0.200		
	240		0.08	0.18	0.300	0.380		
Hi Temp Alloy-Nickel Steels	235	10-15	0.010	0.02	0.025	0.04	0.050	0.07
	240		0.025	0.08	0.100	0.13	0.15	0.18
Monel-High Nickel Steels	235	10-15	0.012	0.02	0.025	0.04	0.050	0.07
	240		0.025	0.050	0.08	0.100	0.12	0.15
Plastics-Glass Filled	M112 / 225	85-150	0.025	0.050	0.08	0.13		
	240		0.050	0.100	0.15	0.300		
	265		0.025	0.05				
Plastics	M112 / 225	75-200	0.04	0.09	0.13	0.15		
	240		0.08	0.13	0.300	0.400		
	265		0.04	0.09	-	-		
Low Carbon Steels Annealed	235	50-70	0.013	0.025	0.050	0.100	0.13	0.15
	240		0.04	0.08	0.13	0.23	0.250	0.300
Medium Carbide Steel 275-425 Bhn	235	20-40	0.013	0.025	0.050	0.08	0.100	0.100
	240		0.025	0.050	0.100	0.200	0.230	0.250
Hardened Steels 48-52 Rc "C"	235	10-20	0.013	0.025	0.050	0.08	0.100	0.100
	240		0.025	0.08	0.09	0.13	0.15	0.18
Stainless Steel Soft 135-275 Bhn	235	20-40	0.012	0.05	0.050	0.100	0.13	0.15
	240		0.025	0.08	0.15	0.18	0.200	0.25
	M112 / 225		0.012	0.012	0.050	0.10	-	-
	265		0.012	0.012	0.050	0.10	-	-
Stainless Steel Hard 275-425 Bhn	235	20-50	0.012	0.012	0.025	0.04	0.050	0.07
	240		0.025	0.050	0.08	0.100	0.15	0.18
Titanium (Soft)	235	20-40	0.012	0.050	0.100	0.13	0.15	0.18
	240		0.050	0.100	0.18	0.23	0.25	0.30
Titanium (Hard)	235	15-30	0.012	0.0250	0.050	0.100	0.100	0.13
	240		0.025	0.08	0.13	0.23	0.25	0.28
Hi Temp Alloy-Nickel Steels	235	20-70	0.012	0.012	0.050	0.100	0.13	0.13
	240		0.025	0.08	0.15	0.25	0.30	0.30

Speeds and feeds

Carbide Coated 1031 Series

MATERIAL GROUP	SURFACE SPEED METRES/ MIN	FEED (mm/REV) DRILL DIAMETER							
		3mm	4mm	6mm	8mm	10mm	12mm	16mm	20mm
Steel & Alloyed Steel	30-45	0.03-0.04	0.04-0.06	0.06-0.1	0.1-0.12	0.12-0.15	0.15-0.18	0.18-0.2	0.2-0.22
Stainless Steel	25-35	0.03-0.04	0.04-0.06	0.06-0.1	0.1-0.12	0.12-0.15	0.15-0.18	0.18-0.2	0.2-0.22
Cast Iron	90-120	0.1-0.15	0.15-0.2	0.2-0.25	0.25-0.28	0.28-0.3	0.3-0.33	0.33-0.36	0.36-0.38
Aluminium	100-200	0.1-0.15	0.15-0.2	0.2-0.25	0.25-0.28	0.28-0.3	0.3-0.33	0.33-0.36	0.36-0.38
Titanium & High Temperature Alloys	30-50	0.05-0.1	0.1-0.16	0.16-0.18	0.18-0.2	0.2-0.22	0.22-0.24	0.24-0.26	0.26-0.28

Carbide Coated through Coolant 1032, 1052, 1082 Series

MATERIAL GROUP	SURFACE SPEED METRES/ MIN	FEED (mm/REV) DRILL DIAMETER							
		3mm	4mm	6mm	8mm	10mm	12mm	16mm	20mm
Steel & Alloyed Steel	35-60	0.03-0.04	0.04-0.06	0.06-0.1	0.1-0.12	0.12-0.15	0.15-0.18	0.18-0.2	0.2-0.22
Stainless Steel	25-40	0.03-0.04	0.04-0.06	0.06-0.1	0.1-0.12	0.12-0.15	0.15-0.18	0.18-0.2	0.2-0.22
Cast Iron	90-150	0.1-0.15	0.15-0.2	0.2-0.25	0.25-0.28	0.28-0.3	0.3-0.33	0.33-0.36	0.36-0.38
Aluminium	100-250	0.1-0.15	0.15-0.2	0.2-0.25	0.25-0.28	0.28-0.3	0.3-0.33	0.33-0.36	0.36-0.38
Titanium & High Temperature Alloys	30-65	0.05-0.1	0.1-0.16	0.16-0.18	0.18-0.2	0.2-0.22	0.22-0.24	0.24-0.26	0.26-0.28

General Machine Guidelines

1. Higher feed and speed values should be favoured for softer materials; lower feed and speed values should be used on harder materials.
2. The above recommendations are for hole depths up to 2 drill diameters. When hole depths run 3 to 6 diameters, speeds should be reduced 10% to 35% respectively and feeds should be reduced 10% to 20%, respectively.

Useful Formulas

Formulas for Drilling

$$\text{Cutting Speed } V_c = \frac{D_t \times \pi \times \text{rpm}}{1000}$$

$$\text{Revolutions per min (rpm)} = \frac{V_c \times 1000}{\pi \times D_t}$$

$$\text{Feed Rate } f_m \text{ mm/min} = f_r \times \text{rpm}$$

$$\text{Feed per rev } f_r = \frac{f_m}{\text{rpm}}$$

Symbols

$$\text{Drill Diameter mm} = D_t$$

$$\text{Revolutions / min} = \text{rpm}$$

$$\text{Cutting Speed m/min} = V_c$$

$$\text{Feed m/m per rev} = f_r$$

$$\text{Feed m/m per min} = f_m$$

250 Series

Centre Drills



Description

Solid carbide, 2 flute, double ended, 118° inclusive drill point.

Application

Designed to give accurate hole starting and counter sinking in difficult to machine materials.

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	TOOL	BODY DIAMETER	DRILL DIAMETER	OVERALL LENGTH	PRICE £
250-0010-00	M40599	1	1/8	3/64	1-1/2	22.28
250-0020-00	M40600	2	3/16	5/64	1-7/8	34.34
250-0030-00	M40601	3	1/4	7/64	2	38.92
250-0040-00	M40602	4	5/16	1/8	2-1/8	53.01
250-0050-00	M40603	5	7/16	3/16	2-3/4	81.68
250-0060-00	M40604	6	1/2	7/32	2	107.60

Metric Sizes (mm)

CATALOGUE No.	M NUMBER	BODY DIAMETER	DRILL DIAMETER	OVERALL LENGTH	LENGTH OF CUT	PRICE £
250-0500-00*		3	0,500	25	0.8	39.71
250-0800-00*		3	0,800	25	1.1	39.71
250-1000-00		3	1,000	32	1.3	54.06
250-1250-00		3	1,250	32	1.6	54.06
250-1600-00		4	1,600	36	2.0	54.06
250-2000-00		5	2,000	40	2.5	62.96
250-2500-00		6	2,500	45	3.1	70.08
250-3150-00		8	3,150	50	3.9	84.54
250-4000-00		10	4,000	56	5.0	103.62
250-5000-00		13	5,000	63	6.3	153.29
250-6300-00		16	6,300	71	8.0	221.37

* N.B. Drill diameters 0.5mm and 0.8mm are single ended.

400 Series

NC Spotting Drill



Description

Solid carbide, strong web construction, short flute for rigidity. Available in both 90° and 120° inclusive angles.

Application

ITC's NC Spotting Drills are manufactured from micrograin carbide, to provide maximum durability in spotting and chamfering operations. May be used with a variety of materials including steels, high temp alloys, aluminiums etc.

Metric Sizes (mm) - 90 Degree

CATALOGUE No.	SIZE	OVERALL LENGTH	LENGTH OF CUT	PRICE £
400-1181-90	3	45	12	19.03
400-1575-90	4	50	15	23.24
400-1969-90	5	50	18	24.85
400-2362-90	6	50	21	34.02
400-3150-90	8	60	25	47.35
400-3937-90	10	70	27	72.53
400-4724-90	12	70	27	95.02
400-6299-90	16	75	30	136.90
400-7874-90	20	100	33	209.34

Metric Sizes (mm) - 120 Degree

CATALOGUE No.	SIZE	OVERALL LENGTH	LENGTH OF CUT	PRICE £
400-1181-120	3	45	12	19.03
400-1575-120	4	50	15	23.24
400-1969-120	5	50	18	24.85
400-2362-120	6	50	21	34.02
400-3150-120	8	60	25	47.35
400-3937-120	10	70	27	72.53
400-4724-120	12	70	27	95.02
400-6299-120	16	75	30	136.90
400-7874-120	20	100	33	209.34

N.B. Other sizes and angles available on request.

012611 Series

NC Spotting Drill - Long Series



Description

Solid carbide, strong web construction, short flute for rigidity. 90° inclusive angle, long overall length

Application

ITC's NC Spotting Drills are manufactured from micrograin carbide, to provide maximum durability in spotting and chamfering operations. May be used with a variety of materials including steels, high temp alloys, aluminiums etc.

Metric Sizes (mm) - 90 Degree

CATALOGUE No.	SIZE	OVERALL LENGTH	LENGTH OF CUT	PRICE £
012611-000050	5	62	10	37.58
012611-000060	6	66	15	37.58
012611-000080	8	79	17	61.91
012611-000100	10	89	20	88.40
012611-000120	12	102	25	117.65
012611-000160	16	115	35	210.98
012611-000200	20	131	40	308.00

208 Series

Carbide Reamer



Description

Solid carbide, right hand spiral or straight flute, right hand cut. Sizes up to 0.191" have 4 flutes. Larger reamers have 6 flutes.

Application

Designed to give extremely tight hole tolerances in a variety of materials.

Imperial Sizes (inches)

CATALOGUE No.	SIZE (")	METRIC EQUIVALENT	FLUTE LENGTH (")	OVERALL LENGTH (")	SHANK DIAMETER (")	PRICE £
208-1094-30	7/64	2.78mm	5/8	2-1/4	.0938	40.40
208-1250-30	1/8	3.18mm	5/8	2-1/4	.1094	42.81
208-1406-30	9/64	3.57mm	3/4	2-1/2	.1250	44.48
208-1563-30	5/32	3.97mm	3/4	2-1/2	.1406	49.35
208-1719-30	11/64	4.34mm	7/8	2-3/4	.1562	53.07
208-1875-30	3/16	4.77mm	7/8	2-3/4	.1719	55.65
208-2031-30	13/64	5.16mm	1	3	.1875	65.83
208-2188-30	7/32	5.56mm	1	3	.1875	65.83
208-2344-30	15/64	5.95mm	1	3	.2188	77.13
208-2500-30	1/4	6.35mm	1	3	.2188	77.13
208-2656-30	17/64	6.75mm	1-1/8	3-1/4	.2500	94.28
208-2850-30	9/32	7.15mm	1-1/8	3-1/4	.2500	94.28
208-2969-30	19/64	7.54mm	1-1/8	3-1/4	.2812	103.32
208-3125-30	5/16	7.94mm	1-1/8	3-1/4	.2812	103.32
208-3281-30	21/64	8.33mm	1-1/4	3-1/2	.3125	114.86
208-3630-30	11/32	8.73mm	1-1/4	3-1/2	.3125	114.86
208-3594-30	23/64	9.13mm	1-1/4	3-1/2	.3443	114.86
208-3860-30	3/8	9.53mm	1-1/4	3-1/2	.3443	125.42

Note: Reamers are furnished to **+.0003" - .0000"**

(+0.008mm - 0.000mm) tolerance unless otherwise specified.

Most commonly stocked style is R.H.S (-30).

Other sizes and styles are available on request.

* Special diameter reamers are available on express turnaround from our MOD shop.

-10	=	Straight Flute
-30	=	Right Hand Spiral

For Speeds & Feeds please see pages 155.

208 Series

Continued

Metric Sizes (mm)

CATALOGUE No.	SIZE	FLUTE LENGTH	OVERALL LENGTH	SHANK DIAMETER	PRICE £
208-0024-30	2.4mm	12.5mm	57mm	1.98mm	37.03
208-0025-30	2.5mm	16mm	57mm	2.38mm	40.40
208-0026-30	2.6mm	16mm	57mm	2.38mm	40.40
208-0027-30	2.7mm	16mm	57mm	2.38mm	40.40
208-0028-30	2.8mm	16mm	57mm	2.38mm	40.40
208-0029-30	2.9mm	16mm	57mm	2.38mm	40.40
208-0030-30	3.0mm	16mm	57mm	2.78mm	42.81
208-0031-30	3.1mm	16mm	57mm	2.78mm	42.81
208-0032-30	3.2mm	16mm	57mm	2.78mm	42.81
208-0033-30	3.3mm	19mm	63mm	3.18mm	44.48
208-0034-30	3.4mm	19mm	63mm	3.18mm	44.48
208-0035-30	3.5mm	19mm	63mm	3.18mm	44.48
208-0036-30	3.6mm	19mm	63mm	3.18mm	44.48
208-0037-30	3.7mm	19mm	63mm	3.57mm	49.35
208-0038-30	3.8mm	19mm	63mm	3.57mm	49.35
208-0039-30	3.9mm	19mm	63mm	3.57mm	49.35
208-0040-30	4.0mm	19mm	63mm	3.57mm	49.35
208-0041-30	4.1mm	22mm	70mm	3.57mm	53.07
208-0042-30	4.2mm	22mm	70mm	3.57mm	53.07
208-0043-30	4.3mm	22mm	70mm	3.57mm	53.07
208-0044-30	4.4mm	22mm	70mm	3.57mm	53.07
208-0045-30	4.5mm	22mm	70mm	4.37mm	55.65
208-0046-30	4.6mm	25mm	75mm	4.77mm	55.65
208-0047-30	4.7mm	25mm	75mm	4.77mm	55.65
208-0048-30	4.8mm	25mm	75mm	4.77mm	55.65
208-0049-30	4.9mm	25mm	75mm	4.77mm	65.83
208-0050-30	5.0mm	25mm	75mm	4.77mm	55.65
208-0051-30	5.1mm	25mm	75mm	4.77mm	55.65
208-0052-30	5.2mm	25mm	75mm	4.77mm	55.65
208-0053-30	5.3mm	25mm	75mm	4.77mm	55.65
208-0054-30	5.4mm	25mm	75mm	4.77mm	55.65
208-0055-30	5.5mm	25mm	75mm	4.77mm	55.65

CATALOGUE No.	SIZE	FLUTE LENGTH	OVERALL LENGTH	SHANK DIAMETER	PRICE £
208-0056-30	5.6mm	25mm	75mm	4.77mm	55.65
208-0057-30	5.7mm	25mm	75mm	5.58mm	77.13
208-0058-30	5.8mm	25mm	75mm	5.58mm	77.13
208-0059-30	5.9mm	25mm	75mm	5.58mm	77.13
208-0060-30	6.0mm	25mm	75mm	5.58mm	77.13
208-0061-30	6.1mm	25mm	75mm	5.58mm	77.13
208-0062-30	6.2mm	25mm	75mm	5.58mm	77.13
208-0063-30	6.3mm	25mm	75mm	5.58mm	77.13
208-0064-30	6.4mm	25mm	75mm	5.58mm	77.13
208-0065-30	6.5mm	29mm	83mm	6.35mm	94.28
208-0066-30	6.6mm	29mm	83mm	6.35mm	94.28
208-0067-30	6.7mm	29mm	83mm	6.35mm	94.28
208-0068-30	6.8mm	29mm	83mm	6.35mm	94.28
208-0069-30	6.9mm	29mm	83mm	6.35mm	94.28
208-0070-30	7.0mm	29mm	83mm	6.35mm	94.28
208-0071-30	7.1mm	29mm	83mm	6.35mm	94.28
208-0072-30	7.2mm	29mm	83mm	6.35mm	94.28
208-0073-30	7.3mm	29mm	83mm	7.15mm	103.32
208-0074-30	7.4mm	29mm	83mm	7.15mm	103.32
208-0075-30	7.5mm	29mm	83mm	7.15mm	103.32
208-0076-30	7.6mm	29mm	83mm	7.15mm	103.32
208-0077-30	7.7mm	29mm	83mm	7.15mm	103.32
208-0078-30	7.8mm	29mm	83mm	7.15mm	103.32
208-0079-30	7.9mm	29mm	83mm	7.15mm	103.32
208-0080-30	8.0mm	29mm	83mm	7.15mm	103.32
208-0081-30	8.1mm	32mm	89mm	7.94mm	114.86
208-0082-30	8.2mm	32mm	89mm	7.94mm	114.86
208-0083-30	8.3mm	32mm	89mm	7.94mm	114.86
208-0084-30	8.4mm	32mm	89mm	7.94mm	114.86
208-0085-30	8.5mm	32mm	89mm	7.94mm	114.86
208-0090-30	9.0mm	32mm	89mm	8.75mm	114.86
208-0095-30	9.5mm	32mm	89mm	8.75mm	125.42

N.B. Other sizes available on request.

For Speeds & Feeds please see pages 155.

204 Long Series

Carbide Reamer



Imperial Sizes (inches)

CATALOGUE No.	SIZE (")	METRIC EQUIVALENT	FLUTE LENGTH (")	OVERALL LENGTH (")	SHANK DIAMETER (")	PRICE £
204-1300-30	1/8	3.18mm	7/8	3-1/2	.1094	44.31
204-1600-30	5/32	3.97mm	1	4	.1406	49.35
204-1950-30	3/16	4.77mm	1-1/8	4-1/2	.1719	59.56
204-2250-30	7/32	5.56mm	1-1/4	5	.1875	64.03
204-2550-30	1/4	6.35mm	1-1/2	6	.2188	67.93
204-2850-30	9/32	7.15mm	1-1/2	6	.2500	74.27
204-3200-30	5/16	7.94mm	1-5/8	6	.2812	80.97
204-3500-30	11/32	8.73mm	1-5/8	6	.3125	85.63
204-3850-30	3/8	9.53mm	1-3/4	7	.3438	100.53
204-4450-30	13/32	10.32mm	1-3/4	7	.3750	131.22
204-4450-30-A	7/16	11.11mm	1-3/4	7	.3750	131.22
204-5100-30	1/2	12.70mm	1-3/4	8	.4693	134.01

Metric Sizes (mm)

CATALOGUE No.	SIZE (mm)	IMPERIAL EQUIVALENT	FLUTE LENGTH (mm)	OVERALL LENGTH (mm)	SHANK DIAMETER (mm)	PRICE £
204-0030-30	3	0.1181"	22	89	2.78	44.31
204-0035-30	3.5	0.1378"	22	89	3.18	44.70
204-0040-30	4	0.1575"	25	101	3.57	49.35
204-0045-30	4.5	0.1772"	29	114	4.37	59.56
204-0050-30	5	0.1969"	32	127	4.76	64.03
204-0055-30	5.5	0.2165"	32	127	4.76	64.03
204-0060-30	6	0.2362"	38	152	5.55	67.97
204-0065-30	6.5	0.2559"	38	152	6.35	67.97
204-0070-30	7	0.2756"	38	152	6.35	67.97
204-0075-30	7.5	0.2953"	41	152	7.14	80.97
204-0080-30	8	0.3150"	41	152	7.14	80.97
204-0085-30	8.5	0.3346"	41	152	7.94	85.63
204-0090-30	9	0.3543"	44	178	9.52	100.53
204-0095-30	9.5	0.3740"	44	178	8.73	100.53
204-0100-30	10	0.3937"	44	178	9.52	131.22
204-0105-30	10.5	0.4134"	44	178	9.52	131.22
204-0110-30	11	0.4331"	44	178	9.52	131.22
204-0115-30	11.5	0.4528"	44	203	11.11	131.22
204-0120-30	12	0.4724"	44	203	11.11	134.01
204-0125-30	12.5	0.4921"	44	203	11.11	134.01

+0.0003" - .0000" (+0.008mm - 0.000mm) tolerance

-10	=	Straight Flute
-30	=	Right Hand Spiral

Made To Order Reamers

208 Series

Carbide Reamer



Description

Solid carbide, right hand spiral or straight flute, right hand cut. Sizes up to 4.85mm have 4 flutes. Larger reamers have 6 flutes.

Application

Designed to give extremely tight hole tolerances in a variety of materials. Price On Application

204 Series

Long Series Carbide Reamer



Description

Solid carbide (up to 4.85mm), or brazed steel shank (up to 12.75mm). Right hand spiral or straight flute, right hand cut. Sizes up to 4.85mm have 4 flutes, larger reamers have 6 flutes.

Application

Designed to give extremely tight hole tolerances in a variety of materials. Price On Application

Made to Order

SIZE RANGE ["]	FLUTE LENGTH ["]	OVERALL LENGTH ["]	SHANK DIAMETER ["]	STRAIGHT FLUTE	RHS FLUTE
.0971-.1120	5/8	2-1/4	.0938	208-1145-10F	208-1145-30F
.1121-.1280	5/8	2-1/4	.1094	208-1290-10F	208-1290-30F
.1281-.1435	3/4	2-1/2	.1250	208-1455-10F	208-1455-30F
.1436-.1590	3/4	2-1/2	.1406	208-1590-10F	208-1590-30F
.1591-.1750	7/8	2-3/4	.1562	208-1750-10F	208-1750-30F
.1751-.1910	7/8	2-3/4	.1719	208-1900-10F	208-1900-30F
.1911-.2210	1	3	.1875	208-2240-10F	208-2240-30F
.2211-.2530	1	3	.2188	208-2540-10F	208-2540-30F
.2531-.2840	1-1/8	3-1/4	.2500	208-2850-10F	208-2850-30F
.2841-.3150	1-1/8	3-1/4	.2812	208-3150-10F	208-3150-30F
.3151-.3470	1-1/4	3-1/2	.3125	208-3630-10F	208-3630-30F
.3471-.3780	1-1/4	3-1/2	.3445	208-3860-10F	208-3860-30F

Reamers are furnished to **+.0003" - .0000"**
(**+0.008mm - 0.000mm**) tolerance unless otherwise specified.

To Order: Find the size range in the left hand column above that contains the diameter you require. Select the part number in the column to the right, based on the flute style you desire. Your order should specify both the part number and the exact size; i.e. 208-3860-10F (.3720).

Made to Order

SIZE RANGE ["]	FLUTE LENGTH ["]	OVERALL LENGTH ["]	SHANK DIAMETER ["]	STRAIGHT FLUTE	RHS FLUTE
.1121-.1280	7/8	3-1/2	.1094	204-1300-10F	204-1300-30F
.1281-.1435	7/8	3-1/2	.1250	204-1450-10F	204-1450-30F
.1436-.1590	1	4	.1406	204-1600-10F	204-1600-30F
.1591-.1750	1	4	.1562	204-1750-10F	204-1750-30F
.1751-.1910	1-1/8	4-1/2	.1719	204-1950-10F	204-1950-30F
.1911-.2210	1-1/4	5	.1875	204-2250-10F	204-2250-30F
.2211-.2530	1-1/2	6	.2188	204-2250-10F	204-2250-30F
.2531-.2840	1-1/2	6	.2500	204-2850-10F	204-2850-30F
.2841-.3150	1-5/8	6	.2812	204-3200-10F	204-3200-30F
.3151-.3470	1-5/8	6	.3125	204-3500-10F	204-3500-30F
.3471-.3780	1-3/4	7	.3438	204-3850-10F	204-3850-30F
.3781-.4090	1-3/4	7	.3750	204-4090-10F	204-4090-30F
.4091-.4410	1-3/4	7	.4067	204-4450-10F	204-4450-30F
.4411-.4720	1-3/4	8	.4380	204-4720-10F	204-4720-30F
.4721-.5030	1-3/4	8	.4693	204-5100-10F	204-5100-30F

* Solid Carbide

For Speeds & Feeds please see page 155.

NEW

050221 Series

Carbide Reamer - Metric



Description

Solid carbide, left hand spiral, right hand cut. Metric shank size

Application

Designed to give extremely tight hole tolerances in a variety of materials.

Metric Sizes (mm)

CATALOGUE No.	SIZE	SHANK	FLUTE LENGTH	REACH	OVERALL LENGTH	PRICE £
050221-000020	2	2	11	24	49	41.12
050221-000030	3	3	15	32	61	45.92
050221-000040	4	4	19	41	75	53.84
050221-000050	5	5	23	51	86	72.96
050221-000060	6	5.6	26	53	93	80.50
050221-000080	8	8	33	75	117	104.00
050221-000100	10	10	38	87	133	128.96

Other sizes available on request.

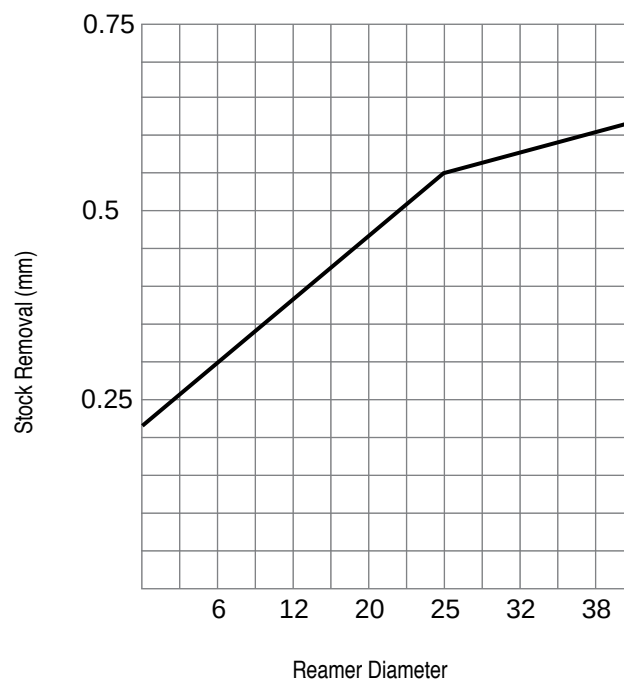
Speeds and feeds

Carbide Uncoated Reamers

MATERIAL GROUP	SURFACE SPEED METRES/MIN	HARDNESS (Bhn)	FEED (mm) REVOLUTION REAMER DIAMETER			
			3mm	6mm	12mm	20mm
Aluminium and Aluminum Alloys	50-80	-	0.100	0.152	0.254	0.355
Brass and Bronze	20-40	-	0.100	0.127	0.177	0.254
Copper and Copper Alloys	20-40	-	0.152	0.203	0.304	0.381
Cast Iron (Soft)	10-25	120-220	0.076	0.100	0.152	0.228
Cast Iron (Hard)	10-15	220-320	0.050	0.076	0.100	0.127
Ductile Iron	15-25	-	0.100	0.152	0.228	0.304
Malleable Iron	20-30	-	0.127	0.177	0.279	0.381
Magnesium and Magnesium Alloys	60-80	-	0.127	0.177	0.254	0.330
Hi-Temperature Alloys	6-12	-	0.050	0.076	0.100	0.152
Monel-High Nickel Steels	9-15	-	0.076	0.100	0.152	0.228
Plastics-Glass Filled	45-55	-	0.050	0.050	0.100	0.127
Plastics	39-45	-	0.050	0.050	0.076	0.127
Low Carbon Steels Annealed	20-26	-	0.152	0.245	0.355	0.508
Medium Carbon Steels	12-20	275-425	0.100	0.152	0.228	0.280
Hardened Steels	6-15	48-52 Rc "C"	0.050	0.076	0.100	0.127
Stainless Steel Soft	16-26	135-275	0.100	0.152	0.203	0.304
Stainless Steel Hard	12-20	275-425	0.076	0.100	0.127	0.127
Titanium (Soft)	15-30	-	0.100	0.152	0.254	0.279
Titanium (Hard)	9-20	-	0.050	0.127	0.203	0.254
Refractory Alloys	15-30	-	0.100	0.127	0.177	0.228

Stock Removal

Stock removal depends on work piece material and finish required. This graph shows starting points for various diameters.



220 Series

Boring Tools



Description

Solid carbide, single point boring tool.

Application

Designed to facilitate extremely accurate boring and to give a very fine finish in difficult to machine alloys.

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	MINIMUM HOLE DIAMETER	MAXIMUM DEPTH OF HOLE	SHANK DIAMETER	OVERALL LENGTH	PRICE £
220-0060-00	M40663	.060	3/16	1/8	1-1/2	27.44
220-0070-00	M40664	.070	1/4	1/8	1-1/2	27.44
220-0080-00	M40665	.080	3/8	1/8	1-1/2	27.44
220-0100-00	M40666	.090	1/2	1/8	1-1/2	22.07
220-0200-00	M40667	.120	5/8	1/8	1-1/2	22.66
220-0300-00	M40668	.150	3/4	3/16	2	30.58
220-0400-00	M40669	.180	1	3/16	2	31.45
220-0500-00	M40670	.210	1-1/4	1/4	2	39.08
220-0600-00	M40671	.240	1-1/4	1/4	2	39.43
220-0700-00	M40672	.270	1-1/4	5/16	2-1/4	52.91
220-0800-00	M40673	.300	1-1/4	5/16	2-1/4	54.45
220-0900-00	M40674	.330	1-1/2	3/8	2-1/2	64.63
220-1000-00	M40675	.360	1-1/2	3/8	2-1/2	67.04

Boring Tools



Description

Solid carbide single point boring tool system. Available uncoated or AlTiN Coated.

Application

Suitable for hole finishing in a wide variety of materials.

Metric Sizes (mm)

CATALOGUE NO. UNCOATED	CATALOGUE NO. COATED	MIN HOLE DIA	MAX DEPTH OF HOLE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED PRICE £	COATED PRICE £
BBM-040204	BBM-040204X	2	4	4	50	21.93	25.34
BBM-040208	BBM-040208X	2	8	4	50	21.93	25.34
BBM-040213	BBM-040213X	2	13	4	50	21.93	25.34
BBM-040308	BBM-040308X	3	8	4	50	21.93	25.34
BBM-040313	BBM-040313X	3	13	4	50	21.93	25.34
BBM-040320	BBM-040320X	3	20	4	50	21.93	25.34
BBM-040408	BBM-040408X	4	8	4	50	21.93	25.34
BBM-040415	BBM-040415X	4	15	4	50	21.93	25.34
BBM-040425	BBM-040425X	4	25	4	50	21.93	25.34
BBM-060510	BBM-060510X	5	10	6	57	24.53	27.94
BBM-060520	BBM-060520X	5	20	6	57	24.53	27.94
BBM-060528	BBM-060528X	5	28	6	57	24.53	27.94
BBM-060610	BBM-060610X	6	10	6	57	24.53	27.94
BBM-060620	BBM-060620X	6	20	6	57	24.53	27.94
BBM-060630	BBM-060630X	6	30	6	57	24.53	27.94
BBM-060638	BBM-060638X	6	38	6	57	24.53	27.94
BBM-080715	BBM-080715X	7	15	8	63	33.53	38.46
BBM-080725	BBM-080725X	7	25	8	63	33.53	38.46
BBM-080732	BBM-080732X	7	32	8	63	33.53	38.46
BBM-080746	BBM-080746X	7	46	8	63	33.53	38.46
BBM-080813	BBM-080813X	8	13	8	63	33.53	38.46
BBM-080825	BBM-080825X	8	25	8	63	33.53	38.46
BBM-080838	BBM-080838X	8	38	8	63	33.53	38.46
BBM-080850	BBM-080850X	8	50	8	63	33.53	38.46

Boring Tools

Minature



Description

Solid carbide single point boring tool system. Available uncoated or AlTiN Coated.

Application

Suitable for hole finishing in a wide variety of materials.

Metric Sizes (mm)

CATALOGUE NO. UNCOATED	CATALOGUE NO. COATED	MIN HOLE DIA	MAX DEPTH OF HOLE	SHANK DIAMETER	OVERALL LENGTH	UNCOATED PRICE £	COATED PRICE £
MBBM-003012	MBBM-003012X	0.3	1.25	3	38	27.75	31.16
MBBM-004015	MBBM-004015X	0.4	1.5	3	38	27.75	31.16
MBBM-005020	MBBM-005020X	0.5	2	3	38	27.75	31.16
MBBM-006025	MBBM-006025X	0.6	2.5	3	38	27.75	31.16
MBBM-007030	MBBM-007030X	0.7	3	3	38	27.75	31.16
MBBM-007040	MBBM-007040X	0.7	4	3	38	27.75	31.16
MBBM-008030	MBBM-008030X	0.8	3	3	38	27.75	31.16
MBBM-008040	MBBM-008040X	0.8	4	3	38	27.75	31.16
MBBM-009030	MBBM-009030X	0.9	3	3	38	27.75	31.16
MBBM-009040	MBBM-009040X	0.9	4	3	38	27.75	31.16
MBBM-009050	MBBM-009050X	0.9	5	3	38	27.75	31.16
MBBM-010030	MBBM-010030X	1	3	3	38	27.75	31.16
MBBM-010040	MBBM-010040X	1	4	3	38	27.75	31.16
MBBM-010050	MBBM-010050X	1	5	3	38	27.75	31.16

Boring Tool Holders



CATALOGUE NO.	BORE DIAMETER	SHANK DIAMETER	OVERALL LENGTH	PRICE
THM-312	3	12	75	29.37
THM-316	3	16	75	29.37
THM-320	3	20	75	34.10
THM-412	4	12	75	29.37
THM-416	4	16	75	29.37
THM-420	4	20	75	34.10
THM-612	6	12	75	29.37
THM-616	6	16	75	29.37
THM-620	6	20	75	34.10
THM-812	8	12	75	29.37
THM-816	8	16	75	29.37
THM-820	8	20	75	34.10
THM-1016	10	16	75	29.37
THM-1020	10	20	75	34.10
THM-1216	12	16	75	29.37
THM-1220	12	20	75	34.10

110 Series



Single Flute



Description

Solid carbide or brazed shank, single flute counter sink.

Application

Designed to accurately counter sink and chamfer holes whilst giving excellent surface finish on most materials except hardened steel. Sizes 3/8" and upwards have steel shanks.

Imperial Sizes (inches)

CATALOGUE No.	M NUMBER	CUTTER DIAMETER	INCLUDED ANGLE	SHANK DIAMETER	OVERALL LENGTH	PRICE £
110-0010-50*	M40605	1/8	60°	1/8	1-1/2	10.93
110-0010-60*	M40606	1/8	82°	1/8	1-1/2	10.93
110-0010-70*	M40607	1/8	90°	1/8	1-1/2	10.93
110-0020-50*	M40608	1/4	60°	1/4	2	18.00
110-0020-60*	M40609	1/4	82°	1/4	2	18.00
110-0020-70*	M40610	1/4	90°	1/4	2	18.00
110-0030-50	M40611	3/8	60°	1/4	2-9/16	35.35
110-0030-60	M40612	3/8	82°	1/4	2-7/16	35.35
110-0030-70	M40613	3/8	90°	1/4	2-7/16	35.35
110-0040-50	M40614	1/2	60°	1/4	2-5/8	48.88
110-0040-60	M40615	1/2	82°	1/4	2-1/2	48.88
110-0040-70	M40616	1/2	90°	1/4	2-1/2	48.88
110-0050-50	M40617	5/8	60°	1/4	2-3/4	68.26
110-0050-60	M40618	5/8	82°	1/4	2-5/8	68.26
110-0050-70	M40619	5/8	90°	1/4	2-5/8	68.26
110-0060-50	M40620	5/8	60°	3/8	3	68.26
110-0060-60	M40621	5/8	82°	3/8	2-7/8	68.26
110-0060-70	M40622	5/8	90°	3/8	2-7/8	68.26
110-0070-50	M40623	3/4	60°	3/8	3	89.88
110-0070-60	M40624	3/4	82°	3/8	2-7/8	89.88
110-0070-70	M40625	3/4	90°	3/8	2-7/8	89.88
110-0080-50	M40626	1	60°	1/2	3-1/4	149.44
110-0080-60	M40627	1	82°	1/2	3	149.44
110-0080-70	M40628	1	90°	1/2	3	149.44

* Solid Carbide

111 Series

Multi Flute

WIDIA 
METAL REMOVAL

Description

Solid carbide or brazed shank, multi flute counter sink.



Application

Designed to accurately counter sink and chamfer holes and components up to 60 Rockwell C. Sizes up to 1/4" or 6mm are solid carbide double ended. On hardened steel use a surface speed of approximately 10 to 20 m/min.

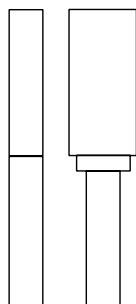
Metric & Imperial Shanks

CATALOGUE No.	M NUMBER	CUTTER DIAMETER	INCLUDED ANGLE	SHANK DIAMETER	OVERALL LENGTH	PRICE £
111-3000-50*	M40651	3mm	60°	3mm	1-1/2"	13.60
111-0000-50*	M40629	1/8"	60°	1/8"	1-1/2"	11.31
111-0000-70*	M40630	1/8"	90°	1/8"	1-1/2"	11.31
111-3000-70*		3mm	90°	3mm	1-1/2"	13.60
111-0005-50*	M40631	3/16"	60°	3/16"	2"	15.37
111-0005-70*	M40632	3/16"	90°	3/16"	2"	15.37
111-6010-50*	M40652	6mm	60°	6mm	2"	17.54
111-0010-50*	M40633	1/4"	60°	1/4"	2"	22.48
111-0010-60*	M40634	1/4"	82°	1/4"	2"	17.54
111-6010-70*	M40653	6mm	90°	6mm	2"	17.54
111-0010-70*	M40635	1/4"	90°	1/4"	2"	17.54
111-6020-50	M40654	3/8"	60°	6mm	2-3/16"	22.31
111-0020-50	M40636	3/8"	60°	1/4"	2-3/16"	22.31
111-0020-60	M40637	3/8"	82°	1/4"	2-1/16"	22.31
111-6020-70	M40655	3/8"	90°	6mm	2-1/16"	22.31
111-0020-70	M40638	3/8"	90°	1/4"	2-1/16"	22.31
111-6030-50	M40656	1/2"	60°	6mm	2-9/32"	28.05
111-0030-50	M40639	1/2"	60°	1/4"	2-9/32"	22.31
111-0030-60	M40640	1/2"	82°	1/4"	2-1/8"	22.31
111-6030-70	M40657	1/2"	90°	6mm	2-1/8"	22.31
111-0030-70	M40641	1/2"	90°	1/4"	2-1/8"	22.31
111-6040-50	M40658	5/8"	60°	6mm	2-7/16"	39.94
111-0040-50	M40642	5/8"	60°	1/4"	2-7/16"	39.94
111-0040-60	M40643	5/8"	82°	1/4"	2-7/32"	39.94
111-6040-70	M40659	5/8"	90°	6mm	2-7/32"	39.94
111-0040-70	M40644	5/8"	90°	1/4"	2-7/32"	39.94
111-6050-50	M40660	3/4"	60°	6mm	2-17/32"	54.99
111-0050-50	M40645	3/4"	60°	1/4"	2-17/32"	54.99
111-0050-60	M40646	3/4"	82°	1/4"	2-9/32"	54.99
111-0050-70	M40647	3/4"	90°	1/4"	2-9/32"	54.99
111-6050-70	M40661	3/4"	90°	6mm	2-9/32"	54.99
111-0060-50	M40648	1"	60°	1/4"	2-23/32"	68.43
111-0060-60	M40649	1"	82°	1/4"	2-3/8"	68.43
111-6060-70	M40662	1"	90°	6mm	2-3/8"	68.43
111-0060-70	M40650	1"	90°	1/4"	2-3/8"	68.43

* Solid Carbide-double ended

 Metric

Cylinder Without End Cut



Imperial Shank Sizes (inches)

Metric Shank Sizes (mm)

CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	PRICE £
1/16	1/4	1-1/2	1/8	010-0137-20*	M41200	010-0133-20*	3mm	010-3137-20*	M40222	010-3133-20*	9.80
3/32	7/16	1-1/2	1/8	010-0017-20*	M41201	010-0013-20*	3mm	010-3017-20*	M40223	010-3013-20*	9.80
3mm	14mm	38mm	-	-		-	3mm	010-3027-20*	M40224	010-3023-20*	9.80
1/8	9/16	1-1/2	1/8	010-0027-20*	M41202	010-0023-20*	-	-		-	9.80
5/32	1/2	1-1/2	1/8	020-0017-20*	M41206	020-0013-20*	3mm	020-3017-20	M40230	020-3013-20	23.66
3/16	1/2	1-1/2	1/8	020-0027-20*	M41207	020-0023-20*	3mm	020-3027-20		020-3023-20	30.65
1/4	3/16	1-7/16	1/8	015-0067-20		015-0063-20	3mm	015-3067-20		015-3013-20	17.05
1/4	1/2	1-3/4	1/8	015-0017-20	M41210	015-0013-20	3mm	015-3017-20		015-3063-20	17.05
1/8	1/2	2	1/4	041-1007-20*	M41205	041-1003-20*	6mm	041-6007-20*		041-6003-20*	21.36
3/16	5/8	2	1/4	041-1017-20*	M41208	041-1013-20*	6mm	041-6017-20*		041-6013-20*	21.36
6mm	16mm	51mm	-	-		-	6mm	041-6027-20*	M40229	041-6023-20*	21.36
1/4	5/8	2	1/4	041-1027-20*	M41211	041-1023-20*	-	-		-	21.36
5/16	3/4	2-1/2	1/4	041-1047-20	M41213	041-1043-20	6mm	041-6047-20		041-6043-20	21.63
3/8	3/4	2-1/2	1/4	041-1067-20	M41214	041-1063-20	6mm	041-6067-20	M40233	041-6063-20	23.71
3/8	3/4	2-1/2	-	-		-	8mm	041-8067-20		041-8063-20	36.24
7/16	1	2-3/4	1/4	041-1077-20		041-1073-20	6mm	041-6077-20		041-6073-20	44.41
7/16	1	2-3/4	-	-		-	8mm	041-8077-20		041-8073-20	44.41
1/2	1	2-3/4	1/4	041-1087-20	M41217	041-1083-20	6mm	041-6087-20	M40237	041-6083-20	35.79
1/2	1	2-3/4	-	-		-	8mm	041-8087-20		041-8083-20	36.24
5/8	1	2-3/4	1/4	041-1097-20	M41219	041-1093-20	6mm	041-6097-20		041-6093-20	45.23
5/8	1	2-3/4	-	-		-	8mm	041-8097-20		041-8093-20	46.57
3/4	1	2-3/4	-	-		-	6mm	041-6107-20		041-6103-20	67.07
3/4	1	2-3/4	-	-		-	8mm	041-8107-20		041-8103-20	69.07
3/4	1	2-3/4	1/4	041-1117-20	M41220	041-1113-20	6mm	041-6117-20		041-6113-20	67.04
3/4	1	2-3/4	-	-		-	8mm	041-8117-20		041-8113-20	69.07
1	1	2-3/4	1/4	041-1127-20	M41221	041-1123-20	6mm	041-6127-20		041-6123-20	93.69
1	1	2-3/4	-	-		-	8mm	041-8127-20		041-8123-20	97.59

* Solid Carbide; all others have hardened steel shanks

Metric

Cylinder With End Cut



Imperial Shank Sizes (inches)

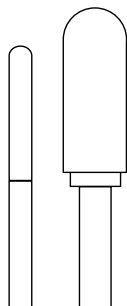
Metric Shank Sizes (mm)

CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	PRICE £
1/16	1/4	1-1/2	1/8	-		010-0133-21*	3mm	010-3137-21*	M40261	010-3133-21*	11.62
3/32	7/16	1-1/2	-	-		-	3mm	010-3017-21*	M40262	010-3013-21*	11.62
3mm	14mm	38mm	-	-		-	3mm	010-3027-21*	M40263	010-3023-21*	9.80
1/8	9/16	1-1/2	1/8	-		010-0023-21*	-	-		-	9.80
5/32	1/2	1-1/2	-	-		-	3mm	020-3017-21	M40265	020-3013-21	23.66
3/16	1/2	1-1/2	-	-		-	3mm	020-3027-21		020-3023-21	22.90
1/4	3/16	1-7/16	1/8	015-0067-21		015-0063-21	3mm	015-3067-21	M40269	015-3013-21	17.49
1/4	1/2	1-3/4	1/8	015-0017-21		015-0013-21	3mm	015-3017-21	M40270	015-3063-21	17.49
1/8	1/2	2	1/4	041-1007-21*	M41250	041-1003-21*	6mm	041-6007-21*		041-6003-21*	19.79
3/16	5/8	2	1/4	041-1017-21*	M41251	041-1013-21*	6mm	041-6017-21*		041-6013-21*	19.79
6mm	16mm	51mm	-	-		-	6mm	041-6027-21*	M40268	041-6023-21*	19.79
1/4	5/8	2	1/4	041-1027-21*	M41254	041-1023-21*	-	-		-	19.79
5/16	3/4	2-1/2	1/4	041-1047-21	M41255	041-1043-21	6mm	041-6047-21	M40271	041-6043-21	31.35
3/8	3/4	2-1/2	1/4	041-1067-21	M41256	041-1063-21	6mm	041-6067-21	M40272	041-6063-21	31.35
7/16	1	2-3/4	1/4	041-1077-21	M41257	041-1073-21	6mm	041-6077-21		041-6073-21	36.59
1/2	1	2-3/4	1/4	041-1087-21	M41258	041-1083-21	6mm	041-6087-21	M40274	041-6083-21	40.05
1/2	1	2-3/4	-	-		-	8mm	041-8087-21		041-8083-21	40.05
5/8	1	2-3/4	1/4	041-1097-21		-	6mm	041-6097-21		041-6093-21	49.99
5/8	1	2-3/4	-	-		-	8mm	041-8097-21		041-8093-21	49.99
3/4	1	2-3/4	-	-		-	6mm	041-6107-21		041-6103-21	93.53
3/4	1	2-3/4	-	-		-	8mm	041-8107-21		041-8103-21	93.53
3/4	1	2-3/4	1/4	041-1117-21	M41260	-	6mm	041-6117-21	M40278	041-6113-21	93.53
3/4	1	2-3/4	-	-		-	8mm	041-8117-21		041-8113-21	93.53
1	1	2-3/4	-	-		-	6mm	041-6127-21		041-6123-21	130.00
1	1	2-3/4	-	-		-	8mm	041-8127-21		041-8123-21	130.00

* Solid Carbide; all others have hardened steel shanks

Metric

Ball Nose Cylinder



Imperial Shank Sizes (inches)

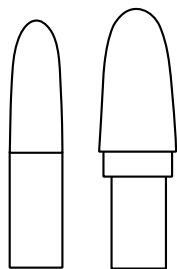
Metric Shank Sizes (mm)

CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	PRICE £
3/32	7/16	1-1/2	1/8	010-0077-20*	M41284	010-0073-20*	3mm	010-3077-20*	M40303	010-3073-20*	9.82
3mm	14mm	38mm	-	-		-	3mm	010-3037-20*	M40304	010-3033-20*	9.82
1/8	9/16	1-1/2	1/8	010-0037-20*	M41285	010-0033-20*	-	-		-	9.82
5/32	1/2	1-1/2	1/8	020-0037-20*		020-0033-20*	3mm	020-3037-20		020-3033-20	23.24
3/16	1/2	1-1/2	1/8	020-0047-20*	M41290	020-0043-20*	3mm	020-3047-20		020-3043-20	23.24
1/4	1/2	1-3/4	1/8	015-0027-20		015-0023-20	3mm	015-3027-20	M40310	015-3023-20	19.28
1/8	1/2	2	1/4	042-1007-20*		042-1003-20*	6mm	042-6007-20*		042-6003-20*	19.33
3/16	5/8	2	1/4	042-1017-20*		042-1013-20*	6mm	042-6017-20*		042-6013-20*	19.33
6mm	16mm	51mm	-	-		-	6mm	042-6027-20*	M40309	042-6023-20*	19.33
1/4	5/8	2	1/4	042-1027-20*	M41293	042-1023-20*	-	-		-	19.33
5/16	3/4	2-1/2	1/4	042-1047-20	M41295	042-1043-20	6mm	042-6047-20		042-6043-20	23.97
3/8	3/4	2-1/2	1/4	042-1057-20	M41296	042-1053-20	6mm	042-6057-20	M40312	042-6053-20	26.11
3/8	3/4	2-1/2	-	-		-	8mm	042-8057-20		042-8053-20	26.11
7/16	1	2-3/4	1/4	042-1167-20		042-1163-20	6mm	042-6167-20		042-6163-20	36.53
7/16	1	2-3/4	-	-		-	8mm	042-8167-20		042-8163-20	36.53
1/2	1	2-3/4	1/4	042-1067-20	M41299	042-1063-20	6mm	042-6067-20	M40316	042-6063-20	40.10
1/2	1	2-3/4	-	-		-	8mm	042-8067-20		042-8063-20	40.10
5/8	1	2-3/4	1/4	042-1077-20	M41301	042-1073-20	6mm	042-6077-20		042-6073-20	52.54
5/8	1	2-3/4	-	-		-	8mm	042-8077-20		042-8073-20	52.54
3/4	1	2-3/4	1/4	042-1087-20		042-1083-20	6mm	042-6087-20		042-6083-20	73.18
3/4	1	2-3/4	-	-		-	8mm	042-8087-20		042-8083-20	73.18

* Solid Carbide; all others have hardened steel shanks

Metric

Round Nose Tree



Imperial Shank Sizes (inches)

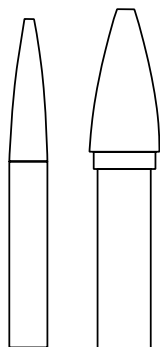
Metric Shank Sizes (mm)

CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	PRICE £
3mm	6mm	38mm	-	-		-	3mm	010-3277-20*	M40395	010-3273-20*	9.82
3mm	12mm	38mm	-	-		-	3mm	010-3057-20*	M40396	010-3053-20*	9.82
1/8	1/4	1-1/2	1/8	-		010-0273-20*	-	-		-	9.82
1/8	1/2	1-1/2	1/8	-		010-0053-20*	-	-		-	9.82
3/16	1/2	1-1/2	1/8	020-0077-20*	M41381	020-0073-20*	3mm	020-3077-20	M40397	020-3073-20	23.24
1/4	1/2	1-3/4	1/4	015-0037-20		015-0033-20	3mm	015-3037-20	M40399	015-3033-20	18.07
6mm	16mm	51mm	-	-		-	6mm	043-6017-20*	M40398	043-6013-20*	21.05
1/4	5/8	2	1/4	043-1017-20*	M41383	043-1013-20*	-	-		-	21.05
3/8	3/4	2-1/2	1/4	043-1037-20	M41385	043-1033-20	6mm	043-6037-20	M40400	043-6033-20	25.01
7/16	1	2-3/4	1/4	043-1057-20		043-1053-20	6mm	043-6057-20	M40401	043-6053-20	36.55
1/2	3/4	2-1/2	1/4	043-1047-20	M41388	043-1043-20	6mm	043-6047-20		043-6043-20	36.55
1/2	3/4	2-1/2	-	-		-	8mm	043-8047-20		043-8043-20	38.97
1/2	1	2-3/4	1/4	043-1067-20	M41389	043-1063-20	6mm	043-6067-20	M40403	043-6063-20	37.15
1/2	1	2-3/4	-	-		-	8mm	043-8067-20		043-8063-20	37.15
5/8	1	2-3/4	1/4	043-1077-20	M41391	043-1073-20	6mm	043-6077-20		043-6073-20	50.87
5/8	1	2-3/4	-	-		-	8mm	043-8077-20		043-8073-20	50.87
3/4	1	2-3/4	1/4	043-1087-20		043-1083-20	6mm	043-6087-20		043-6083-20	68.32
3/4	1	2-3/4	-	-		-	8mm	043-8087-20		043-8083-20	68.32
3/4	1-1/4	3	1/4	043-1097-20		043-1093-20	6mm	043-6097-20		043-6093-20	85.67
3/4	1-1/4	3	-	-		-	8mm	043-8097-20		043-8093-20	85.67
1	1-1/2	3	1/4	043-1107-20		043-1103-20	6mm	043-6107-20		043-6103-20	101.85
1	1-1/2	3	-	-		-	8mm	043-8107-20		043-8103-20	101.85

* Solid Carbide; all others have hardened steel shanks

Metric

Pointed Tree



Imperial Shank Sizes (inches)

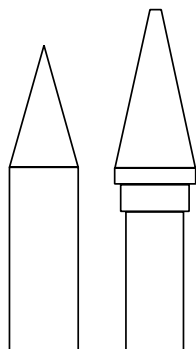
Metric Shank Sizes (mm)

CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	PRICE £
3mm	6mm	38mm	-	-		-	3mm	010-3047-20*	M40428	010-3043-20*	9.82
1/8	1/4	1-1/2	1/8	010-0047-20*	M41414	010-0043-20*	-	-		-	9.82
3mm	8mm	38mm	-	-		-	3mm	010-3177-20*	M40429	010-3173-20*	9.82
1/8	5/16	1-1/2	1/8	010-0177-20*	M41415	010-0173-20*	-	-		-	9.82
3mm	10mm	38mm	-	-		-	3mm	010-3187-20*	M40430	010-3183-20*	9.82
1/8	3/8	1-1/2	1/8	010-0187-20*	M41416	010-0183-20*	-	-		-	9.82
3mm	13mm	38mm	-	-		-	3mm	010-3247-20*	M40431	010-3243-20*	9.82
1/8	1/2	1-1/2	1/8	010-0247-20*		010-0243-20*	-	-		-	9.82
3/16	1/2	1-1/2	1/8	020-0087-20*	M41418	020-0083-20*	3mm	020-3087-20		020-3083-20	23.24
1/4	1/2	1-3/4	1/8	015-0047-20*	M41419	015-0043-20*	6mm	015-3047-20	M40434	015-3043-20	15.63
6mm	16mm	51mm	-	-		-	6mm	044-6017-20*	M40433	044-6013-20*	21.05
1/4	5/8	2	1/4	044-1017-20*	M41420	044-1013-20*	-	-		-	21.05
5/16	3/4	2-1/2	1/4	044-1027-20	M41421	044-1023-20	6mm	044-6027-20		044-6023-20	24.68
3/8	3/4	2-1/2	1/4	044-1037-20	M41422	044-1033-20	6mm	044-6037-20	M40435	044-6033-20	26.54
3/8	3/4	2-1/2	-	-		-	8mm	044-8037-20	M40436	044-8033-20	26.54
1/2	3/4	2-1/2	1/4	044-1047-20		044-1043-20	6mm	044-6047-20		044-6043-20	37.15
1/2	3/4	2-1/2	-	-		-	8mm	044-8047-20		044-8043-20	37.15
1/2	1	2-3/4	1/4	044-1057-20	M41424	044-1053-20	6mm	044-6057-20		044-6053-20	37.15
1/2	1	2-3/4	-	-		-	8mm	044-8057-20	M40439	044-8053-20	37.15
5/8	1	2-3/4	1/4	044-1067-20		044-1063-20	6mm	044-6067-20		044-6063-20	53.48
5/8	1	2-3/4	-	-		-	8mm	044-8067-20		044-8063-20	53.48
3/4	1	1-3/4	1/4	044-1077-20		044-1073-20	6mm	044-6077-20		044-6073-20	65.26
3/4	1	1-3/4	-	-		-	8mm	044-8077-20		044-8073-20	65.26

* Solid Carbide; all others have hardened steel shanks

Metric

Pointed Cone



Imperial Shank Sizes (inches)

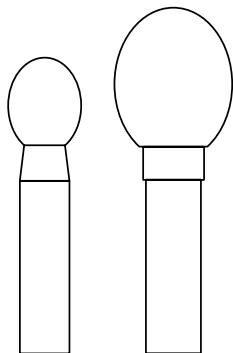
Metric Shank Sizes (mm)

CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	INCL ANGLE	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	PRICE £
3mm	10mm	38mm	12°	-	-		-	3mm	010-3067-20*	M40496	010-3063-20*	9.82
1/8	3/8	1-1/2	12°	1/8	010-0067-20*	M41485	010-0063-20*	-	-		-	9.82
3mm	8mm	38mm	14°	-	-		-	3mm	010-3197-20*	M40497	010-3193-20*	9.82
1/8	7/16	1-1/2	14°	1/8	010-0197-20*	M41486	010-0193-20*	-	-		-	9.82
3mm	16mm	38mm	7°	-	-		-	3mm	010-3117-20*	M40498	010-3113-20*	9.82
1/8	5/8	1-1/2	7°	1/8	010-0117-20*	M41487	010-0113-20*	-	-		-	9.82
3/16	1/2	1-1/2	7°	1/8	020-0097-20*	M41488	020-0093-20*	3mm	020-3097-20		020-3093-20	23.24
1/4	1/2	1-7/8	22°	1/8	015-0057-20	M41489	015-0053-20	3mm	015-3057-20	M40503	015-3053-20	15.87
6mm	13mm	51mm	22°	-	-		-	6mm	045-6017-20*	M40500	045-6013-20*	19.48
1/4	1/2	2	22°	1/4	045-1017-20	M41490	045-1013-20	-	-		-	19.48
6mm	20mm	51mm	14°	-	-		-	6mm	045-6027-20*	M40501	045-6023-20*	21.05
1/4	3/4	2	14°	1/4	045-1027-20	M41491	045-1023-20	-	-		-	21.05
6mm	25mm	51mm	10°	-	-		-	6mm	045-6037-20	M40502	045-6033-20	22.94
1/4	1	2	10°	1/4	045-1037-20*	M41492	045-1033-20*	-	-		-	22.94
3/8	5/8	2-1/2	28°	1/4	045-1047-20	M41493	045-1043-20	6mm	045-6047-20	M40504	045-6043-20	31.86
1/2	7/8	2-3/4	28°	1/4	045-1057-20	M41494	045-1053-20	6mm	045-6057-20	M40505	045-6053-20	39.32
1/2	7/8	2-3/4	28°	-	-		-	8mm	045-8057-20		045-8053-20	39.32
5/8	1	2-7/8	31°	1/4	045-1067-20		045-1063-20	6mm	045-6067-20	M40507	045-6063-20	53.80
5/8	1	1-7/8	31°	-	-		-	8mm	045-8067-20		045-8063-20	53.80

* Solid Carbide; all others have hardened steel shanks

☐ Metric

Egg Shape



Imperial Shank Sizes (inches)

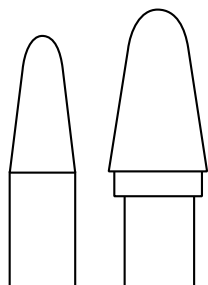
Metric Shank Sizes (mm)

CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	PRICE £
3mm	6mm	38mm	-	-		-	3mm	010-3097-20*	M40368	010-3093-20*	9.82
1/8	7/32	1-1/2	1/8	010-0097-20*	M41360	010-0093-20*	-	-		-	9.82
3/16	9/32	1-1/2	1/8	020-0067-20*	M41361	020-0063-20*	3mm	020-3067-20	M40369	020-3063-20	23.24
1/4	3/8	1-5/8	1/8	015-0087-20*	M41362	015-0083-20*	6mm	015-3087-20	M40370	015-3083-20	15.56
6mm	10mm	51mm	-	-		-	6mm	046-6017-20*	M40372	046-6013-20*	21.36
1/4	3/8	2	1/4	046-1017-20*	M41363	046-1013-20*	-	-		-	21.36
3/8	5/8	2-3/8	1/4	046-1027-20	M41364	046-1023-20	6mm	046-6027-20	M40371	046-6023-20	26.07
1/2	7/8	2-5/8	1/4	046-1037-20	M41365	046-1033-20	6mm	046-6037-20	M40373	046-6033-20	37.84
1/2	1	2-3/4	-	-		-	8mm	046-8037-20		046-8033-20	37.84
5/8	1	2-3/4	1/4	046-1047-20	M41366	046-1043-20	6mm	046-6047-20	M40375	046-6043-20	52.57
5/8	5/8	2-3/4	-	-		-	8mm	046-8047-20		046-8043-20	52.57
3/4	1	2-3/4	1/4	046-1057-20		046-1053-20	6mm	046-6057-20		046-6053-20	71.12
3/4	1	2-3/4	-	-		-	8mm	046-8057-20		046-8053-20	71.12

* Solid Carbide; all others have hardened steel shanks

Metric

Round Nose Cone



Imperial Shank Sizes (inches)

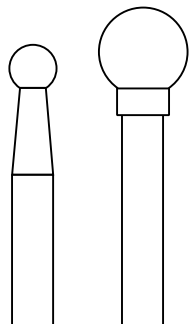
Metric Shank Sizes (mm)

CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	PRICE £
3mm	10mm	38mm	-	-		-	3mm	010-3237-20*	M40473	010-3233-20*	9.82
1/8	3/8	1-1/2	1/8	010-0237-20*	M41461	010-0233-20*	-	-		-	9.82
3mm	13mm	38mm	-	-		-	3mm	010-3267-20*	M40474	010-3263-20*	9.82
1/8	1/2	1-1/2	1/8	010-0267-20*		010-0263-20*	-	-		-	9.82
3/16	1/2	1-1/2	1/8	020-0127-20*	M41463	020-0123-20*	3mm	020-3127-20	M40475	020-3123-20	23.24
6mm	16mm	51mm	-	-		-	6mm	047-6017-20*	M40476	047-6013-20*	21.05
1/4	5/8	2	1/4	047-1017-20*	M41464	047-1013-20*	-	-		-	21.05
5/16	7/8	2-3/4	1/4	047-1027-20	M41466	047-1023-20	6mm	047-6027-20	M40478	047-6023-20	26.53
3/8	1-1/16	2-15/16	1/4	047-1037-20	M41467	047-1033-20	6mm	047-6037-20	M40479	047-6033-20	31.87
1/2	1-1/4	3	1/4	047-1047-20	M41469	047-1043-20	6mm	047-6047-20		047-6043-20	39.94
1/2	1-1/4	3	-	-		-	8mm	047-8047-20		047-8043-20	39.94
5/8	1-5/16	3-3/16	1/4	047-1057-20		047-1053-20	6mm	047-6057-20		047-6053-20	77.21
5/8	5/8	3-3/16	-	-		-	8mm	047-8057-20		047-8053-20	77.21
3/4	1-1/2	3-3/8	1/4	047-1067-20	M41472	047-1063-20	6mm	047-6067-20		047-6063-20	101.97
3/4	1-1/2	3-3/8	-	-		-	8mm	047-8067-20		047-8063-20	101.97

* Solid Carbide; all others have hardened steel shanks

 Metric

Ball Shape



Imperial Shank Sizes (inches)

Metric Shank Sizes (mm)

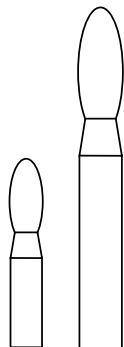
CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	PRICE £
1/16	-	1-1/12	1/8	-		010-0253-20*	-	-	M40342	010-3253-20*	9.82
3/32	-	1-1/2	1/8	010-0157-20*	M41323	010-0153-20*	3mm	010-3157-20*	M40343	010-3153-20*	9.82
3mm	-	38mm	-	-		-	-	010-3087-20*	M40344	010-3083-20*	9.82
1/8	-	1-1/2	1/8	010-0087-20*	M41324	010-0083-20*	-	-		-	9.82
3/16	-	1-1/2	1/8	020-0057-20*	M41328	020-0053-20*	3mm	020-3057-20		020-3053-20	23.24
1/4	-	1-3/4	1/8	015-0077-20	M41330	015-0073-20	3mm	015-3077-20	M40348	015-3073-20	15.86
1/8	-	2	1/4	048-1017-20*	M41327	048-1013-20*	-	-		-	18.22
3/16	-	2	1/4	048-1027-20*	M41329	048-1023-20*	6mm	048-6027-20		048-6023-20	18.22
6mm	-	51mm	-	-		-	6mm	048-6037-20*	M40347	048-6033-20*	18.22
1/4	-	2	1/4	048-1037-20*	M41331	048-1033-20*	-	-		-	18.22
5/16	-	2-1/32	1/4	048-1047-20	M41333	048-1043-20	6mm	048-6047-20	M40349	048-6043-20	19.48
3/8	-	2-5/64	1/4	048-1057-20	M41334	048-1053-20	6mm	048-6057-20	M40350	048-6053-20	21.07
7/16	-	2-9/64	1/4	048-1167-20	M41336	048-1163-20	6mm	048-6167-20	M40351	048-6163-20	28.30
1/2	-	2-13/64	1/4	048-1067-20	M41337	048-1063-20	6mm	048-6067-20	M40352	048-6063-20	28.30
1/2	-	2-13/64	-	-		-	8mm	048-8067-20		048-8063-20	28.30
5/8	-	2-5/16	1/4	048-1077-20	M41339	048-1073-20	6mm	048-6077-20	M40354	048-6073-20	35.79
5/8	-	2-5/16	-	-		-	8mm	048-8077-20		048-8073-20	35.79
3/4	-	2-7/16	1/4	048-1087-20		048-1083-20	6mm	048-6087-20		048-6083-20	48.57
3/4	-	2-7/16	-	-		-	8mm	048-8087-20		048-8083-20	48.57
1	-	2-11/16	1/4	048-1097-20	M41341	048-1093-20	6mm	048-6097-20		048-6093-20	82.93
1	-	2-11/16	-	-		-	8mm	048-8097-20		048-8093-20	82.93

* Solid Carbide; all others have hardened steel shanks

Metric

Flame Shape

WIDIA 
METAL REMOVAL



Imperial Shank Sizes (inches)

Metric Shank Sizes (mm)

CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H.SPIRAL / CATALOGUE No.	PRICE £
3mm	6mm	38mm	-	-		-	3mm	010-3107-20*	M40452	010-3103-20*	9.82
1/8	1/4	1-1/2	1/8	010-0107-20*	M41446	010-0103-20*	-	-		-	9.82
3/16	3/8	1-1/2	1/8	020-0107-20*	M41447	020-0103-20*	3mm	020-3107-20	M40453	020-3103-20	22.93
5/16	3/4	2-1/2	1/4	051-1017-20	M41448	051-1013-20	6mm	051-6017-20	M40454	051-6013-20	26.16
1/2	1-1/4	3	1/4	051-1027-20	M41449	051-1023-20	6mm	051-6027-20	M40455	051-6023-20	56.09
1/2	1-1/4	3	-	-		-	8mm	051-8027-20		051-8023-20	56.09
5/8	1-7/16	3-3/16	1/4	051-1037-20	M41450	051-1033-20	6mm	051-6037-20		051-6033-20	81.63
5/8	1-7/16	3-3/16	-	-		-	8mm	051-8037-20		051-8033-20	81.63
3/4	1-5/8	3-3/8	1/4	051-1047-20		051-1043-20	6mm	051-6047-20		051-6043-20	93.69
3/4	1-5/8	3-3/8	-	-		-	8mm	052-8047-20		051-8043-20	93.69

* Solid Carbide; all others have hardened steel shanks

 Metric

Inverted Taper



Imperial Shank Sizes (inches)

Metric Shank Sizes (mm)

CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	INCL ANGLE	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H. SPIRAL / CATALOGUE No.	SHANK SIZE	MASTER CUT CATALOGUE No.	M NUMBER	R.H. SPIRAL / CATALOGUE No.	PRICE £
3/32	3/16	1-1/2	10°	1/8	-		010-0223-20*	-	-		-	9.98
3mm	5mm	38mm	10°	-	-		-	3mm	010-3127-20*	M40516	010-3123-20*	9.98
1/8	3/16	1-1/2	10°	1/8	010-0127-20*	M41510	010-0123-20*	-	-		-	9.98
3/16	1/4	1-1/2	10°	1/8	020-0117-20*	M41511	020-0113-20*	3mm	020-3117-20		020-3113-20	23.24
1/4	1/4	1-1/2	10°	1/8	015-0097-20	M41512	015-0093-20	3mm	015-3097-20	M40518	015-3093-20	19.71
6mm	8mm	51mm	10°	-	-		-	6mm	052-6017-20*	M40519	052-6013-20*	21.36
1/4	5/16	2	10°	1/4	052-1017-20*	M41513	052-1013-20*	-	-		-	21.36
3/8	3/8	2-1/4	13°	-	-		-	6mm	052-6127-20	M40520	052-6123-20	29.88
1/2	1/2	2-1/4	16°	1/4	052-1027-20	M41514	-	6mm	052-6027-20	M40522	052-6023-20	40.19
1/2	1/2	2-1/4	28°	1/4	-		052-1003-20	6mm	052-6007-20		-	39.52
5/8	3/4	2-1/2	18°	-	-		-	6mm	052-6037-20		052-6033-20	51.30
5/8	3/4	2-1/2	18°	-	-		-	8mm	052-8037-20		052-8033-20	51.30
3/4	5/8	2-3/8	30°	-	-		-	6mm	052-6047-20		052-6043-20	58.38
3/4	5/8	2-3/8	30°	-	-		-	8mm	052-8047-20		052-8043-20	58.38

* Solid Carbide; all others have hardened steel shanks

Metric

Aluminium Cut Burrs



Cylindrical End Cut

CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	INCH/ METRIC SHANK SIZE	PRICE £
101-6010-00*	M40551	6mm	16mm	51mm	6mm	22.64
101-1010-00*	M40527	1/4	3/4	2	1/4	22.64
101-1020-00	M40528	3/8	3/4	2-1/2	1/4	34.02
101-6020-00	M40552	3/8	3/4	2-1/2	6mm	34.02
101-1030-00	M40529	1/2	1	2-3/4	1/4	48.69
101-6030-00	M40533	1/2	1	3-3/4	6mm	48.69
101-8030-00	M40554	1/2	1	2-3/4	8mm	48.69
101-1040-00	M40530	5/8	1	2-3/4	1/4	60.36
101-6040-00	M40555	5/8	1	2-3/4	6mm	60.36
101-8040-00	M40556	5/8	1	2-3/4	8mm	80.87
101-1050-00		3/4	1	2-3/4	1/4	84.94
101-6050-00	M40557	3/4	1	2-3/4	6mm	84.94
101-8050-00	M40558	3/4	1	2-3/4	8mm	98.47



Cylindrical Ball Nose

CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	INCH/ METRIC SHANK SIZE	PRICE £
102-6010-00*	M40559	6mm	20mm	51mm	6mm	25.50
102-1010-00*		1/4	3/4	2	1/4	25.50
102-1020-00	M40533	3/8	3/4	2-1/2	1/4	34.02
102-6020-00	M40560	3/8	3/4	2-1/2	6mm	34.02
102-1030-00	M40534	1/2	1	2-3/4	1/4	48.63
102-6030-00	M40561	1/2	1/2	3-3/4	6mm	48.63
102-8030-00		1/2	1/2	2-3/4	8mm	52.07
102-1130-00		5/8	1	2-3/4	1/4	74.64
102-6130-00		5/8	1	2-3/4	6mm	74.64
102-8130-00		5/8	1	2-3/4	8mm	78.30
102-1040-00		3/4	1	2-3/4	1/4	101.57
102-6040-00	M40565	3/4	1	2-3/4	6mm	101.57
102-8040-00	M40565	3/4	1	2-3/4	8mm	105.93



Round Nose Cone

CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	INCH/ METRIC SHANK SIZE	PRICE £
103-6010-00*	M40576	6mm	20mm	51mm	6mm	24.71
103-1010-00*	M40544	1/4	3/4	2	1/4	24.71
103-1020-00	M40545	3/8	3/4	2-1/2	1/4	35.98
103-6020-00	M40577	3/8	3/4	2-1/2	6mm	35.98
103-1030-00	M40546	1/2	1	2-3/4	1/4	50.49
103-6030-00	M40578	1/2	1	3-3/4	6mm	50.49
103-8030-00	M40579	1/2	1	2-3/4	8mm	54.29
103-1040-00	M40547	5/8	1	2-3/4	1/4	72.51
103-6040-00		5/8	1	2-3/4	6mm	82.08
103-8040-00		3/4	1	2-3/4	8mm	101.83



Egg Shape

CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	INCH/ METRIC SHANK SIZE	PRICE £
106-1010-00	M40541	3/8	3/4	2-1/2	1/4	37.45
106-6010-00	M40573	3/8	3/4	2-1/2	6mm	37.45
106-1020-00		1/2	1	2-3/4	1/4	45.41
106-6020-00	M40574	1/2	1	2-3/4	6mm	45.41
106-1030-00		5/8	1	2-3/4	1/4	80.36
106-6030-00		5/8	1	3-3/4	6mm	80.36



Round Nose Tree

CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	INCH/ METRIC SHANK SIZE	PRICE £
107-1000-00	M40548	3/8	3/4	2-1/2	1/4	46.13
107-6000-00	M40582	3/8	3/4	2-1/2	6mm	46.13
107-1010-00	M40549	1/2	1-1/8	3	1/4	63.60
107-6010-00	M40584	1/2	1-1/8	3	6mm	63.60
107-8010-00		1/2	1-1/8	3	8mm	69.84
107-1020-00	M40550	5/8	1-5/16	3-3/16	1/4	115.69
107-6020-00		5/8	1-5/16	3-3/16	6mm	115.69
107-8020-00	M40586	5/8	1-5/16	3-3/16	8mm	120.53
107-8030-00	M40587	5/8	1-5/16	3-3/16	8mm	137.36



Ball Shape

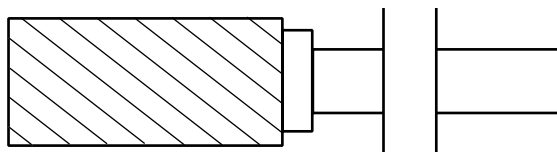
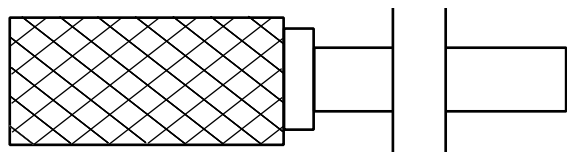
CATALOGUE No.	M NUMBER	CUTTER DIAMETER	OVERALL LENGTH	INCH/ METRIC SHANK SIZE	PRICE £
108-6010-00	M40567	6mm	51mm	6mm	24.85
108-1010-00*	M40537	1/4	2	1/4	24.85
108-1020-00	M40538	3/8	2-5/64	1/4	27.78
108-6020-00	M40568	3/8	2-5/64	6mm	27.78
108-1030-00	M40539	1/2	2-13/64	1/4	40.05
108-6030-00	M40569	1/2	2-13/64	6mm	40.05
108-8030-00	M40570	1/2	2-13/64	8mm	43.91
108-1040-00	M40540	5/8	2-5/16	1/4	71.47
108-6040-00	M40571	5/8	2-5/16	6mm	71.47
108-8040-00	M40572	5/8	2-5/16	8mm	75.05

* Solid Carbide; all others have hardened steel shanks

Extended Shank Burrs

Cylindrical

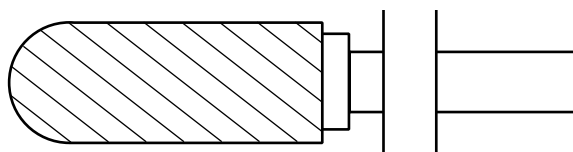
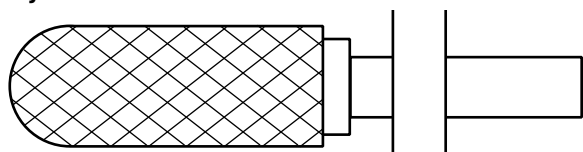
6" Long Steel Shank 1/4" Shank Diameter



CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
MASTER CUT					
041-1627-20	M41212	1/4	5/8	6-5/8	26.50
041-1667-20	M41215	3/8	3/4	6-3/4	33.94
041-1687-20	M41218	1/2	1	7	51.29

CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
RIGHT HAND SPIRAL					
041-1623-20		1/4	5/8	6-5/8	26.50
041-1663-20	M40215	3/8	3/4	6-3/4	33.94
041-1683-20	M40218	1/2	1	7	51.29

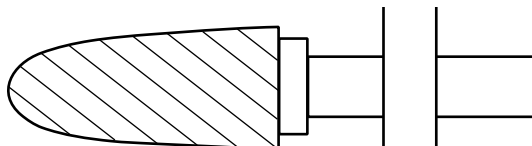
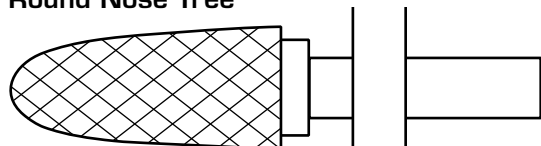
Cylindrical Ball Nose



CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
MASTER CUT					
042-1627-20		1/4	5/8	6-5/8	29.52
042-1657-20		3/8	3/4	6-3/4	36.62
042-1667-20	M41300	1/2	1	7	57.57

CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
RIGHT HAND SPIRAL					
042-1623-20		1/4	5/8	6-5/8	29.52
042-1653-20		3/8	3/4	6-3/4	36.62
042-1663-20		1/2	1	7	57.57

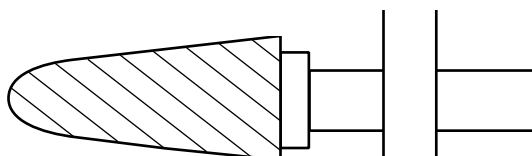
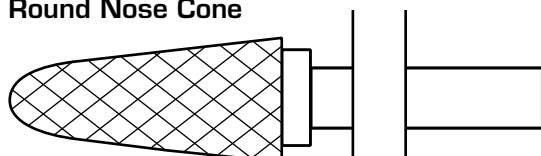
Round Nose Tree



CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
MASTER CUT					
043-1617-20	M41384	1/4	5/8	6-5/8	31.35
043-1637-20	M41386	3/8	3/4	6-3/4	34.65
043-1667-20	M41390	1/2	1	7	52.87

CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
RIGHT HAND SPIRAL					
043-1613-20	M40384	1/4	5/8	6-5/8	31.35
043-1633-20		3/8	3/4	6-3/4	34.65
043-1663-20		1/2	1	7	52.87

Round Nose Cone



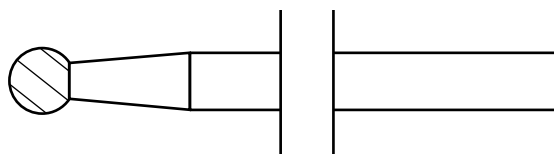
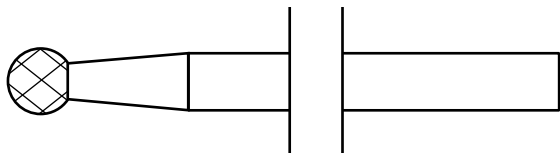
CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
MASTER CUT					
047-1617-20	M41465	1/4	5/8	6-5/8	29.07
047-1637-20	M41468	3/8	1-1/16	7-3/16	44.54
047-1647-20	M41470	1/2	1-1/8	7-1/4	54.66

CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
RIGHT HAND SPIRAL					
047-1613-20	M40465	1/4	5/8	6-5/8	29.07
047-1633-20		3/8	1-1/16	7-3/16	44.54
047-1643-20		1/2	1-1/8	7-1/4	54.66

Extended Shank Burrs

Ball Shape

6" Long Steel Shank 1/4" Shank Diameter

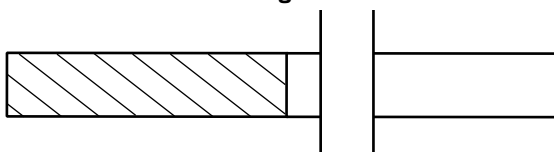
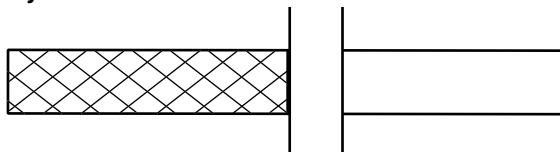


CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
MASTER CUT					
048-1637-20	M41332	1/4	1/4	6-1/4	28.30
048-1657-20	M41335	3/8	3/8	6-3/8	29.97
048-1667-20	M41338	1/2	1/2	6-1/2	38.43

CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
RIGHT HAND SPIRAL					
048-1613-20	M40332	1/4	1/4	6-1/4	28.30
048-1653-20	M40335	3/8	3/8	6-3/8	29.97
048-1663-20	M40338	1/2	1/2	6-1/2	38.43

Cylindrical

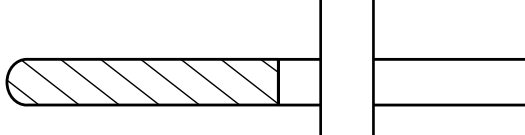
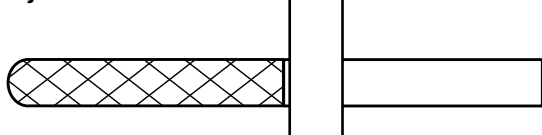
1/8" Diameter Solid Carbide 2" and 3" Overall Length



CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
MASTER CUT					
011-0127-20	M41203	1/8	9/16	2	14.91
011-0137-20	M41204	1/8	9/16	3	14.91

CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
RIGHT HAND SPIRAL					
011-0123-20	M40203	1/8	9/16	2	14.91
011-0133-20	M40204	1/8	9/16	3	14.91

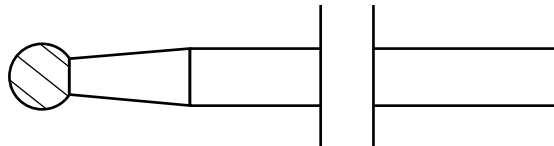
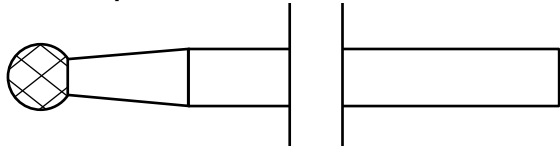
Cylindrical Ball Nose



CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
MASTER CUT					
011-0227-20	M41286	1/8	9/16	2	15.23
011-0237-20	M41287	1/8	9/16	3	15.23

CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
RIGHT HAND SPIRAL					
011-0223-20		1/8	9/16	2	15.23
011-0233-20		1/8	9/16	3	15.23

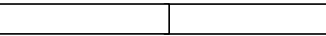
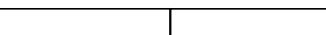
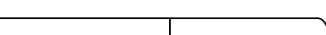
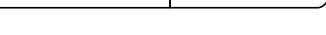
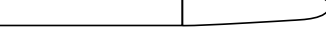
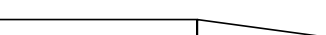
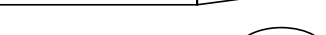
Ball Shape

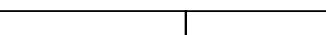
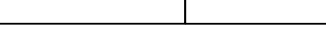
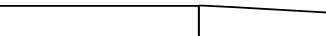
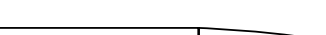
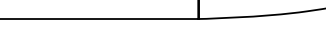
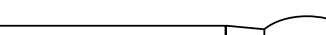


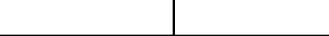
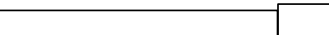
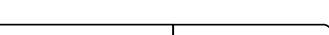
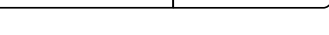
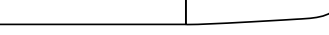
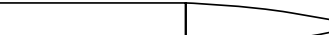
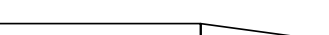
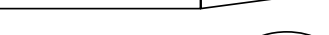
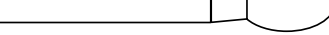
CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
MASTER CUT					
011-0827-20		1/8	1/8	2	15.23
011-0837-20		1/8	1/8	3	15.23

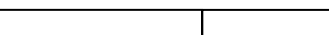
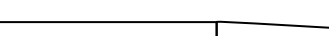
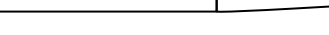
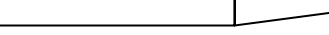
CATALOGUE No.	M NUMBER	CUTTER DIAMETER	LENGTH OF CUT	OVERALL LENGTH	PRICE £
RIGHT HAND SPIRAL					
011-0823-20		1/8	1/8	2	15.23
011-0833-20		1/8	1/8	3	15.23

Carbide Burr Sets

STYLE "A" BURRS - 9 PIECES					
CATALOGUE No.	M NUMBER	CUT DIA.	SHANK DIA.		PRICE £
401-1000-00	M40588	1/8"	1/8"	MASTER CUT	100.22
One each of the following					
				#010-0017-20	
				#010-0027-20	
				#010-0037-20	
				#010-0077-20	
				#010-0057-20	
				#010-0177-20	
				#010-0117-20	
				#010-0097-20	
				#010-0087-20	
For metric version of this set please order the following part numbers					
CATALOGUE No.	M NUMBER	CUT DIA.	SHANK DIA.		PRICE £
401-1000-06	M40589	3mm	3mm	MASTER CUT	100.22
401-3003-20	M40590	3mm	3mm	R.H. SPIRAL	100.22

STYLE "C" BURRS - 8 PIECES					
CATALOGUE No.	M NUMBER	CUT DIA.	SHANK DIA.		PRICE £
401-1034-00		1/4"	1/4"	MASTER CUT	199.24
One each of the following					
				#041-0027-20	
				#042-0027-20	
				#043-1017-20	
				#044-1017-20	
				#045-1027-20	
				#046-1017-20	
				#047-1017-20	
				#048-1037-20	
For metric version of this set please order the following part numbers					
CATALOGUE No.	M NUMBER	CUT DIA.	SHANK DIA.		PRICE £
401-6017-20		6mm	6mm	MASTER CUT	199.24
401-6017-30		3/8"	6mm	MASTER CUT	211.30
401-6014-40		3/8"	6mm	R.H. SPIRAL	211.30

STYLE "B" BURRS - 9 PIECES					
CATALOGUE No.	M NUMBER	CUT DIA.	SHANK DIA.		PRICE £
401-3000-00		1/4"	1/8"	MASTER CUT	150.04
One each of the following					
				#015-0017-21	
				#015-0067-21	
				#015-0027-20	
				#015-0037-20	
				#015-0047-20	
				#015-0057-20	
				#015-0087-20	
				#015-0077-20	
				#015-0097-20	
For metric version of this set please order the following part numbers					
CATALOGUE No.	M NUMBER	CUT DIA.	SHANK DIA.		PRICE £
401-3007-20		1/4"	3mm	MASTER CUT	150.04

STYLE "C" BURRS - 8 PIECES					
CATALOGUE	M NUMBER	CUT DIA.	SHANK DIA.		PRICE £
401-1031-00		1/2"	1/4"	MASTER CUT	296.67
One each of the following					
				#041-0087-20	
				#042-1067-20	
				#043-1067-20	
				#044-1057-20	
				#045-1057-20	
				#046-1037-20	
				#047-1047-20	
				#048-1067-20	
For metric version of this set please order the following part numbers					
CATALOGUE No.	M NUMBER	CUT DIA.	SHANK DIA.		PRICE £
401-6007-20		1/2"	6mm	MASTER CUT	296.67

Hardness Comparisons

Rm			Vickers HV	Brinell HB	Rockwell HRB	Rockwell HRC
N/mm ²	kg/mm ²	ton/in ²				
255	26	16.5	80	76		
270	28	17.5	85	81	41	
285	29	18.5	90	86	48	
305	31	20	95	90	52	
320	33	20.5	100	95	56	
335	34	21.5	105	100	59	
350	36	22.5	110	105	62	
370	38	24	115	109	64.5	
385	39	25	120	114	67	
400	41	26	125	119	69	
415	42	27	130	124	71	
430	44	28	135	128	73	
450	46	29	140	133	75	
465	47	30	145	138	77	
480	49	31	150	143	78.5	
495	50	32	155	147	80	
510	52	33	160	152	81.5	
530	54	34.5	165	157	83	1
545	56	35.5	170	162	85	3
560	57	36.5	175	166	86	4
575	59	37.5	180	171	87	5
595	61	38.5	185	176	88	7
610	62	39.5	190	181	89.5	9
625	64	40.5	195	185	91	11
640	65	41.5	200	190	91.5	13
660	67	43	205	195	92.5	15
675	69	43.5	210	200	93.5	16
690	70	44.5	215	204	94	17
705	72	45.5	220	209	95	18
720	73	46.5	225	214	93	19
740	75	48	230	219	96.5	19.5
755	77	49	235	223	97	20
770	79	50	240	228	98	21
785	80	51	245	233	99	21.5
800	82	52	250	238	99.5	22
820	84	53	255	242		23
835	85	54	260	247		24
850	87	55	265	252		25
865	88	56	270	257		25.5
880	90	57	275	261		26.5
900	92	58.5	280	266		27
915	93	59.5	285	271		28
930	95	60.5	290	276		28.5
950	97	61.5	295	280		29
965	98	62.5	300	285		30
995	101	64.5	310	295		31
1030	105	66.5	320	304		32
1060	105	66.5	320	314		33.5
1095	112	71	340	323		34.5

Rm			Vickers HV	Brinell HB	Rockwell HRB	Rockwell HRC
N/mm ²	kg/mm ²	ton/in ²				
1125	115	73	350	333		35.5
1155	118	75	360	342		36.5
1190	121	77	370	352		37.5
1220	124	79	380	361		39
1255	128	81.5	390	371		40
1290	132	83.5	400	380		41
1320	135	85.5	410	390		42
1350	138	87.5	420	399		42.5
1385	141	89.5	430	409		43.5
1420	145	92	440	418		44.5
1455	148	94.5	450	428		45.5
1485	151	96	460	437		46
1520	155	98.5	470	447		47
1555	159	101	480	(456)		47.5
1595	163	103.5	490	(466)		48.5
1630	166	105.3	500	(475)		49
1665	170	108	510	(485)		50
1700	173	110	520	(494)		50.5
1740	177	113	530	(504)		51
1775	181	115	540	(513)		51.5
1810	185	117.5	550	(523)		52.5
1845	188	119.5	560	(532)		53
1880	192	122	570	(542)		53.5
1920	196	124.5	580	(551)		54
1955	199	126.5	590	(561)		54.5
1995	203	129.5	600	(570)		55
2030	207	131.5	610	(580)		55.5
2070	211	134	620	(589)		56.5
2105	215	136.5	630	(599)		57
2145	219	139	640	(608)		57.5
2180	222	141.5	650	(618)		58
			660			58.5
			670			59
			680			59
			690			59.5
			700			60
			720			61
			740			62
			760			62.5
			780			63.5
			800			64
			820			64.5
			840			65.5
			860			66
			880			66.5
			900			67
			920			67.5
			940			68

English to Metric

MULTIPLY	BY	TO OBTAIN
Inches	25.4	Millimetres
Inches	2.54	Centimetres
Feet	.3048	Metres
Inches per minute	25.4	Millimetres per minute
Cubic Inches per minute	16.387	Cubic Centimetres per minute
Surface Feet per minute	.3048	Surface Metres per minute

Metric to English

MULTIPLY	BY	TO OBTAIN
Millimetres	.0394	Inches
Centimetres	.3937	Inches
Metres	3.2808	Feet
Millimetres per minute	.0394	Inches per minute
Cubic Centimetres per minute	.0610	Cubic Inches per minute
Surface Metres per minute	3.2808	Surface Feet per minute

Useful Formulas

Milling

$$\begin{aligned} \text{Cutting Speed } V_c &= \frac{d \times \pi \times n}{1000} \quad (\text{m/min}) \\ \text{Spindle Speed } n &= \frac{V_c \times 1000}{\pi \times d} \quad (\text{rpm}) \\ \text{Feed per Tooth } F_z &= \frac{V_f}{z \times n} \quad (\text{mm}) \\ \text{Table Feed } V_f &= f_z \times z \times n \quad (\text{mm/min}) \end{aligned}$$

Symbols

$$\begin{aligned} \text{No. of Flutes} &= z \\ \text{Spindle Speed} &= n \quad (\text{rpm}) \\ \text{Tool Diameter} &= d \quad (\text{mm}) \\ \pi &= 3.142 \end{aligned}$$

Cutting Tool Usage Safety Information

Essential Safety Instructions

Tool Usage Hazards

In use, cutting tools may create sharp edges, vibrations, high temperatures and forces not only within the tool itself but also the work piece and waste produced. This can cause fragmentation of the tool and/or work piece due to excess stress or impact damage.

Avoiding Injury

When working with, or in the vicinity of cutting tools, all personnel should wear appropriate protective equipment at all times. Machine guards should be in place at all times.

Please Note:

It is the user's responsibility to determine the suitability of any tool for their specific application and ensure its safe usage.

Conversion Chart

Decimal (mm)	Sizes	Decimal (ins)	Decimal (mm)	Sizes	Decimal (ins)	Decimal (mm)	Sizes	Decimal (ins)	Decimal (mm)	Sizes	Decimal (ins)	Decimal (mm)	Sizes	Decimal (ins)
.794	1/32	.0312	2.383	3/32	.0938	4.700	13	.1850	7.366	L	.2900	12.000		.4724
.800		.0315	2.400		.0945	4.750		.1870	7.400		.2913	12.304	31/64	.4844
.813	67	.0320	2.438	41	.0960	4.763	3/16	.1875	7.493	M	.2950	12.500		.4921
.838	66	.0330	2.450		.0965	4.800	12	.1890	7.500		.2953	12.700	1/2	.5000
.851		.0335	2.489	40	.0980	4.850	11	.1910	7.541	19/64	.2969	13.000		.5118
.889	65	.0350	2.500		.0984	4.900		.1929	7.600		.2992	13.096	33/64	.5156
.900		.0354	2.527	39	.0995	4.915	10	.1935	7.671	N	.3020	13.492	17/32	.5312
.914	64	.0360	2.578	38	.1015	4.978	9	.1960	7.700		.3031	13.500		.5315
.940	63	.0370	2.600		.1024	5.000		.1969	7.750		.3051	13.891	35/64	.5469
.950		.0374	2.642	37	.1040	5.055	8	.1990	7.800		.3071	14.000		.5512
.965	62	.0380	2.700		.1063	5.100		.2008	7.900		.3110	14.287	9/16	.5625
.991	61	.0390	2.705	36	.1065	5.105	7	.2010	7.938	5/16	.3125	14.500		.5709
1.000		.0394	2.750		.1083	5.159	13/64	.2031	8.000		.3150	14.684	37/64	.5781
1.016	60	.0400	2.779	7/64	.1094	5.182	6	.2040	8.026	O	.3160	15.000		.5906
1.041	59	.0410	2.794	35	.1100	5.200		.2047	8.100		.3189	15.083	19/32	.5938
1.049		.0413	2.800		.1102	5.220	5	.2055	8.200		.3228	15.479	39/64	.6094
1.067	58	.0420	2.819	34	.1110	5.250		.2067	8.204	P	.3230	15.500		.6102
1.092	57	.0430	2.870	33	.1130	5.300		.2087	8.250		.3248	15.875	5/8	.6250
1.100		.0433	2.900		.1142	5.309	4	.2090	8.300		.3268	16.000		.6299
1.151		.0453	2.946	32	.1160	5.400		.2126	8.334	21/64	.3281	16.271	41/64	.6406
1.181	56	.0465	3.000		.1181	5.410	3	.2130	8.400		.3307	16.500		.6496
1.191	3/64	.0469	3.048	31	.1200	5.500		.2165	8.433	Q	.3320	16.667	21/32	.6562
1.200		.0472	3.100		.1220	5.558	7/32	.2188	8.500		.3346	17.000		.6693
1.250		.0492	3.175	1/8	.1250	5.600		.2205	8.600		.3386	17.066	43/64	.6719
1.300		.0512	3.200		.1260	5.613	2	.2210	8.611	R	.3390	17.463	11/16	.6875
1.321	55	.0520	3.250		.1280	5.700		.2244	8.700		.3425	17.500		.6890
1.349		.0531	3.264	30	.1285	5.750		.2264	8.733	11/32	.3438	17.859	45/64	.7031
1.397	54	.0550	3.300		.1299	5.791	1	.2280	8.750		.3445	18.000		.7087
1.400		.0551	3.400		.1339	5.800		.2283	8.800		.3465	18.258	23/32	.7188
1.450		.0571	3.454	29	.1360	5.900		.2323	8.839	S	.3480	18.500		.7283
1.500		.0591	3.500		.1378	5.944	A	.2340	8.900		.3504	18.654	47/64	.7344
1.511	53	.0595	3.569	28	.1405	5.954	15/64	.2344	9.000		.3543	19.000		.7480
1.550		.0610	3.571	9/64	.1406	6.000		.2362	9.039	T	.3580	19.050	3/4	.7500
1.588	1/16	.0625	3.600		.1417	6.045	B	.2380	9.100		.3583	19.446	49/64	.7656
1.600		.0630	3.658	27	.1440	6.100		.2402	9.129	23/64	.3594	19.500		.7677
1.613	52	.0635	3.700		.1457	6.147	C	.2420	9.200		.3622	19.842	25/32	.7812
1.650		.0650	3.734	26	.1470	6.200		.2441	9.250		.3642	20.000		.7874
1.700		.0669	3.750		.1476	6.248	D	.2460	9.300		.3661	20.241	51/64	.7969
1.702	51	.0670	3.797	25	.1495	6.250		.2461	9.347	U	.3680	20.500		.8071
1.750		.0689	3.800		.1496	6.300		.2480	9.400		.3701	20.638	13/16	.8125
1.778	50	.0700	3.861	24	.1520	6.350	E	.2500	9.500		.3740	21.000		.8268
1.800		.0709	3.900		.1536	6.350	1/4	.2500	9.525	3/8	.3750	21.034	53/64	.8281
1.850		.0728	3.912	23	.1540	6.400		.2520	9.576	V	.3770	21.433	27/32	.8438
1.854	49	.0730	3.962	5/32	.1562	6.500		.2559	9.600		.3780	21.500		.8465
1.900		.0748	3.988	22	.1570	6.528	F	.2570	9.700		.3819	21.829	55/64	.8594
1.930	48	.0760	4.000		.1575	6.600		.2598	9.750		.3839	22.000		.8661
1.950		.0768	4.039	21	.1590	6.629	G	.2610	9.800		.3858	22.225	7/8	.8750
1.984	5/64	.0781	4.089	20	.1610	6.700		.2638	9.804	W	.3860	22.500		.8858
1.994	47	.0785	4.100		.1614	6.746	17/64	.2656	9.900		.3898	22.261	57/64	.8906
2.000		.0787	4.200		.1654	6.750		.2657	9.921	25/64	.3906	23.000		.9055
2.050		.0807	4.216	19	.1660	6.756	H	.2660	10.000		.3937	23.017	29/32	.9062
2.057	46	.0810	4.250		.1673	6.800		.2677	10.084	X	.3970	23.416	59/64	.9219
2.083	45	.0820	4.300		.1693	6.900		.2717	10.262	Y	.4040	23.500		.9252
2.100		.0827	4.305	18	.1695	6.909	I	.2720	10.317	13/32	.4062	23.813	15/16	.9375
2.150		.0846	4.366	11/64	.1719	7.000		.2756	10.490	Z	.4130	24.000		.9449
2.184	44	.0860	4.394	17	.1730	7.036	J	.2770	10.500		.4134	24.209	61/64	.9531
2.200		.0866	4.400		.1732	7.100		.2795	10.716	27/64	.4219	24.500		.9646
2.250		.0886	4.496	16	.1770	7.137	K	.2810	11.000		.4331	24.608	31/32	.9688
2.260	43	.0890	4.500		.1772	7.142	9/32	.2812	11.113	7/16	.4375	25.000		.9843
2.300		.0906	4.572	15	.1800	7.200		.2835	11.500		.4528	25.004	63/64	.9844
2.350		.0925	4.600		.1811	7.250		.2854	11.509	29/64	.4531	25.400		1.000
2.375	42	.0935	4.623	14	.1820	7.300		.2874	11.908	15/32	.4688			

Terms and Conditions of Sale

1. Interpretation

1.1. The definitions and rules of interpretation in this condition apply in these conditions.

"Buyer"	the person, firm or company who purchases the Goods from ITC;
"ITC"	Industrial Tooling Corporation Limited (Company No. 2573537) the registered office of which is at Cyber House, Unit 1 Kepler, Lichfield Road Industrial Estate, Tamworth, B79 7XE;
"Contract"	any contract between ITC and the Buyer for the sale and purchase of the Goods, incorporating these conditions;
"Delivery Point"	the place where delivery of the Goods is to take place under condition 4;
"Goods"	any goods agreed in the Contract to be supplied to the Buyer by ITC (including any part or parts of them);
"Intellectual Property"	any copyrights, letters, patents, know how, inventions, utility models, registered and unregistered designs, trade and service marks, trade names, logos, patent applications, rights in the nature of copyrights and all other similar rights in the Goods and (where applicable) the Services; and
"Services"	any services agreed in the Contract to be supplied to the Buyer by ITC.

1.2. A reference to a particular law is a reference to it as it is in force for the time being taking account of any amendment, extension, application or re-enactment and includes any subordinate legislation for the time being in force made under it.

1.3. Words in the singular include the plural and in the plural include the singular.

1.4. A reference to one gender includes a reference to the other gender.

1.5. Condition headings do not affect the interpretation of these conditions.

2. Application of terms

2.1. Subject to any variation under condition 2.3 the Contract shall be on these conditions to the exclusion of all other terms and conditions (including any terms or conditions which the Buyer purports to apply under any purchase order, confirmation of order, specification or other document).

2.2. No terms or conditions endorsed on, delivered with or contained in the Buyer's purchase order, confirmation of order, specification or other document shall form part of the Contract simply as a result of such document being referred to in the Contract.

2.3. These conditions apply to all ITC's sales and any variation to these conditions and any representations about the Goods or the Services shall have no effect unless expressly agreed in writing and signed by a director of ITC. The Buyer acknowledges that it has not relied on any statement, promise or representation made or given by or on behalf of ITC which is not set out in the Contract. Nothing in this condition shall exclude or limit ITC's liability for fraudulent misrepresentation.

2.4. Each order or acceptance of a quotation for Goods or Services by the Buyer from ITC shall be deemed to be an offer by the Buyer to buy Goods and/or Services subject to these conditions. The Buyer shall ensure that the minimum value of its order is not less than the sum set out in clause 7.2.

2.5. No order placed by the Buyer shall be deemed to be accepted by ITC until a written acknowledgement of order is issued by ITC or (if earlier) ITC delivers the Goods to the Buyer or provides the Services to the Buyer.

2.6. The Buyer shall ensure that the terms of its order and any applicable specification are complete and accurate.

2.7. Any quotation is given on the basis that no Contract shall come into existence until ITC despatches an acknowledgement of order to the Buyer. Any quotation is valid for a period of 60 days only from its date, provided that ITC has not previously withdrawn it.

2.8. Acceptance of delivery of the Goods or performance of the Services shall be deemed conclusive evidence of the Buyer's acceptance of these Conditions.

2.9. Any typographical, clerical or other error or omission in any sales literature, quotation, acceptance of offer, invoice or other document or information issued by ITC shall be subject to correction without any liability on the part of ITC.

3. Description

3.1. The quantity and description of the Goods or the Services to be performed shall be as set out in ITC's quotation or acknowledgement of order.

3.2. All samples, drawings, descriptive matter, specifications and advertising issued by ITC and any descriptions or illustrations contained in ITC's catalogues or brochures are issued or published for the sole purpose of giving an approximate idea of the Goods described in them. They shall not form part of the Contract and this is not a sale by sample.

3.3. If the Goods are to be manufactured or as part of the Services any process is to be applied to the Goods by ITC; or if the Goods or Services are to be provided in accordance with a specification or any other document, data information or materials submitted by the Buyer, the Buyer shall indemnify ITC against all loss, damages, costs and expenses awarded against or incurred by ITC in connection with or paid or agreed to be paid by ITC in settlement of any claim for infringement of any patent, copyright, design, trade mark or other industrial or intellectual property rights of any other person which results from ITC's use of the Buyer's information.

3.4. ITC reserves the right to make any changes in the specification of the Goods which are required to conform with any applicable statutory or EC requirements or, where the Goods are to be supplied to ITC's specification, which do not materially affect their quality or performance.

3.5. No order which has been accepted by ITC may be cancelled by the Buyer except with the agreement in writing of ITC and on terms that the Buyer shall indemnify ITC in full against all loss (including without prejudice to the generality of the foregoing loss of profit), costs (including without prejudice to the generality of the foregoing cost of all labour and materials ordered, whether used or un-used), damages, charges and expenses incurred by ITC as a result of cancellation.

4. Delivery

4.1. Unless otherwise agreed in writing by ITC, delivery of the Goods shall take place at ITC's place of business.

4.2. The Buyer shall take delivery of the Goods within 7 days of ITC giving it notice that the Goods are ready for delivery.

4.3. Any dates specified by ITC for delivery of the Goods or the performance of the Services are intended to be an estimate and time for delivery shall not be made of the essence by notice. If no dates are so specified, delivery and performance shall be within a reasonable time.

4.4. Subject to the other provisions of these conditions ITC shall not be liable for any direct, indirect or consequential loss (all three of which terms include, without limitation, pure economic loss, loss of profits, loss of business, depletion of goodwill and similar loss), costs, damages, charges or expenses caused directly or indirectly by any delay in the delivery of the Goods or the performance of the Services (even if caused by ITC's negligence), nor shall any delay entitle the Buyer to terminate or rescind the Contract unless such delay exceeds 180 days.

4.5. If for any reason the Buyer fails to accept delivery of any of the Goods when they are ready for delivery, or ITC is unable to deliver the Goods on time because the Buyer has not provided appropriate instructions, documents, licences or authorisations:

4.5.1. risk in the Goods shall pass to the Buyer;

4.5.2. the Goods shall be deemed to have been delivered;

4.5.3. ITC may store the Goods until delivery, whereupon the Buyer shall be liable for all related costs and expenses (including, without limitation, storage and insurance); and

4.5.4. sell the Goods at the best price readily attainable and (after deducting any costs for storage and other selling expenses) account to the Buyer for the excess over the price or charge the Buyer for any shortfall below the price under the Contract.

4.6. The Buyer shall provide at the Delivery Point and at its expense adequate and appropriate equipment and manual labour for loading the Goods.

4.7. If ITC delivers to the Buyer a quantity of Goods (being bespoke, non-stock items) of up to 10% more or less than the quantity accepted by ITC, the Buyer shall be entitled to object to or reject the Goods or any of them by reason of the surplus or shortfall and shall pay for such goods at the pro rata Contract rate.

4.8. ITC may deliver the Goods by separate instalments. Each separate instalment shall be invoiced and paid for in accordance with the provisions of the Contract.

4.9. Each instalment shall be a separate Contract and no cancellation or termination of any one Contract relating to an instalment shall entitle the Buyer to repudiate or cancel any other Contract or instalment.

5. Non-delivery

5.1. The quantity of any consignment of Goods as recorded by ITC on despatch from ITC's place of business shall be conclusive evidence of the quantity received by the Buyer on delivery unless the Buyer can provide conclusive evidence proving the contrary.

5.2. ITC shall not be liable for any non-delivery of Goods (even if caused by ITC's negligence) unless the Buyer gives written notice to ITC of the non-delivery within 3 days of the date when the Goods would in the ordinary course of events have been received.

5.3. Any liability of ITC for non-delivery of the Goods shall be limited to replacing the Goods within a reasonable time or issuing a credit note at the pro rata Contract rate against any invoice raised for such Goods.

6. Risk/title

6.1.1. Risk of damage to or loss of the Goods shall pass to the Buyer:

6.1.2. in the case of Goods to be delivered at ITC's premises, at the time when ITC notifies the Buyer that the Goods are available for collection; or
6.1.2. in the case of Goods to be delivered otherwise than at ITC's premises, at the time of delivery, or if the Buyer wrongfully fails to take delivery of the Goods, the time when ITC has tendered delivery of the Goods.

6.1.3. in respect of deliveries made in accordance with clause 6.1(b) above and notwithstanding any other provision contained in these Conditions, a transportation insurance policy shall be taken out by the Buyer's written request and at the Buyer's expense.

6.2. Ownership of the Goods shall not pass to the Buyer until ITC has received in full (in cash or cleared funds) all sums due to it in respect of:

6.2.1. the Goods; and

6.2.2. all other sums which are or which become due to ITC from the Buyer on any account.

6.3. Until ownership of the Goods has passed to the Buyer, the Buyer shall:

6.3.1. hold the Goods on a fiduciary basis as ITC's bailee;

6.3.2. store each consignment of the Goods (at no cost to ITC) separately from all other goods purchased from ITC and those of the Buyer or any third party in such a way that they remain readily identifiable as ITC's property;

6.3.3. not remove, destroy, deface or obscure any identifying mark or packaging on or relating to the Goods; and

6.3.4. maintain the Goods in satisfactory condition and keep them insured on ITC's behalf for their full price against all risks to the reasonable satisfaction of ITC. On request the Buyer shall produce the policy of insurance to ITC.

6.4. The Buyer may resell the Goods before ownership has passed to it solely on the following conditions:

6.4.1. any sale shall be effected in the ordinary course of the Buyer's business at full market value; and

6.4.2. any such sale shall be a sale of ITC's property on the Buyer's own behalf and the Buyer shall deal as principal when making such a sale.

6.5. The Buyer's right to possession of the Goods shall terminate immediately if:

6.5.1. the Buyer has a bankruptcy order made against him or makes an arrangement or composition with his creditors, or otherwise takes the benefit of any statutory provision for the time being in force for the relief of insolvent debtors, or (being a body corporate) convenes a meeting of creditors (whether formal or informal), or enters into liquidation (whether voluntary or compulsory) except a solvent voluntary liquidation for the purpose only of reconstruction or amalgamation, or has a receiver and/or manager, administrator or administrative receiver appointed of its undertaking or any part thereof, or documents are filed with the court for the appointment of an administrator of the Buyer or notice of intention to appoint an administrator is given by the Buyer or its directors or by a qualifying floating charge holder (as defined in paragraph 14 of Schedule B1 to the Insolvency Act 1986), or a resolution is passed or a petition presented to any court for the winding-up of the Buyer or for the granting of an administration order in respect of the Buyer, or any proceedings are commenced relating to the insolvency or possible insolvency of the Buyer; or

6.5.2. the Buyer suffers or allows any execution, whether legal or equitable, to be levied on his/its property or obtained against him/it, or fails to observe or perform any of his/its obligations under the Contract or any other contract between ITC and the Buyer, or is unable to pay its debts within the meaning of section 123 of the Insolvency Act 1986 or the Buyer ceases to trade; or

6.5.3. the Buyer encumbers or in any way charges any of the Goods.

6.6. ITC shall be entitled to recover payment for the Goods or the Services notwithstanding that ownership of any of the Goods has not passed from ITC.

6.7. The Buyer grants ITC, its agents and employees an irrevocable licence at any time to enter any premises where the Goods are or may be stored in order to inspect them, or where the Buyer's right of possession has terminated, to recover them.

6.8. Where ITC is unable to determine whether any Goods are the goods in respect of which the Buyer's right to possession has terminated, the Buyer shall be deemed to have sold all goods of the kind sold by ITC to the Buyer in the order in which they were invoiced to the Buyer.

6.9. On termination of the Contract, howsoever caused, ITC's (but not the Buyer's) rights contained in this condition 6 shall remain in effect.

7. Price

7.1. Unless otherwise agreed by ITC in writing, the price for the Goods shall be the price set out in ITC's price list published on the date of delivery or deemed delivery. The price for the Services shall be in accordance with the quotation provided by ITC to the Buyer in accordance with clause 3.1.

7.2. The minimum value of the Buyer's order shall be not less than £20.00.

7.3. The price for the Goods shall be exclusive of any value added tax and all costs and charges in relation to packaging, loading, unloading, carriage and insurance, all of which amounts the Buyer shall pay in addition when it is due to pay for the Goods.

7.4. In the event that the Buyer's order is to be delivered to the Buyer then the Buyer shall pay for the costs of carriage notified to the Buyer by ITC from time to time.

7.5. ITC reserves the right, by giving notice to the Buyer at any time before the delivery to increase the price and/or the ancillary costs to reflect any increase in the cost to ITC which is due to any factor beyond the control of ITC (such as, without limitation, any foreign exchange fluctuation, currency regulation, alteration of taxes, levies or duties, significant increase in the costs of labour, materials or other costs of manufacture), any change in delivery dates, quantities or specifications for the Goods or change to the required Services which is requested by the Buyer, or any delay caused by any instructions of the Buyer or failure of the Buyer to give ITC adequate information or instructions.

8. Payment

8.1. Subject to condition 8.4, payment of the price for the Goods or the Services is (unless otherwise agreed in writing by the parties) due in pounds sterling on the last working day of the month following the month in which the Goods are delivered or deemed to be delivered. ITC reserves the right to request payment for the Goods and/or Services in advance.

8.2. Time for payment shall be of the essence.

8.3. No payment shall be deemed to have been received until ITC has received cleared funds.

8.4. All payments payable to ITC under the Contract shall become due immediately on its termination despite any other provision.

8.5. The Buyer shall make all payments due under the Contract in full without any deduction whether by way of set-off, counterclaim, discount, abatement or otherwise unless the Buyer has a valid court order requiring an amount equal to such deduction to be paid by ITC to the Buyer.

8.6. If the Buyer fails to pay ITC any sum due pursuant to the Contract, the Buyer shall be liable to pay interest to ITC on such sum from the due date for payment at the annual rate of 8% above the base lending rate from time to time of National Westminster Bank plc, accruing on a daily basis until payment is made, whether before or after any judgment. ITC reserves the right to claim interest under the Late Payment of Commercial Debts (Interest) Act 1998.

9. Quality

9.1. Where ITC is not the manufacturer of the Goods, ITC shall endeavour to transfer to the Buyer the benefit of any warranty or guarantee given to ITC.

9.2. ITC warrants that:-

9.2.1. (subject to the other provisions of these conditions) on delivery that the Goods shall be of satisfactory quality within the meaning of the Sale of Goods Act 1979;

9.2.2. bought if the Buyer had made known that purpose to ITC in writing and ITC has confirmed in writing that it is reasonable for the Buyer to rely on the skill; and

9.2.3. that the Services will be provided using reasonable care and skill and, as far as reasonably possible, in accordance with the Contract and at the intervals and within the times referred to in the Contract.

9.3. The above warranty is given by ITC subject to the following conditions:

9.3.1. ITC shall be under no liability if it is established by ITC that some part of the material used in manufacture was defective;

9.3.2. ITC shall be under no liability in respect of any defect in the Goods or Services arising from any drawing, design or specification supplied by the Buyer;

9.3.3. ITC shall be under no liability under the above warranty (or any other warranty, condition or guarantee) if the Price and all ancillary costs have not been paid by the due date for payment.

9.4. ITC shall not be liable for a breach of either of the warranties in condition 9.2 unless:

9.4.1. the Buyer gives written notice of the defect to ITC, and, if the defect is as a result of damage in transit to the carrier, within 7 days of the time when the Buyer discovers or ought to have discovered the defect; and

9.4.2. ITC is given a reasonable opportunity after receiving the notice of examining such Goods and the Buyer (if asked to do so by ITC) returns such Goods to ITC's place of business at ITC's cost for the examination to take place there.

9.5. ITC shall not be liable for a breach of either of the warranties in condition 9.2 if:

9.5.1. the Buyer makes any further use of such Goods after giving such notice; or

9.5.2. the defect arises because the Buyer failed to follow ITC's oral or written instructions as to the storage, installation, commissioning, use or maintenance of the Goods or (if there are none) good trade practice; or

9.5.3. the Buyer alters or repairs such Goods without the written consent of ITC.

9.6. Subject to condition 9.5, if any of the Goods do not conform with either of the warranties in condition 9.2 ITC shall at its option repair or replace such Goods (or the defective part) or refund the price of such Goods at the pro rata Contract rate provided that, if ITC so requests, the Buyer shall, at ITC's expense, return the Goods or the part of such Goods which is defective to ITC.

9.7. If ITC complies with condition 9.6 it shall have no further liability for a breach of either of the warranties in condition 9.2 in respect of such Goods.

10. Limitation of liability

10.1. Subject to condition 4, condition 5 and condition 9, the following provisions set out the entire financial liability of ITC (including any liability for the acts or omissions of its employees, agents and sub-contractors) to the Buyer in respect of:

10.1.1. any breach of these conditions;

10.1.2. any use made or resale by the Buyer of any of the Goods, or of any product incorporating any of the Goods; and

10.1.3. any representation, statement or tortious act or omission including negligence arising under or in connection with the Contract.

10.2. All warranties, conditions and other terms implied by statute or common law (save for the conditions implied by section 12 of the Sale of Goods Act 1979) are, to the fullest extent permitted by law, excluded from the Contract.

10.3. Nothing in these conditions excludes or limits the liability of ITC:

10.3.1. for death or personal injury caused by ITC's negligence; or

10.3.2. under section 2(3), Consumer Protection Act 1987; or

10.3.3. for any matter which it would be illegal for ITC to exclude or attempt to exclude its liability; or

10.3.4. for fraud or fraudulent misrepresentation.

10.4. Subject to condition 10.2 and condition 10.3:

10.4.1. ITC's total liability in contract, tort (including negligence or breach of statutory duty), misrepresentation, restitution or otherwise, arising in connection with the performance or contemplated performance of the Contract shall be limited to the Contract price; and

10.4.2. ITC shall not be liable to the Buyer for loss of profit, loss of business, or depletion of goodwill in each case whether direct, indirect or consequential, or any claims for consequential compensation whatsoever (howsoever caused) which arise out of or in connection with the Contract.

11. Export terms

11.1. Unless the context otherwise requires, any term or expression which is defined in or given a particular meaning by the provisions of INCOTERMS shall have the same meaning in these Conditions, but if there is any conflict between the provisions of INCOTERMS and these Conditions, the latter shall prevail.

11.2. Where the Goods are supplied for export from the United Kingdom, the provisions of these clause 11 shall (subject to any special terms agreed in writing between the Buyer and ITC) apply notwithstanding any other provision of these Conditions.

11.3. The Buyer shall be responsible for complying with any legislation or regulations governing the importation of the Goods into the country of destination and for the payment of any duties on them.

11.4. Unless otherwise agreed in writing between the Buyer and ITC, the Goods shall be delivered [job the air or sea port of shipment] and the Seller shall be under no obligation to give notice under section 32(3) of the Sale of Goods Act 1979.

11.5. The Buyer shall be responsible for arranging for testing and inspection of the Goods at ITC's premises before shipment. ITC shall have no liability for any claim in respect of any defect in the Goods which would be apparent on inspection and which is made after shipment, or in respect of any damage during transit.

11.6. Unless otherwise required by ITC, payment of all amounts due to the Seller shall be made by an irrevocable letter of credit, in a form acceptable to ITC, to be opened by the Buyer in favour of ITC and confirmed by a bank in the United Kingdom acceptable to ITC within 14 days after the Contract is concluded.

11.7. The Buyer shall not offer the Goods for resale in _____ or any other country notified by ITC to the Buyer at or before the time the Buyer's order is placed, or sell the Goods to any person if the Buyer knows or has reason to believe that that person intends to resell the Goods in any such country.

12. Assignment

12.1. ITC may assign the Contract or any part of it to any person, firm or company.

12.2. The Buyer shall not be entitled to assign the Contract or any part of it without the prior written consent of ITC.

13. Force majeure

13.1. ITC reserves the right to defer the date of delivery or performance or to cancel the Contract or reduce the volume of the Goods ordered by the Buyer (without liability to the Buyer) if it is prevented from or delayed in the carrying on of its business due to circumstances beyond the reasonable control of ITC, including, without limitation, acts of God, governmental actions, war or national emergency, acts of terrorism, protests, riot, civil commotion, fire, explosion, flood, epidemic, lock-outs, strikes or other labour disputes (whether or not relating to either party's workforce), or restraints or delays affecting carriers or inability or delay in obtaining supplies of adequate or suitable materials, provided that, if the event in question continues for a continuous period in excess of 90 days, the Buyer shall be entitled to give notice in writing to ITC to terminate the Contract.

14. General

14.1. Each right or remedy of ITC under the Contract is without prejudice to any other right or remedy of ITC whether under the Contract or not.

14.2. If any provision of the Contract is found by any court, tribunal or administrative body of competent jurisdiction to be wholly or partly illegal, invalid, void, voidable, unenforceable or unreasonable it shall to the extent of such illegality, invalidity, voidness, voidability, unenforceability or unreasonableness be deemed severable and the remaining provisions of the Contract and the remainder of such provision shall continue in full force and effect.

14.3. Failure or delay by ITC in enforcing or partially enforcing any provision of the Contract shall not be construed as a waiver of any of its rights under the Contract.

14.4. Any waiver by ITC of any breach of, or any default under, any provision of the Contract by the Buyer shall not be deemed a waiver of any subsequent breach or default and shall in no way affect the other terms of the Contract.

14.5. The parties to the Contract do not intend that any term of the Contract shall be enforceable by virtue of the Contracts (Rights of Third Parties) Act 1999 by any person that is not a party to it.

14.6. The formation, existence, construction, performance, validity and all aspects of the Contract shall be governed by English law and the parties submit to the exclusive jurisdiction of the English courts.

15. Communications

15.1. All notices between the parties relating to the Contract shall be in writing and delivered by hand or sent by pre-paid first class post or sent by fax:

15.1.1. in the case of notices to ITC to its registered office or such changed address as shall be notified to the Buyer by ITC; or

15.1.2. (in the case of notices to the Buyer) to the registered office of the addressee (if it is a company) or (in any other case) to any address of the Buyer set out in any document which forms part of the Contract or such other address as shall be notified to ITC by the Buyer.

15.2. Notices shall be deemed to have been received:

15.2.1. if sent by pre-paid first class post, two days (excluding Saturdays, Sundays and bank and public holidays) after posting (exclusive of the day of posting); or

15.2.2. if delivered by hand, on the day of delivery; or

15.2.3. if sent by fax on a working day prior to 4.00 pm, at the time of transmission and otherwise on the next working day.

15.3. Notices addressed to ITC shall be marked for the attention of Mr P Graves.

16. Indemnity

16.1. Where any claim is made against the Buyer that the Goods or Services provided infringe or that their use or resale infringes the patent, copyright, design, trade mark or other industrial or intellectual property rights of any other person, then, unless the claim arises from the use of any drawing, design or specification supplied by the Buyer, ITC shall indemnify the Buyer against all loss, damages, costs and expenses awarded against or incurred by the Buyer in connection with the claim, or paid or agreed to be paid by the Buyer in settlement of the claim, provided that:

16.1.1. the Buyer shall immediately inform ITC of all such claims;

16.1.2. ITC is given full control of any proceedings or negotiations in connection with any such claim;

16.1.3. the Buyer shall give ITC all reasonable assistance for the purposes of any such proceedings or negotiations;

16.1.4. except pursuant to a final award, the Buyer shall not pay or accept any such claim, or compromise any such proceedings without the consent of ITC (which shall not be unreasonably withheld);

16.1.5. the Buyer shall do nothing which would or might vitiate any policy of insurance or insurance cover which the Buyer may have in relation to such infringement, and this indemnity shall not apply to the extent that the Buyer recovers any sums under any such policy or cover (which the Buyer shall use in its best endeavours to do);

16.1.6. ITC shall be entitled to the benefit of, and the Buyer shall accordingly account to ITC for, all damages and costs (if any) awarded in favour of the Buyer which are payable by, or agreed with the consent of the Buyer (which consent shall not be unreasonably withheld) to be paid by, any other party in respect of any such claim; and

16.1.7. without prejudice to any duty of the Buyer at common law, ITC shall be entitled to require the Buyer to take such steps as ITC may reasonably require to mitigate or reduce any such loss, damages, costs or expenses for which ITC is liable to indemnify the Buyer under this clause.

17. Insolvency of Buyer

17.1. This clause applies if:

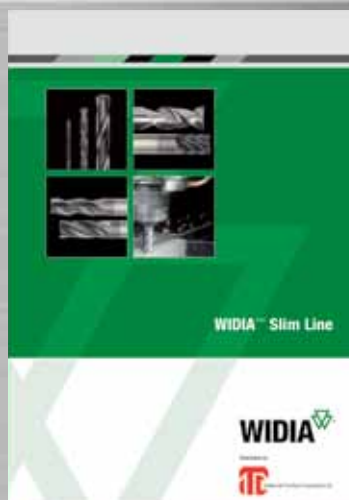
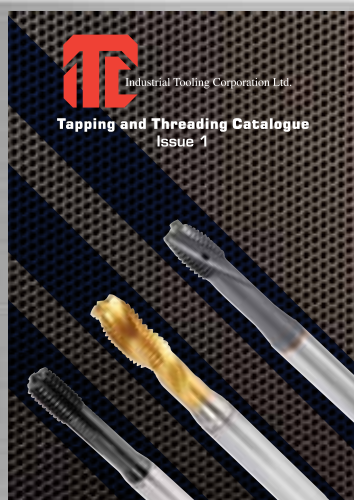
17.1.1. the Buyer makes any voluntary arrangement with its creditors or (being an individual or firm) becomes bankrupt or (being a company) becomes subject to an administration order or goes into liquidation (otherwise than for the purposes of amalgamation or reconstruction); or

17.1.2. an encumbrancer takes possession, or a receiver is appointed, of any of the property or assets of the Buyer; or

17.1.3. the Buyer ceases, or threatens to cease, to carry on business; or

17.1.4. ITC reasonably apprehends that any of the events mentioned above is about to occur in relation to the Buyer and notifies the Buyer accordingly.

17.2. If this clause applies then, without prejudice to any other right or remedy available to ITC, ITC shall be entitled to cancel the Contract or suspend any further deliveries or performance of the Services under the Contract without any liability to the Buyer, and if the Goods have been delivered but not paid for the Price and the Ancillary Costs shall become immediately due and payable notwithstanding any previous agreement or arrangement to the contrary.



Intelligent, Technical, Cutting solutions

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