HYPROCARB SERIES PAT.P.
PRODUCT INFORMATION

OSG UK Ltd.

HY-PRO

(MG) Micro Grain Carbide Tool Series

• Drills • End Mills

HY-PRO

the new tooling range from OSG

March 2013

TOOL ICON GUIDE

1 Tool material

CARBIDE — Tungsten carbide

2 Surface treatment

TiAlN — Titanium aluminium nitride coating

DIA — Diamond coating

4 Helix angle

45° — Displays flute helix angle

3 Tolerance for drill diameter

h8 — Drill diameter tolerance

5 Drill point angle

Point angle

6 Shank

SHRINK FIT — Suitable for Shrink Fit system

h6 — Shank diameter tolerance

Flated shank

9 Milling examples

Suitable for contouring

Slotting square end

Slotting ball end

Profiling

Profiling

Side milling

Side milling

Side milling ball end

9 Miscellaneous

CC — Centre cutting

RF — Suitable for roughing and finishing

HIGH SPEED — High speed milling

Through coolant

Tolerance ball nose end mills

min⁻¹ — Milling conditions

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DRILLING CONTENTS

	DESCRIPTION		DRILLING DEPTH						
	NAME	SPECIFICATION	Page	Range	≤2D	≤3D	≤4D	≤5D	≤8D
UNCOATED									
	HC-H-DRL	Stub uncoated, general applications	24	1~12	✔	✔	✔		
TiALN COATED									
	HYP-HP-3D	Stub, general applications	12	3~20	✔	✔			
	HYP-HP-5D	Regular, for general applications	14	3~20	✔	✔	✔	✔	
TiALN COATED THROUGH COOLANT									
	HYP-HPO-3D	Stub, through coolant	16	3~20	✔	✔	✔		
	HYP-HPO-5D	Regular, through coolant	18	3~20	✔	✔	✔	✔	
	HYP-HPO-8D	Long, through coolant	20	3~20			✔	✔	✔
SPOT DRILL									
	HYP-LDS	2 flute, 90^0, 120^0 & 142^0	22	3~8					

WORK MATERIAL

◎ Excellent ○ Good

	Low carbon steel	Medium carbon steel	High carbon steel	Alloy steel	Hardened steel		Quenched and tempered steel			Stainless steel	Tool steel	Cast Iron	Ductile cast Iron	Copper	Aluminium	Aluminium alloy casting	Titanium	Titanium alloy	INCONEL®	Composite material	Magnesium alloy
				SCM	< 35 HRC	35~45 HRC	45~50 HRC	50~62 HRC	62~70 HRC	SUS	SKD SKS	GG	GGG	Cu	Al	AC	Ti			CFRP	
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CARBIDE MILLING CONTENTS

WORK MATERIAL

◎ Excellent ○ Good

	Carbon steel	Alloy Steel	Tool steel	Hardened and Pre hardened steels					Stainless steel	Cast Iron	Ductile Cast Iron	Copper alloy	Aluminium alloy	Graphite	Titanium alloy	Heat resistant alloy	Plastic
	~40HRC	~40HRC	~40HRC	~40HRC	~45HRC	~55HRC	~60HRC	~65HRC	SUS ~35HRC	GG ~350 HB	GGG ~350 HB						
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CARBIDE MILLING CONTENTS

WORK MATERIAL

◎ Excellent ○ Good

	Carbon steel	Alloy Steel	Tool steel	Hardened and Pre hardened steels					Stainless steel	Cast Iron	Ductile Cast Iron	Copper alloy	Aluminium alloy	Graphite	Titanium alloy	Heat resistant alloy	Plastic
	~40HRC	~40HRC	~40HRC	~40HRC	~45HRC	~55HRC	~60HRC	~65HRC	SUS ~35HRC	GG ~350 HB	GGG ~350 HB						
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CARBIDE MILLING CONTENTS

WORK MATERIAL

◎ Excellent ○ Good

	Carbon steel	Alloy Steel	Tool steel	Hardened and Pre hardened steels					Stainless steel	Cast Iron	Ductile Cast Iron	Copper alloy	Aluminium alloy	Graphite	Titanium alloy	Heat resistant alloy	Plastic
	~40HRC	~40HRC	~40HRC	~40HRC	~45HRC	~55HRC	~60HRC	~65HRC	SUS ~35HRC	GG ~350 HB	GGG ~350 HB						
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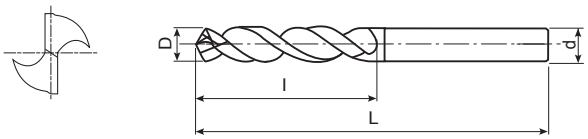
HYP-HP-3D

COATED CARBIDE DRILL DRILLING 3XD

- OSG Standard, 2 flutes, for general applications
- Material : MG (micro grain carbide)
- Surface treatment : TiALN

Icon key page 2



HYP-HP-3D					
EDP	D	L	l	d	Price
30200300	3,0	62	20	6	£23.50
30200310	3,1	62	20	6	£23.50
30200317	3,17 (1/8)	62	20	6	£23.50
30200320	3,2	62	20	6	£23.50
30200330	3,3	62	20	6	£23.50
30200340	3,4	62	20	6	£23.50
30200350	3,5	62	20	6	£23.50
30200357	3,57 (9/64)	62	20	6	£23.50
30200360	3,6	62	20	6	£23.50
30200370	3,7	62	20	6	£23.50
30200380	3,8	66	24	6	£23.50
30200390	3,9	66	24	6	£23.50
30200397	3,97 (5/32)	66	24	6	£23.50
30200400	4,0	66	24	6	£23.50
30200410	4,1	66	24	6	£23.50
30200420	4,2	66	24	6	£23.50
30200430	4,3	66	24	6	£23.50
30200437	4,37 (11/64)	66	24	6	£23.50
30200440	4,4	66	24	6	£23.50
30200450	4,5	66	24	6	£23.50
30200455	4,55	66	24	6	£23.50
30200460	4,6	66	24	6	£23.50
30200470	4,7	66	24	6	£23.50
30200476	4,76 (3/16)	66	24	6	£23.50
30200480	4,8	66	28	6	£23.50
30200490	4,9	66	28	6	£23.50
30200500	5,0	66	28	6	£23.50
30200510	5,1	66	28	6	£23.50
30200516	5,16 (13/64)	66	28	6	£23.50
30200520	5,2	66	28	6	£23.50
30200530	5,3	66	28	6	£23.50
30200540	5,4	66	28	6	£23.50
30200550	5,5	66	28	6	£23.50
30200556	5,56 (7/32)	66	28	6	£23.50
30200560	5,6	66	28	6	£23.50
30200570	5,7	66	28	6	£23.50
30200580	5,8	66	28	6	£23.50
30200590	5,9	66	28	6	£23.50
30200595	5,95 (15/64)	66	28	6	£23.50
30200600	6,0	66	28	6	£23.50
30200610	6,1	79	34	8	£23.70

HYP-HP-3D					
EDP	D	L	l	d	Price
30200620	6,2	79	34	8	£23.70
30200630	6,3	79	34	8	£23.70
30200635	6,35 (1/4)	79	34	8	£23.70
30200640	6,4	79	34	8	£23.70
30200650	6,5	79	34	8	£23.70
30200660	6,6	79	34	8	£23.70
30200670	6,7	79	34	8	£23.70
30200675	6,75 (17/64)	79	34	8	£23.70
30200680	6,8	79	34	8	£23.70
30200690	6,9	79	34	8	£23.70
30200700	7,0	79	34	8	£23.70
30200710	7,1	79	34	8	£23.70
30200714	7,14 (9/32)	79	41	8	£23.70
30200720	7,2	79	41	8	£23.70
30200730	7,3	79	41	8	£23.70
30200740	7,4	79	41	8	£23.70
30200750	7,5	79	41	8	£23.70
30200754	7,54 (19/64)	79	41	8	£23.70
30200760	7,6	79	41	8	£23.70
30200770	7,7	79	41	8	£23.70
30200780	7,8	79	41	8	£23.70
30200790	7,9	79	41	8	£23.70
30200794	7,94 (5/16)	79	41	8	£23.70
30200800	8,0	79	41	8	£23.70
30200810	8,1	79	41	10	£32.00
30200820	8,2	79	41	10	£32.00
30200830	8,3	79	41	10	£32.00
30200833	8,33 (21/64)	89	47	10	£32.00
30200840	8,4	89	47	10	£32.00
30200850	8,5	89	47	10	£31.50
30200860	8,6	89	47	10	£32.00
30200870	8,7	89	47	10	£32.00
30200873	8,73 (11/32)	89	47	10	£32.00
30200880	8,8	89	47	10	£32.00
30200890	8,9	89	47	10	£32.00
30200900	9,0	89	47	10	£32.00
30200910	9,1	89	47	10	£32.00
30200913	9,13 (23/64)	89	47	10	£32.00
30200920	9,2	89	47	10	£32.00
30200930	9,3	89	47	10	£32.00
30200940	9,4	89	47	10	£32.00

HYP-HP-3D

COATED CARBIDE DRILL DRILLING 3XD

HYP-HP-3D					
EDP	D	L	l	d	Price
30200950	9,5	89	47	10	£32.00
30200952	9,52 (3/8)	89	47	10	£32.00
30200960	9,6	89	47	10	£32.00
30200970	9,7	89	47	10	£32.00
30200980	9,8	89	47	10	£32.00
30200990	9,9	89	47	10	£32.00
30200992	9,92 (25/64)	89	47	10	£32.00
30201000	10,0	89	47	10	£32.00
30201010	10,1	89	47	12	£41.50
30201020	10,2	102	55	12	£41.50
30201030	10,3	102	55	12	£41.50
30201032	10,32 (13/32)	102	55	12	£41.50
30201040	10,4	102	55	12	£41.50
30201050	10,5	102	55	12	£41.50
30201060	10,6	102	55	12	£41.50
30201070	10,7	102	55	12	£41.50
30201072	10,72 (27/64)	102	55	12	£41.50
30201080	10,8	102	55	12	£41.50
30201090	10,9	102	55	12	£41.50
30201100	11,0	102	55	12	£41.50
30201110	11,1	102	55	12	£41.50
30201111	11,11 (7/16)	102	55	12	£41.50
30201120	11,2	102	55	12	£41.50
30201130	11,3	102	55	12	£41.50
30201140	11,4	102	55	12	£41.50
30201150	11,5	102	55	12	£41.50
30201151	11,51 (29/64)	102	55	12	£41.50

HYP-HP-3D					
EDP	D	L	l	d	Price
30201160	11,6	102	55	12	£41.50
30201170	11,7	102	55	12	£41.50
30201180	11,8	102	55	12	£41.50
30201190	11,9	102	55	12	£41.50
30201191	11,91 (15/32)	102	55	12	£41.50
30201200	12,0	102	55	12	£41.50
30201230	12,30 (31/64)	107	60	14	£59.75
30201250	12,5	107	60	14	£59.75
30201270	12,70 (1/2)	107	60	14	£59.75
30201300	13,0	107	60	14	£59.75
30201350	13,5	107	60	14	£59.75
30201400	14,0	107	60	14	£59.75
30201429	14,29 (9/16)	115	65	16	£78.25
30201450	14,5	115	65	16	£78.25
30201500	15,0	115	65	16	£78.25
30201550	15,5	115	65	16	£78.25
30201587	15,87 (5/8)	115	65	16	£78.25
30201600	16,0	115	65	16	£78.25
30201650	16,5	123	73	18	£148.25
30201700	17,0	123	73	18	£148.25
30201750	17,5	123	73	18	£148.25
30201800	18,0	123	73	18	£148.25
30201850	18,5	131	79	20	£161.50
30201900	19,0	131	79	20	£161.50
30201950	19,5	131	79	20	£161.50
30202000	20,0	131	79	20	£161.50

◎ EXCELLENT ○ GOOD

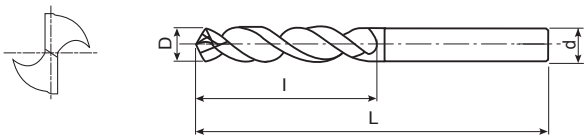
Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	◎	◎	◎	◎	○			○	○		◎	◎
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Vinyl	CFRP
								○	○			

HYP-HP-5D

COATED CARBIDE DRILL DRILLING 5XD

- OSG Standard, 2 flutes, for general applications
- Material : MG (micro grain carbide)
- Surface treatment : TiALN

Icon key page 2



HYP-HP-5D					
EDP	D	L	l	d	Price
31200300	3,0	66	28	6	£27.27
31200310	3,1	66	28	6	£27.27
31200317	3,17 (1/8)	66	28	6	£27.27
31200320	3,2	66	28	6	£27.27
31200330	3,3	66	28	6	£27.27
31200340	3,4	66	28	6	£27.27
31200350	3,5	66	28	6	£27.27
31200357	3,57 (9/64)	66	28	6	£27.27
31200360	3,6	66	28	6	£27.27
31200370	3,7	66	28	6	£27.27
31200380	3,8	74	36	6	£27.27
31200390	3,9	74	36	6	£27.27
31200397	3,97 (5/32)	74	36	6	£27.27
31200400	4,0	74	36	6	£27.27
31200410	4,1	74	36	6	£27.27
31200420	4,2	74	36	6	£27.27
31200430	4,3	74	36	6	£27.27
31200437	4,37 (11/64)	74	36	6	£27.27
31200440	4,4	74	36	6	£27.27
31200450	4,5	74	36	6	£27.27
31200460	4,6	74	36	6	£27.27
31200470	4,7	82	44	6	£27.27
31200476	4,76 (3/16)	82	44	6	£27.27
31200480	4,8	82	44	6	£27.27
31200490	4,9	82	44	6	£27.27
31200500	5,0	82	44	6	£27.27
31200510	5,1	82	44	6	£27.27
31200516	5,16 (13/64)	82	44	6	£27.27
31200520	5,2	82	44	6	£27.27
31200530	5,3	82	44	6	£27.27
31200540	5,4	82	44	6	£27.27
31200550	5,5	82	44	6	£27.27
31200556	5,56 (7/32)	82	44	6	£27.27
31200560	5,6	82	44	6	£27.27
31200570	5,7	82	44	6	£27.27
31200580	5,8	82	44	6	£27.27
31200590	5,9	82	44	6	£27.27
31200595	5,95 (15/64)	82	44	6	£27.27
31200600	6,0	82	44	6	£27.27
31200610	6,1	91	53	8	£29.50
31200620	6,2	91	53	8	£29.50

HYP-HP-5D					
EDP	D	L	l	d	Price
31200630	6,3	91	53	8	£29.50
31200635	6,35 (1/4)	91	53	8	£29.50
31200640	6,4	91	53	8	£29.50
31200650	6,5	91	53	8	£29.50
31200660	6,6	91	53	8	£29.50
31200670	6,7	91	53	8	£29.50
31200675	6,75 (17/64)	91	53	8	£29.50
31200680	6,8	91	53	8	£29.50
31200690	6,9	91	53	8	£29.50
31200700	7,0	91	53	8	£29.50
31200710	7,1	91	53	8	£29.50
31200714	7,14 (9/32)	91	53	8	£29.50
31200720	7,2	91	53	8	£29.50
31200730	7,3	91	53	8	£29.50
31200740	7,4	91	53	8	£29.50
31200750	7,5	91	53	8	£29.50
31200754	7,54 (19/64)	91	53	8	£29.50
31200760	7,6	91	53	8	£29.50
31200770	7,7	91	53	8	£29.50
31200780	7,8	91	53	8	£29.50
31200790	7,9	91	53	8	£29.50
31200794	7,94 (5/16)	91	53	8	£29.50
31200800	8,0	91	53	8	£29.50
31200810	8,1	103	61	8	£37.26
31200820	8,2	103	61	10	£37.26
31200830	8,3	103	61	10	£37.26
31200833	8,33 (21/64)	103	61	10	£37.26
31200840	8,4	103	61	10	£37.26
31200850	8,5	103	61	10	£37.26
31200860	8,6	103	61	10	£37.26
31200870	8,7	103	61	10	£37.26
31200873	8,73 (11/32)	103	61	10	£37.26
31200880	8,8	103	61	10	£37.26
31200890	8,9	103	61	10	£37.26
31200900	9,0	103	61	10	£37.26
31200910	9,1	103	61	10	£37.26
31200913	9,13 (23/64)	103	61	10	£37.26
31200920	9,2	103	61	10	£37.26
31200930	9,3	103	61	10	£37.26
31200940	9,4	103	61	10	£37.26
31200950	9,5	103	61	10	£37.26

HYP-HP-5D

COATED CARBIDE DRILL DRILLING 5XD

HYP-HP-5D					
EDP	D	L	l	d	Price
31200952	9,52 (3/8)	103	61	10	£37.26
31200960	9,6	103	61	10	£37.26
31200970	9,7	103	61	10	£37.26
31200980	9,8	103	61	10	£37.26
31200990	9,9	103	61	10	£37.26
31200992	9,92 (25/64)	103	61	10	£37.26
31201000	10,0	103	61	10	£36.50
31201010	10,1	118	71	12	£59.75
31201020	10,2	118	71	12	£59.75
31201030	10,3	118	71	12	£59.75
31201032	10,32 (13/32)	118	71	12	£59.75
31201040	10,4	118	71	12	£59.75
31201050	10,5	118	71	12	£59.75
31201060	10,6	118	71	12	£59.75
31201070	10,7	118	71	12	£59.75
31201072	10,72 (27/64)	118	71	12	£59.75
31201080	10,8	118	71	12	£59.75
31201090	10,9	118	71	12	£59.75
31201100	11,0	118	71	12	£59.75
31201110	11,1	118	71	12	£59.75
31201111	11,11 (7/16)	118	71	12	£59.75
31201120	11,2	118	71	12	£59.75
31201130	11,3	118	71	12	£59.75
31201140	11,4	118	71	12	£59.75
31201150	11,5	118	71	12	£59.75
31201151	11,51 (29/64)	118	71	12	£59.75

HYP-HP-5D					
EDP	D	L	l	d	Price
31201160	11,6	118	71	12	£59.75
31201170	11,7	118	71	12	£59.75
31201180	11,8	118	71	12	£59.75
31201190	11,9	118	71	12	£59.75
31201191	11,91 (15/32)	118	71	12	£59.75
31201200	12,0	118	71	12	£59.75
31201230	12,3 (31/64)	124	77	14	£69.86
31201250	12,5	124	77	14	£69.86
31201270	12,7 (1/2)	124	77	14	£69.86
31201300	13,0	124	77	14	£69.86
31201350	13,5	124	77	14	£69.86
31201400	14,0	124	77	14	£69.86
31201429	14,29 (9/16)	133	83	16	£98.33
31201450	14,5	133	83	16	£98.33
31201500	15,0	133	83	16	£98.33
31201550	15,5	133	83	16	£98.33
31201587	15,87 (5/8)	133	83	16	£98.33
31201600	16,0	133	93	18	£98.33
31201650	16,5	143	93	18	£157.32
31201700	17,0	143	93	18	£157.32
31201750	17,5	143	93	18	£157.32
31201800	18,0	143	93	18	£157.32
31201850	18,5	153	101	20	£174.92
31201900	19,0	153	101	20	£174.92
31201950	19,5	153	101	20	£174.92
31202000	20,0	153	101	20	£174.92

◎ EXCELLENT ○ GOOD

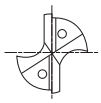
Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	◎	◎	◎	◎	○			○	○		◎	◎
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Vinyl	CFRP
								○	○			

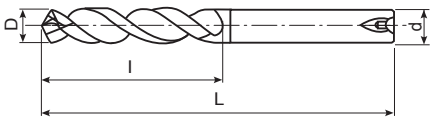
HYP-HPO-3D

COATED CARBIDE DRILL WITH OIL HOLE DRILLING 3XD

- OSG Standard, 2 Flutes, for general applications
- Material : MG (micro grain carbide)
- Surface treatment : TiALN

Icon key page 2





HYP-HPO-3D					
EDP	D	L	l	d	Price
30210300	3,0	62	20	6	£30.00
30210310	3,1	62	20	6	£30.00
30210317	3,17 (1/8)	62	20	6	£30.00
30210320	3,2	62	20	6	£30.00
30210330	3,3	62	20	6	£30.00
30210340	3,4	62	20	6	£30.00
30210350	3,5	62	20	6	£30.00
30210357	3,57 (9/64)	62	20	6	£30.00
30210360	3,6	62	20	6	£30.00
30210370	3,7	62	20	6	£30.00
30210380	3,8	66	24	6	£30.00
30210390	3,9	66	24	6	£30.00
30210397	3,97 (5/32)	66	24	6	£30.00
30210400	4,0	66	24	6	£30.00
30210410	4,1	66	24	6	£30.00
30210420	4,2	66	24	6	£30.00
30210430	4,3	66	24	6	£30.00
30210437	4,37 (11/64)	66	24	6	£30.00
30210440	4,4	66	24	6	£30.00
30210450	4,5	66	24	6	£30.00
30210460	4,6	66	24	6	£30.00
30210470	4,7	66	24	6	£30.00
30210476	4,76 (3/16)	66	24	6	£30.00
30210480	4,8	66	28	6	£30.00
30210490	4,9	66	28	6	£30.00
30210500	5,0	66	28	6	£32.25
30210510	5,1	66	28	6	£32.25
30210516	5,16 (13/64)	66	28	6	£32.25
30210520	5,2	66	28	6	£32.25
30210530	5,3	66	28	6	£32.25
30210540	5,4	66	28	6	£32.25
30210550	5,5	66	28	6	£32.25
30210556	5,56 (7/32)	66	28	6	£32.25
30210560	5,6	66	28	6	£32.25
30210570	5,7	66	28	6	£32.25
30210580	5,8	66	28	6	£32.25
30210590	5,9	66	28	6	£32.25
30210595	5,95 (15/64)	66	28	6	£32.25
30210600	6,0	66	28	6	£32.25
30210610	6,1	79	34	8	£43.85
30210620	6,2	79	34	8	£43.85

HYP-HPO-3D					
EDP	D	L	l	d	Price
30210630	6,3	79	34	8	£43.85
30210635	6,35 (1/4)	79	34	8	£43.85
30210640	6,4	79	34	8	£43.85
30210650	6,5	79	34	8	£43.85
30210660	6,6	79	34	8	£43.85
30210670	6,7	79	34	8	£43.85
30210675	6,75 (17/64)	79	34	8	£43.85
30210680	6,8	79	34	8	£43.85
30210690	6,9	79	34	8	£43.85
30210700	7,0	79	34	8	£43.85
30210710	7,1	79	34	8	£43.85
30210714	7,14 (9/32)	79	41	8	£43.85
30210720	7,2	79	41	8	£43.85
30210730	7,3	79	41	8	£43.85
30210740	7,4	79	41	8	£43.85
30210750	7,5	79	41	8	£43.85
30210754	7,54 (19/64)	79	41	8	£43.85
30210760	7,6	79	41	8	£43.85
30210770	7,7	79	41	8	£43.85
30210780	7,8	79	41	8	£43.85
30210790	7,9	79	41	8	£43.85
30210794	7,94 (5/16)	79	41	8	£43.85
30210800	8,0	79	41	8	£43.85
30210810	8,1	79	41	10	£49.35
30210820	8,2	79	41	10	£49.35
30210830	8,3	79	41	10	£49.35
30210833	8,33 (21/64)	89	47	10	£49.35
30210840	8,4	89	47	10	£49.35
30210850	8,5	89	47	10	£49.35
30210860	8,6	89	47	10	£49.35
30210870	8,7	89	47	10	£49.35
30210873	8,73 (11/32)	89	47	10	£49.35
30210880	8,8	89	47	10	£49.35
30210890	8,9	89	47	10	£49.35
30210900	9,0	89	47	10	£49.35
30210910	9,1	89	47	10	£49.35
30210913	9,13 (23/64)	89	47	10	£49.35
30210920	9,2	89	47	10	£49.35
30210930	9,3	89	47	10	£49.35
30210940	9,4	89	47	10	£49.35
30210950	9,5	89	47	10	£49.35

HYP-HPO-3D

COATED CARBIDE DRILL WITH OIL HOLE DRILLING 3XD

HYP-HPO-3D					
EDP	D	L	l	d	Price
30210952	9,52 (3/8)	89	47	10	£49.35
30210960	9,6	89	47	10	£49.35
30210970	9,7	89	47	10	£49.35
30210980	9,8	89	47	10	£49.35
30210990	9,9	89	47	10	£49.35
30210992	9,92 (25/64)	89	47	10	£49.35
30211000	10,0	89	47	10	£49.35
30211010	10,1	89	47	12	£72.00
30211020	10,2	102	55	12	£72.00
30211030	10,3	102	55	12	£72.00
30211032	10,32 (13/32)	102	55	12	£72.00
30211040	10,4	102	55	12	£72.00
30211050	10,5	102	55	12	£72.00
30211060	10,6	102	55	12	£72.00
30211070	10,7	102	55	12	£72.00
30211072	10,72 (27/64)	102	55	12	£72.00
30211080	10,8	102	55	12	£72.00
30211090	10,9	102	55	12	£72.00
30211100	11,0	102	55	12	£72.00
30211110	11,1	102	55	12	£72.00
30211111	11,11 (7/16)	102	55	12	£72.00
30211120	11,2	102	55	12	£72.00
30211130	11,3	102	55	12	£72.00
30211140	11,4	102	55	12	£72.00
30211150	11,5	102	55	12	£72.00
30211151	11,51 (29/64)	102	55	12	£72.00

HYP-HPO-3D					
EDP	D	L	l	d	Price
30211160	11,6	102	55	12	£72.00
30211170	11,7	102	55	12	£72.00
30211180	11,8	102	55	12	£72.00
30211190	11,9	102	55	12	£72.00
30211191	11,91 (15/32)	102	55	12	£72.00
30211200	12,0	102	55	12	£72.00
30211230	12,30 (31/64)	107	60	14	£98.50
30211250	12,5	107	60	14	£98.50
30211270	12,70 (1/2)	107	60	14	£98.50
30211300	13,0	107	60	14	£98.50
30211350	13,5	107	60	14	£98.50
30211400	14,0	107	60	14	£98.50
30211429	14,29 (9/16)	115	65	16	£121.35
30211450	14,5	115	65	16	£121.35
30211500	15,0	115	65	16	£121.35
30211550	15,5	115	65	16	£121.35
30211587	15,87 (5/8)	115	65	16	£121.35
30211600	16,0	115	65	16	£121.35
30211650	16,5	123	73	18	£194.58
30211700	17,0	123	73	18	£194.58
30211750	17,5	123	73	18	£194.58
30211800	18,0	123	73	18	£194.58
30211850	18,5	131	79	20	£213.21
30211900	19,0	131	79	20	£213.21
30211950	19,5	131	79	20	£213.21
30212000	20,0	131	79	20	£213.21

◎ EXCELLENT ○ GOOD

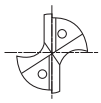
Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	◎	◎	◎	◎	○			○	○		◎	◎
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Vinyl	CFRP
								○	○			

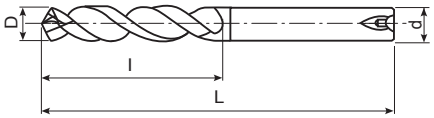
HYP-HPO-5D

COATED CARBIDE DRILL WITH OIL HOLE DRILLING 5XD

- OSG Standard, 2 flutes, for general applications
- Material : MG (micro grain carbide)
- Surface treatment : TiALN

Icon key page 2





HYP-HPO-5D					
EDP	D	L	l	d	Price
30220300	3,0	66	28	6	£39.26
30220310	3,1	66	28	6	£39.26
30220317	3,17 (1/8)	66	28	6	£39.26
30220320	3,2	66	28	6	£39.26
30220330	3,3	66	28	6	£39.26
30220340	3,4	66	28	6	£39.26
30220350	3,5	66	28	6	£39.26
30220357	3,57 (9/64)	66	28	6	£39.26
30220360	3,6	66	28	6	£39.26
30220370	3,7	66	28	6	£39.26
30220380	3,8	74	36	6	£39.26
30220390	3,9	74	36	6	£39.26
30220397	3,97 (5/32)	74	36	6	£39.26
30220400	4,0	74	36	6	£41.25
30220410	4,1	74	36	6	£41.25
30220420	4,2	74	36	6	£41.25
30220430	4,3	74	36	6	£41.25
30220437	4,37 (11/64)	74	36	6	£41.25
30220440	4,4	74	36	6	£41.25
30220450	4,5	74	36	6	£41.25
30220460	4,6	74	36	6	£41.25
30220465	4,65	74	36	6	£41.25
30220470	4,7	82	44	6	£41.25
30220476	4,76 (3/16)	82	44	6	£41.25
30220480	4,8	82	44	6	£41.25
30220490	4,9	82	44	6	£41.25
30220500	5,0	82	44	6	£41.25
30220510	5,1	82	44	6	£41.25
30220516	5,16 (13/64)	82	44	6	£41.25
30220520	5,2	82	44	6	£41.25
30220530	5,3	82	44	6	£41.25
30220540	5,4	82	44	6	£41.25
30220550	5,5	82	44	6	£41.25
30220555	5,55	82	44	6	£41.25
30220556	5,56 (7/32)	82	44	6	£41.25
30220560	5,6	82	44	6	£41.25
30220570	5,7	82	44	6	£41.25
30220580	5,8	82	44	6	£41.25
30220590	5,9	82	44	6	£41.25
30220595	5,95 (15/64)	82	44	6	£41.25
30220600	6,0	82	44	6	£41.25

HYP-HPO-5D					
EDP	D	L	l	d	Price
30220610	6,1	91	53	8	£45.95
30220620	6,2	91	53	8	£45.95
30220630	6,3	91	53	8	£45.95
30220635	6,35 (1/4)	91	53	8	£45.95
30220640	6,4	91	53	8	£45.95
30220650	6,5	91	53	8	£45.95
30220660	6,6	91	53	8	£45.95
30220670	6,7	91	53	8	£45.95
30220675	6,75 (17/64)	91	53	8	£45.95
30220680	6,8	91	53	8	£45.95
30220690	6,9	91	53	8	£45.95
30220700	7,0	91	53	8	£45.95
30220710	7,1	91	53	8	£45.95
30220714	7,14 (9/32)	91	53	8	£45.95
30220720	7,2	91	53	8	£45.95
30220730	7,3	91	53	8	£45.95
30220740	7,4	91	53	8	£45.95
30220750	7,5	91	53	8	£45.95
30220754	7,54 (19/64)	91	53	8	£45.95
30220760	7,6	91	53	8	£45.95
30220770	7,7	91	53	8	£45.95
30220780	7,8	91	53	8	£45.95
30220790	7,9	91	53	8	£45.95
30220794	7,94 (5/16)	91	53	8	£45.95
30220800	8,0	91	53	8	£45.95
30220810	8,1	103	61	8	£52.99
30220820	8,2	103	61	10	£52.99
30220830	8,3	103	61	10	£52.99
30220833	8,33 (21/64)	103	61	10	£52.99
30220840	8,4	103	61	10	£52.99
30220850	8,5	103	61	10	£52.99
30220860	8,6	103	61	10	£52.99
30220870	8,7	103	61	10	£52.99
30220873	8,73 (11/32)	103	61	10	£52.99
30220880	8,8	103	61	10	£52.99
30220890	8,9	103	61	10	£52.99
30220900	9,0	103	61	10	£52.99
30220910	9,1	103	61	10	£52.99
30220913	9,13 (23/64)	103	61	10	£52.99
30220920	9,2	103	61	10	£52.99
30220925	9,25	103	61	10	£52.99

HYP-HPO-5D

COATED CARBIDE DRILL WITH OIL HOLE DRILLING 5XD

HYP-HPO-5D					
EDP	D	L	l	d	Price
30220930	9,3	103	61	10	£52.99
30220940	9,4	103	61	10	£52.99
30220950	9,5	103	61	10	£52.99
30220952	9,52 (3/8)	103	61	10	£52.99
30220960	9,6	103	61	10	£52.99
30220970	9,7	103	61	10	£52.99
30220980	9,8	103	61	10	£52.99
30220990	9,9	103	61	10	£52.99
30220992	9,92 (25/64)	103	61	10	£52.99
30221000	10,0	103	61	10	£52.99
30221010	10,1	118	71	12	£81.77
30221020	10,2	118	71	12	£81.77
30221030	10,3	118	71	12	£81.77
30221032	10,32 (13/32)	118	71	12	£81.77
30221040	10,4	118	71	12	£81.77
30221050	10,5	118	71	12	£81.77
30221060	10,6	118	71	12	£81.77
30221070	10,7	118	71	12	£81.77
30221072	10,72 (27/64)	118	71	12	£81.77
30221080	10,8	118	71	12	£81.77
30221090	10,9	118	71	12	£81.77
30221100	11,0	118	71	12	£81.77
30221110	11,1	118	71	12	£81.77
30221111	11,11 (7/16)	118	71	12	£81.77
30221120	11,2	118	71	12	£81.77
30221130	11,3	118	71	12	£81.77
30221140	11,4	118	71	12	£81.77
30221150	11,5	118	71	12	£81.77

HYP-HPO-5D					
EDP	D	L	l	d	Price
30221151	11,51 (29/64)	118	71	12	£81.77
30221160	11,6	118	71	12	£81.77
30221170	11,7	118	71	12	£81.77
30221180	11,8	118	71	12	£81.77
30221190	11,9	118	71	12	£81.77
30221191	11,91 (15/32)	118	71	12	£81.77
30221200	12,0	118	71	12	£81.77
30221230	12,3 (31/64)	124	77	14	£103.50
30221250	12,5	124	77	14	£103.50
30221270	12,7 (1/2)	124	77	14	£103.50
30221300	13,0	124	77	14	£103.50
30221350	13,5	124	77	14	£103.50
30221400	14,0	124	77	14	£103.50
30221429	14,29 (9/16)	133	83	16	£129.89
30221450	14,5	133	83	16	£129.89
30221500	15,0	133	83	16	£129.89
30221550	15,5	133	83	16	£129.89
30221587	15,87 (5/8)	133	83	16	£129.89
30221600	16,0	133	83	16	£129.89
30221650	16,5	143	93	18	£204.00
30221700	17,0	143	93	18	£204.00
30221750	17,5	143	93	18	£204.00
30221800	18,0	143	93	18	£204.00
30221850	18,5	153	101	20	£223.30
30221900	19,0	153	101	20	£223.30
30221950	19,5	153	101	20	£223.30
30222000	20,0	153	101	20	£223.30

◎ EXCELLENT ○ GOOD

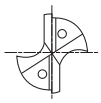
Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	◎	◎	◎	◎	○			○	○		◎	◎
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Vinyl	CFRP
								○	○			

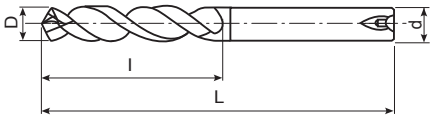
HYP-HPO-8D

COATED CARBIDE DRILL WITH OIL HOLE DRILLING 8XD

- OSG Standard, 2 flutes, for general applications
- Material : MG (micro grain carbide)
- Surface treatment : TiALN

Icon key page 2





HYP-HPO-8D					
EDP	D	L	l	d	Price
32210300	3.0	70	30	4	£57.30
32210310	3.1	74	34	4	£58.16
32210317	3.17 (1/8)	74	34	4	£58.16
32210320	3.2	74	34	4	£58.16
32210330	3.3	74	34	4	£58.16
32210340	3.4	74	34	4	£58.16
32210350	3.5	80	40	4	£59.96
32210357	3.57 (9/64)	80	40	4	£59.96
32210360	3.6	80	40	4	£59.96
32210370	3.7	80	40	4	£59.96
32210380	3.8	80	40	4	£59.96
32210390	3.9	80	40	4	£59.96
32210397	3.97 (5/32)	80	40	4	£59.96
32210400	4.0	80	40	4	£59.08
32210410	4.1	90	43	6	£61.27
32210420	4.2	90	43	6	£61.27
32210430	4.3	90	43	6	£61.27
32210437	4.37 (11/64)	90	43	6	£61.27
32210440	4.4	90	50	6	£61.27
32210450	4.5	90	50	6	£61.27
32210460	4.6	90	50	6	£61.27
32210470	4.7	90	50	6	£61.27
32210476	4.76 (3/16)	90	50	6	£61.27
32210480	4.8	90	50	6	£61.27
32210490	4.9	90	50	6	£61.27
32210500	5.0	90	50	6	£60.37
32210510	5.1	97	57	6	£63.43
32210516	5.16 (13/64)	97	57	8	£63.43
32210520	5.2	97	57	6	£63.43
32210530	5.3	97	57	8	£63.43
32210540	5.4	97	57	6	£63.43
32210550	5,5	97	57	8	£87.28
32210556	5.56 (7/32)	97	57	6	£63.43
32210560	5.6	97	57	8	£63.43
32210570	5.7	97	57	6	£63.43
32210580	5.8	97	57	8	£63.43
32210590	5.9	97	57	6	£63.43
32210595	5.95 (15/64)	97	57	8	£63.43
32210600	6.0	97	57	6	£63.43
32210610	6.1	106	66	8	£74.23
32210620	6.2	106	66	8	£74.23

HYP-HPO-8D					
EDP	D	L	l	d	Price
32210630	6.3	106	66	8	£74.23
32210635	6,35 (1/4)	106	66	8	£74.23
32210640	6.4	106	66	8	£74.23
32210650	6,5	106	66	8	£74.23
32210660	6.6	106	66	8	£74.23
32210670	6.7	106	66	8	£74.23
32210675	6.75 (17/64)	106	66	8	£74.23
32210680	6,8	106	66	8	£74.23
32210690	6.9	116	76	8	£74.23
32210700	7.0	116	76	8	£74.23
32210710	7.1	116	76	8	£74.23
32210714	7.14 (9/32)	116	76	8	£74.23
32210720	7.2	116	76	8	£74.23
32210730	7.3	116	76	8	£74.23
32210740	7.4	116	76	8	£74.23
32210750	7,5	116	76	8	£74.23
32210754	7.54 (19/64)	116	76	8	£74.23
32210760	7.6	116	76	8	£74.23
32210770	7.7	116	76	8	£74.23
32210780	7,8	116	76	8	£74.23
32210790	7.9	116	76	8	£74.23
32210794	7.94 (5/16)	116	76	8	£74.23
32210800	8.0	116	76	8	£74.23
32210810	8.1	131	87	10	£104.61
32210820	8.2	131	87	10	£104.61
32210830	8.3	131	87	10	£104.61
32210833	8.33 (21/64)	131	87	10	£104.61
32210840	8.4	131	87	10	£104.61
32210850	8,5	131	87	10	£104.61
32210860	8.6	131	87	10	£104.61
32210870	8.7	131	87	10	£104.61
32210873	8.73 (11/32)	131	87	10	£104.61
32210880	8.8	131	87	10	£104.61
32210890	8.9	131	87	10	£104.61
32210900	9.0	131	87	10	£104.61
32210910	9.1	139	95	10	£104.61
32210913	9.13 (23/64)	139	95	10	£104.61
32210920	9.2	139	95	10	£104.61
32210930	9.3	139	95	10	£104.61
32210940	9.4	139	95	10	£104.61
32210950	9,5	139	95	10	£104.61

HYP-HPO-8D

COATED CARBIDE DRILL WITH OIL HOLE DRILLING 8XD

HYP-HPO-8D					
EDP	D	L	l	d	Price
32210952	9,52 (3/8)	139	95	10	£104.61
32210960	9.6	139	95	10	£104.61
32210970	9.7	139	95	10	£104.61
32210980	9.8	139	95	10	£104.61
32210990	9.9	139	95	10	£104.61
32210992	9.92 (25/64)	139	95	10	£104.61
32211000	10.0	139	95	10	£104.61
32211010	10.1	155	106	12	£150.63
32211020	10,2	155	106	12	£150.63
32211030	10.3	155	106	12	£150.63
32211032	10.32 (13/32)	155	106	12	£150.63
32211040	10.4	155	106	12	£150.63
32211050	10,5	155	106	12	£150.63
32211060	10.6	155	106	12	£150.63
32211070	10.7	155	106	12	£150.63
32211072	10.72 (27/64)	155	106	12	£150.63
32211080	10.8	155	106	12	£150.63
32211090	10.9	155	106	12	£150.63
32211100	11.0	155	106	12	£150.63
32211110	11.1	163	114	12	£150.63
32211111	11.11 (7/16)	163	114	12	£150.63
32211120	11.2	163	114	12	£150.63
32211130	11.3	163	114	12	£150.63
32211140	11.4	163	114	12	£150.63
32211150	11,5	163	114	12	£150.63
32211151	11.51 (29/64)	163	114	12	£150.63

HYP-HPO-8D					
EDP	D	L	l	d	Price
32211160	11.6	163	114	12	£150.63
32211170	11.7	163	114	12	£150.63
32211180	11.8	163	114	12	£150.63
32211190	11.9	163	114	12	£150.63
32211191	11.91 (15/32)	163	114	12	£150.63
32211200	12.0	163	114	12	£150.63
32211230	12.3 (31/64)	182	133	14	£213.74
32211250	12,5	182	133	14	£213.74
32211270	12,7 (1/2)	182	133	14	£213.74
32211300	13.0	182	133	14	£213.74
32211350	13,5	182	133	14	£213.74
32211400	14.0	182	133	14	£213.74
32211429	14.29 (9/16)	204	152	16	£295.70
32211450	14,5	204	152	16	£295.70
32211500	15.0	204	152	16	£295.70
32211550	15,5	204	152	16	£295.70
32211587	15.87 (5/8)	204	152	16	£295.70
32211600	16.0	204	152	16	£428.44
32211650	16.5	223	171	18	£428.44
32211700	17.0	223	171	18	£428.44
32211750	17.5	223	171	18	£428.44
32211800	18.0	223	171	18	£428.44
32211850	18.5	244	190	20	£428.44
32211900	19.0	244	190	20	£428.44
32211950	19.5	244	190	20	£428.44
32212000	20.0	244	190	20	£428.44

◎ EXCELLENT ○ GOOD

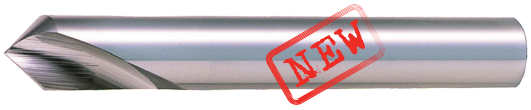
Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	◎	◎	◎	◎	○			○	○		◎	◎
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Vinyl	CFRP
								○	○			

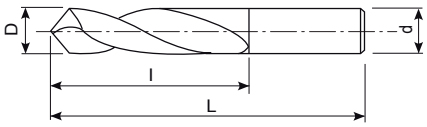
HYP-LDS

MICRO GRAIN CARBIDE SPOTTING & CHAMFERING DRILL

- OSG Standard, 2, Flutes , for general applications
- Material : Micro Grain Carbide.
- Surface treatment : Bright

Icon key page 2





HYP-LDS (90deg)						
EDP	D	L	l	d	a	Price
20900300	3	35	8	3	90	£10.04
20900400	4	40	10	4	90	£12.31
20900600	6	50	16	6	90	£16.86
20900800	8	60	23	8	90	£22.17

HYP-LDS (90deg)						
EDP	D	L	l	d	a	Price
20901000	10	70	24	10	90	£35.33
20901200	12	70	25	12	90	£41.79
20901600	16	80	30	16	90	£76.02
20902000	20	100	35	20	90	£133.57

HYP-LDS (120deg)						
EDP	D	L	l	d	a	Price
21200300	3	35	8	3	120	£10.04
21200400	4	40	10	4	120	£12.31
21200600	6	50	16	6	120	£16.86
21200800	8	60	23	8	120	£22.17

HYP-LDS (120deg)						
EDP	D	L	l	d	a	Price
21201000	10	70	24	10	120	£35.33
21201200	12	70	25	12	120	£41.79
21201600	16	80	30	16	120	£76.02
21202000	20	100	35	20	120	£133.57

HYP-LDS (142deg)						
EDP	D	L	l	d	a	Price
21420300	3	35	8	3	142	£10.04
21420400	4	40	10	4	142	£12.31
21420600	6	50	16	6	142	£16.86
21420800	8	60	23	8	142	£22.17

HYP-LDS (142deg)						
EDP	D	L	l	d	a	Price
21421000	10	70	24	10	142	£35.33
21421200	12	70	25	12	142	£41.79
21421600	16	80	30	16	142	£76.02
21422000	20	100	35	20	142	£133.57

◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
◎	◎	◎	◎	◎	○				○		◎	◎
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Vinyl	CFRP
○					○			○	○			

Tool refurbishment service

- Performance tools ground to original specification
- State of the art regrinding facility
- Tools inspected to OSG standards
- Deliveries as short as 5 days

Special tap service

Our vast experience and expertise in the production of Special Taps since 1969 has made OSG UK a leading force in the special tap market. Together with our parent company OSG Corporation of Japan, we are able to offer exceptional technical support and production capability.

In addition to producing made to order taps, OSG UK are probably the largest stockists of special taps in the UK today.

1

All styles and specifications of taps can be considered and our comprehensive stock of pre-prepared blanks gives us the ability to offer a quick turnaround on many designs.

2

All thread grinding on your prepared components can be considered.

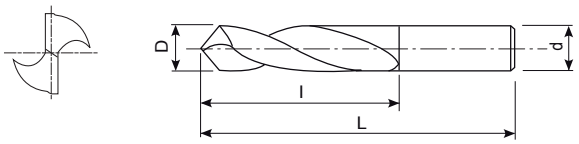
3

Whatever your requirements for special taps, please contact us.

HC-H-DRL

SLOW SPIRAL CARBIDE DRILL

- OSG Standard, 2 flutes , stub, for difficult to drill materials
- Material : MG (micro grain carbide)
- Surface treatment : Bright



Drill dia tol : +.000 / -.013mm

Icon key page 2

H-CH-DRL					
EDP	D	L	l	d	Price
215-0394	1	38	13	1	£6.57
215-0433	1,1	38	13	1,1	£6.57
215-0472	1,2	38	13	1,2	£6.57
215-0512	1,3	38	13	1,3	£6.57
215-0551	1,4	38	13	1,4	£6.57
215-0591	1,5	38	13	1,5	£5.92
215-0630	1,6	43	18	1,6	£6.27
215-0669	1,7	43	18	1,7	£6.27
215-0709	1,8	43	18	1,8	£6.27
215-0748	1,9	43	18	1,9	£6.27
215-0787	2	45	19	2	£6.27
215-0827	2,1	45	19	2,1	£7.09
215-0866	2,2	45	19	2,2	£7.09
215-0906	2,3	45	19	2,3	£7.09
215-0945	2,4	46	21	2,4	£7.09
215-0984	2,5	46	21	2,5	£7.09
215-1024	2,6	46	21	2,6	£7.97
215-1063	2,7	46	21	2,7	£7.97
215-1102	2,8	48	22	2,8	£7.97
215-1142	2,9	48	22	2,9	£7.97
215-1181	3	48	22	3	£7.97
215-1220	3,1	48	22	3,1	£9.40
215-1260	3,2	52	24	3,2	£9.40
215-1299	3,3	52	24	3,3	£9.40
215-1339	3,4	52	24	3,4	£9.40
215-1378	3,5	52	24	3,5	£9.40
215-1417	3,6	52	25	3,6	£10.62
215-1457	3,7	52	25	3,7	£10.62
215-1496	3,8	52	25	3,8	£10.62
215-1535	3,9	52	25	3,9	£10.62
215-1575	4	53	27	4	£10.62
215-1614	4,1	53	27	4,1	£12.54
215-1654	4,2	53	27	4,2	£12.54
215-1693	4,3	53	27	4,3	£12.54
215-1732	4,4	55	29	4,4	£12.54
215-1772	4,5	55	29	4,5	£12.54
215-1811	4,6	55	29	4,6	£13.65
215-1850	4,7	57	29	4,7	£13.65
215-1890	4,8	57	30	4,8	£13.65
215-1929	4,9	57	30	4,9	£13.65
215-1968	5	57	30	5	£13.65

H-CH-DRL					
EDP	D	L	l	d	Price
215-2008	5,1	57	30	5,1	£15.49
215-2047	5,2	60	32	5,2	£15.49
215-2087	5,3	60	32	5,3	£15.49
215-2126	5,4	60	32	5,4	£15.49
215-2165	5,5	60	32	5,5	£15.49
215-2205	5,6	61	33	5,6	£17.49
215-2244	5,7	61	33	5,7	£17.49
215-2283	5,8	61	33	5,8	£17.49
215-2323	5,9	61	33	5,9	£17.49
215-2362	6	61	33	6	£17.49
215-2402	6,1	63	35	6,1	£19.54
215-2441	6,2	63	35	6,2	£19.54
215-2480	6,3	63	35	6,3	£19.54
215-2520	6,4	63	35	6,4	£19.54
215-2559	6,5	63	35	6,5	£19.54
215-2598	6,6	67	37	6,6	£22.87
215-2638	6,7	67	37	6,7	£22.87
215-2677	6,8	68	38	6,8	£22.87
215-2717	6,9	68	38	6,9	£22.87
215-2756	7	68	38	7	£22.87
215-2795	7,1	69	38	7,1	£25.09
215-2835	7,2	70	40	7,2	£25.09
215-2874	7,3	70	40	7,3	£25.09
215-2913	7,4	70	40	7,4	£25.09
215-2953	7,5	70	40	7,5	£25.09
215-2992	7,6	71	41	7,6	£28.40
215-3031	7,7	71	41	7,7	£28.40
215-3071	7,8	71	41	7,8	£28.40
215-3110	7,9	71	41	7,9	£28.40
215-3150	8	71	41	8	£28.40
215-3189	8,1	75	43	8,1	£31.13
215-3228	8,2	75	43	8,2	£31.13
215-3268	8,3	75	43	8,3	£31.13
215-3307	8,4	76	43	8,4	£31.13
215-3346	8,5	76	43	8,5	£31.13
215-3386	8,6	76	43	8,6	£36.00
215-3425	8,7	76	43	8,7	£36.00
215-3465	8,8	78	44	8,8	£36.00
215-3504	8,9	78	44	8,9	£36.00
215-3543	9	78	44	9	£36.00
215-3583	9,1	78	44	9,1	£39.97

HC-H-DRL

SLOW SPIRAL CARBIDE DRILL

H-CH-DRL					
EDP	D	L	l	d	Price
215-3622	9,2	79	46	9,2	£39.97
215-3661	9,3	79	46	9,3	£39.97
215-3701	9,4	79	46	9,4	£39.97
215-3740	9,5	79	46	9,5	£39.97
215-3780	9,6	83	48	9,6	£47.36
215-3819	9,7	83	48	9,7	£47.36
215-3858	9,8	83	48	9,8	£47.36
215-3898	9,9	83	48	9,9	£47.36
215-3937	10	83	48	10	£47.36
215-3976	10,1	84	49	10,1	£50.90
215-4016	10,2	84	49	10,2	£50.90
215-4055	10,3	84	49	10,3	£50.90
215-4094	10,4	86	51	10,4	£50.90
215-4134	10,5	86	51	10,5	£50.90
215-4173	10,6	86	51	10,6	£58.72

H-CH-DRL					
EDP	D	L	l	d	Price
215-4213	10,7	86	51	10,7	£58.72
215-4252	10,8	87	52	10,8	£58.72
215-4291	10,9	87	52	10,9	£58.72
215-4331	11	87	52	11	£58.72
215-4370	11,1	87	52	11,1	£63.82
215-4409	11,2	90	54	11,2	£63.82
215-4449	11,3	90	54	11,3	£63.82
215-4488	11,4	90	54	11,4	£63.82
215-4528	11,5	90	54	11,5	£63.82
215-4567	11,6	92	54	11,6	£66.02
215-4606	11,7	92	54	11,7	£66.02
215-4646	11,8	92	54	11,8	£66.02
215-4685	11,9	92	54	11,9	£66.02
215-4724	12	92	54	12	£66.02

◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	SCM	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	SUS	SKD	SC	GG	GGG
○	○	○	○	○	○			○	○		○	○
Cu	BS	BsC	PB	Al	AC,ADC	MC	ZDC	Ti	Ni	Plastic	Vinyl	CFRP
					○			○	○			

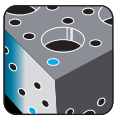
DRILLING CONDITIONS

HYP-HP-3D / HYP-HPO-3D

	Steel			Cu	A5052 / A7075	Al < 13% Si
	< 700 N/mm²	< 850 N/mm²	< 1000 N/mm²			< 130 HB
Vc	100 ~ 120 m/min	80 ~ 110 m/min	70 ~ 100 m/min	50 ~ 90 m/min	60 ~ 110 m/min	120 ~ 220 m/min
Ø	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)
3	0,09~0,12	0,09~0,12	0,09~0,12	0,02~0,03	0,09~0,20	0,09~0,28
4	0,10~0,15	0,10~0,15	0,10~0,15	0,02~0,04	0,10~0,24	0,10~0,38
5	0,12~0,18	0,12~0,18	0,12~0,18	0,03~0,05	0,12~0,28	0,12~0,40
6	0,14~0,20	0,14~0,20	0,14~0,20	0,03~0,06	0,14~0,34	0,14~0,48
8	0,16~0,24	0,16~0,24	0,16~0,24	0,04~0,08	0,16~0,38	0,16~0,53
10	0,18~0,27	0,18~0,27	0,18~0,27	0,05~0,10	0,18~0,45	0,18~0,63
12	0,20~0,30	0,20~0,30	0,20~0,30	0,06~0,12	0,20~0,53	0,20~0,75
14	0,22~0,35	0,22~0,35	0,22~0,35	0,08~0,16	0,22~0,57	0,22~0,81
16	0,25~0,36	0,25~0,36	0,25~0,36	0,10~0,18	0,25~0,61	0,25~0,85
18	0,28~0,38	0,28~0,38	0,28~0,38	0,12~0,20	0,28~0,63	0,28~0,90
20	0,30~0,40	0,30~0,40	0,30~0,40	0,20~0,28	0,28~0,68	0,30~0,98

HYP-HP-3D / HYP-HPO-3D

	GG (G)		SUS	High-Alloy Steel	Special Alloys	Hardened Steel
	< 180 HB	< 300 HB	< 820 HB	< 1200 N/mm²	< 30 HRC	< 55 HRC
Vc	120 ~ 150 m/min	100 ~ 120 m/min	40 ~ 50 m/min	50 ~60 m/min	15 ~ 25 m/min	15 ~ 25 m/min
Ø	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)
3	0,12~0,15	0,12~0,15	0,09~0,12	0,07~0,11	0,05~0,09	0,03~0,05
4	0,13~0,18	0,13~0,18	0,10~0,15	0,08~0,13	0,06~0,10	0,04~0,06
5	0,15~0,22	0,15~0,22	0,12~0,18	0,10~0,15	0,08~0,12	0,05~0,07
6	0,18~0,25	0,18~0,25	0,14~0,20	0,12~0,18	0,09~0,15	0,05~0,07
8	0,20~0,30	0,20~0,30	0,16~0,24	0,14~0,22	0,12~0,20	0,06~0,08
10	0,23~0,33	0,23~0,33	0,18~0,27	0,15~0,25	0,13~0,23	0,07~0,10
12	0,25~0,38	0,25~0,38	0,20~0,30	0,17~0,26	0,14~0,24	0,09~0,12
14	0,30~0,43	0,30~0,43	0,22~0,35	0,18~0,30	0,15~0,26	0,10~0,13
16	0,35~0,50	0,35~0,50	0,25~0,36	0,20~0,32	0,16~0,26	0,10~0,13
18	0,38~0,55	0,38~0,55	0,28~0,38	0,23~0,33	0,18~0,28	0,12~0,16
20	0,40~0,63	0,40~0,63	0,30~0,40	0,25~0,35	0,20~0,30	0,14~0,18



HYP-HP-5D / HYP-HPO-5D / HYP-HPO-8D

	Steel			Cu	A5052 / A7075	Al < 13% Si
	< 700 N/mm²	< 850 N/mm²	< 1000 N/mm²			< 130 HB
Vc	100 ~ 120 m/min	80 ~ 110 m/min	70 ~ 100 m/min	50 ~ 90 m/min	60 ~ 110 m/min	120 ~ 220 m/min
Ø	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)
3	0,09~0,12	0,09~0,12	0,09~0,12	0,02~0,03	0,09~0,20	0,09~0,28
4	0,10~0,15	0,10~0,15	0,10~0,15	0,02~0,04	0,10~0,24	0,10~0,38
5	0,12~0,18	0,12~0,18	0,12~0,18	0,03~0,05	0,12~0,28	0,12~0,40
6	0,14~0,20	0,14~0,20	0,14~0,20	0,03~0,06	0,14~0,34	0,14~0,48
8	0,16~0,24	0,16~0,24	0,16~0,24	0,04~0,08	0,16~0,38	0,16~0,53
10	0,18~0,27	0,18~0,27	0,18~0,27	0,05~0,10	0,18~0,45	0,18~0,63
12	0,20~0,30	0,20~0,30	0,20~0,30	0,06~0,12	0,20~0,53	0,20~0,75
14	0,22~0,35	0,22~0,35	0,22~0,35	0,08~0,16	0,22~0,57	0,22~0,81
16	0,25~0,36	0,25~0,36	0,25~0,36	0,10~0,18	0,25~0,61	0,25~0,85
18	0,28~0,38	0,28~0,38	0,28~0,38	0,12~0,20	0,28~0,63	0,28~0,90
20	0,30~0,40	0,30~0,40	0,30~0,40	0,20~0,28	0,28~0,68	0,30~0,98

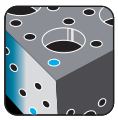
HYP-HP-5D / HYP-HPO-5D / HYP-HPO-8D

	GG (G)		SUS	High-Alloy Steel	Special Alloys	Hardened Steel
	< 180 HB	< 300 HB	< 820 HB	< 1200 N/mm²	< 30 HRC	< 55 HRC
Vc	120 ~ 150 m/min	100 ~ 120 m/min	40 ~ 50 m/min	50 ~60 m/min	15 ~ 25 m/min	15 ~ 25 m/min
Ø	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)
3	0,12~0,15	0,12~0,15	0,09~0,12	0,07~0,11	0,05~0,09	0,03~0,05
4	0,13~0,18	0,13~0,18	0,10~0,15	0,08~0,13	0,06~0,10	0,04~0,06
5	0,15~0,22	0,15~0,22	0,12~0,18	0,10~0,15	0,08~0,12	0,05~0,07
6	0,18~0,25	0,18~0,25	0,14~0,20	0,12~0,18	0,09~0,15	0,05~0,07
8	0,20~0,30	0,20~0,30	0,16~0,24	0,14~0,22	0,12~0,20	0,06~0,08
10	0,23~0,33	0,23~0,33	0,18~0,27	0,15~0,25	0,13~0,23	0,07~0,10
12	0,25~0,38	0,25~0,38	0,20~0,30	0,17~0,26	0,14~0,24	0,09~0,12
14	0,30~0,43	0,30~0,43	0,22~0,35	0,18~0,30	0,15~0,26	0,10~0,13
16	0,35~0,50	0,35~0,50	0,25~0,36	0,20~0,32	0,16~0,26	0,10~0,13
18	0,38~0,55	0,38~0,55	0,28~0,38	0,23~0,33	0,18~0,28	0,12~0,16
20	0,40~0,63	0,40~0,63	0,30~0,40	0,25~0,35	0,20~0,30	0,14~0,18

When using non-through coolant drills we recommend that you reduce speeds / feeds by 10~15%

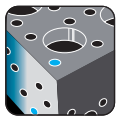
DRILLING CONDITIONS

HYP-LDS



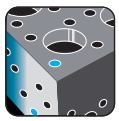
	C≤0,2%		Carbon Steel		Alloy Steel		Special Steel		Special Steel		Cast Iron		Cast Al	
	St40 ~ 500 N/mm²		CK45 500 ~ 710 N/mm²		SCM440 710 ~ 900 N/mm²		SKD61 28 HRC		SKD11 34 HRC		GG25 ~ 350 N/mm²		AC4D	
Vc	63 ~ 80 m/min		40 ~ 63 m/min		32 ~ 50 m/min		20 ~ 28 m/min		16 ~ 22 m/min		63 ~ 100 m/min		80 ~ 160 m/min	
Ø	S (min⁻¹)	F (mm/rev.)	S (min⁻¹)	F (mm/rev.)	S (min⁻¹)	F (mm/rev.)	S (min⁻¹)	F (mm/rev.)	S (min⁻¹)	F (mm/rev.)	S (min⁻¹)	F (mm/rev.)	S (min⁻¹)	F (mm/rev.)
3	7.500	0,04~0,08	5.500	0,04~0,08	4.500	0,04~0,08	2.500	0,04~0,08	2.000	0,04~0,08	8.000	0,05~0,09	12.000	0,10~0,22
4	5.700	0,05~0,10	4.100	0,05~0,10	3.300	0,05~0,10	1.900	0,05~0,10	1.500	0,05~0,10	6.500	0,07~0,12	9.500	0,12~0,25
6	3.800	0,06~0,12	2.700	0,06~0,12	2.300	0,06~0,12	1.250	0,06~0,12	1.000	0,06~0,12	4.300	0,12~0,18	6.400	0,14~0,28
8	2.800	0,08~0,15	2.000	0,08~0,15	1.700	0,08~0,15	950	0,08~0,15	750	0,08~0,15	3.200	0,13~0,20	4.800	0,18~0,32
10	2.300	0,10~0,18	1.700	0,10~0,18	1.400	0,10~0,18	750	0,10~0,18	600	0,10~0,18	2.600	0,17~0,25	3.800	0,22~0,36
12	1.900	0,12~0,21	1.400	0,12~0,21	1.200	0,12~0,21	650	0,12~0,21	500	0,12~0,21	2.200	0,21~0,30	3.200	0,25~0,40
16	1.400	0,16~0,28	1.000	0,16~0,28	900	0,16~0,28	500	0,16~0,28	380	0,16~0,28	1.600	0,24~0,32	2.400	0,32~0,48
20	1.150	0,20~0,34	820	0,20~0,34	700	0,20~0,34	400	0,20~0,34	300	0,20~0,34	1.300	0,26~0,40	1.900	0,40~0,60

HC-H-DRL



	Cast Iron	Mild Steels Carbon Steels	Alloy Tool Steels Tool Steels	Hardened Steels Prehardened Steels		Titanium Alloys (Annealed)
	< 180 HB	< 1000 N/mm²	< 1200 N/mm²	< 35 HRC	< 45 HRC	< 38 HRC
Vc	90 m/min	90 m/min	85 m/min	55 ~65 m/min	45 ~ 55 m/min	40m/min
Ø	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)
1	0,02	0,025	0,01	0,01	0,01	0,01
2	0,04	0,05	0,02	0,02	0,02	0,02
3	0,05	0,07	0,03	0,03	0,03	0,03
4	0,07	0,08	0,04	0,04	0,04	0,04
5	0,09	0,09	0,05	0,05	0,05	0,04
6	0,10	0,10	0,05	0,06	0,06	0,05
8	0,11	0,12	0,06	0,07	0,07	0,06
10	0,12	0,15	0,10	0,10	0,10	0,06
12	0,14	0,19	0,13	0,11	0,11	0,07

HC-H-DRL



	Special Alloys Inconel	Aluminium	Graphite Composite	Epoxy Fibre	Acrylic Plastics	Composite Titanium Stack
	< 42 HRC	< 130 HB				
Vc	15 ~ 20 m/min	150 ~ 180 m/min	50 ~ 70 m/min	50 ~70 m/min	40 ~ 60 m/min	5 m/min
Ø	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)
1	0,007	0,02	n/a	n/a	n/a	n/a
2	0,015	0,05	0,03	0,03	0,03	0,02
3	0,02	0,07	0,05	0,05	0,05	0,02
4	0,02	0,09	0,06	0,06	0,06	0,02
5	0,03	0,11	0,07	0,07	0,07	0,05
6	0,04	0,11	0,10	0,10	0,10	0,05
8	0,04	0,14	0,12	0,12	0,12	0,07
10	0,05	0,17	0,13	0,13	0,13	0,10
12	0,05	0,20	0,14	0,14	0,14	0,10

When drilling deep holes using HC-H-DRL, the recommended speeds and feeds should be reduced proportionally based on the hole depth.
See table opposite for guidelines for reducing the speeds and feeds.

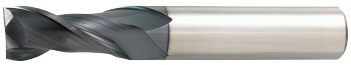
HC-H-DRL

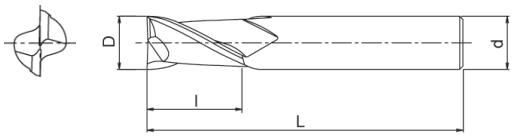
Drilling Depth	Spindle Speed Reduction	Feed Rate Reduction
3 x Dia	10%	10%
4 x Dia	20%	10%
5 x Dia	30%	20%
6 x Dia	35%	20%
8 x Dia	40%	20%

HYP-EDS / HYP-EDS-XCEED

- 2 flutes, regular, centre cutting, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright / TiALN Coated

Icon key page 2





Bright

HYP-EDS	
EDP	Price
402-0394	£9.80
402-0591	£6.32
402-0787	£6.95
402-0984	£6.32
402-1181	£6.32
402-1378	£8.71
402-1575	£9.09
402-1772	£9.64
402-1968	£9.64
402-2362	£11.51
402-2756	£13.72
402-3150	£13.36
402-3543	£15.38
402-3937	£18.01
402-4331	£24.71
402-4724	£29.64
402-5512	£41.65
402-6299	£51.10
402-7087	£65.97
402-7874	£74.86
402-8661	£127.56
402-9843	£138.64

TiALN coated

HYP-EDS-XCEED	
EDP	Price
402-039411	£16.90
402-059111	£14.05
402-078711	£14.69
402-098411	£14.05
402-118111	£14.05
402-137811	£16.45
402-157511	£16.83
402-177211	£17.38
402-196811	£17.38
402-236211	£19.24
402-275611	£23.12
402-315011	£22.79
402-354311	£26.15
402-393711	£27.43
402-433111	£35.86
402-472411	£40.79
402-551211	£52.79
402-629911	£67.67
402-708711	£82.55
402-787411	£96.95
402-866111	£155.17
402-984311	£166.24

Dimensions			
D	L	l	d
1	39	3	3
1,5	39	5	3
2	39	7	3
2,5	39	8	3
3	39	10	3
3,5	51	12	4
4	51	14	4
4,5	51	14	5
5	51	16	5
6	64	19	6
7	64	19	8
8	64	21	8
9	70	22	10
10	70	25	10
11	70	25	11
12	76	25	12
14	89	30	14
16	89	32	16
18	102	35	18
20	102	38	20
22	102	38	22
25	102	38	25

HYP-EDS (uncoated)

◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	○	○	○	○	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○								

HYP-EDS-XCEED (coated)

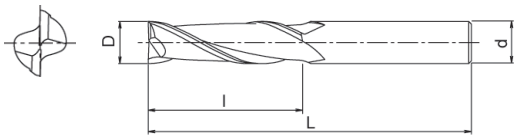
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	◎	◎	◎	◎	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○				○				

HYP-EDL

- 2 flutes, long, centre cutting, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright

Icon key page 2



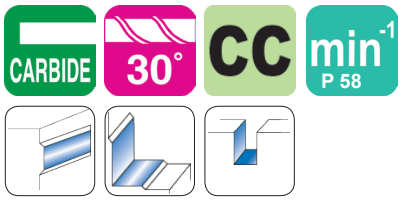
EDP	Dimensions				Price
	D	L	l	d	
462-1181	3	57	19	3	£11.94
462-1575	4	57	19	4	£13.30
462-1968	5	64	25	5	£13.70
462-2362	6	76	28	6	£17.56
462-3150	8	76	29	8	£21.56
462-3937	10	76	32	10	£27.40
462-4724	12	102	51	12	£50.03
462-5512	14	127	57	14	£78.72
462-6299	16	127	57	16	£96.00
462-7087	18	127	57	18	£110.28
462-7874	20	127	57	20	£124.96
462-9843	25	127	57	25	£250.51

◎ EXCELLENT ○ GOOD

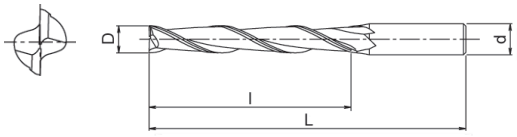
Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	○	○	○	○	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○								

HYP-EDXL

- 2 flutes, extra long, centre cutting, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright



Icon key page 2



EDP	Dimensions				Price
	D	L	l	d	
482-1181	3	76	25	3	£13.65
482-1575	4	76	28	4	£14.75
482-1968	5	76	32	5	£16.05
482-2362	6	102	38	6	£21.43
482-3150	8	102	42	8	£27.22
482-3937	10	102	45	10	£35.26
482-4724	12	153	76	12	£79.56
482-5512	14	153	76	14	£108.46
482-6299	16	153	76	16	£132.65
482-7087	18	153	76	18	£152.56
482-7874	20	153	76	20	£164.96
482-9843	25	153	76	25	£298.76

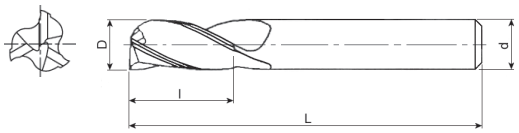
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	○	○	○	○	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○								

HYP-ETS / HYP-ETS-XCEED

- 3 flutes, regular, centre cutting, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright / TiALN Coated

Icon key page 2



Bright

HYP-ETS	
EDP	Price
403-0394	£9.80
403-0591	£6.32
403-0787	£6.95
403-0984	£6.32
403-1181	£6.32
403-1378	£8.71
403-1575	£9.09
403-1772	£9.64
403-1968	£9.64
403-2362	£11.51
403-2756	£13.72
403-3150	£13.36
403-3543	£15.38
403-3937	£18.01
403-4331	£24.71
403-4724	£29.64
403-5512	£41.65
403-6299	£51.10
403-7087	£65.97
403-7874	£74.86
403-8661	£127.56
403-9843	£138.64

TiALN coated

HYP-ETS-XCEED	
EDP	Price
403-039411	£16.90
403-059111	£14.05
403-078711	£14.69
403-098411	£14.05
403-118111	£14.05
403-137811	£16.45
403-157511	£16.83
403-177211	£17.38
403-196811	£17.38
403-236211	£19.24
403-275611	£23.12
403-315011	£22.79
403-354311	£26.15
403-393711	£27.43
403-433111	£35.86
403-472411	£40.79
403-551211	£52.79
403-629911	£67.67
403-708711	£82.55
403-787411	£96.95
403-866111	£155.17
403-984311	£166.24

Dimensions			
D	L	l	d
1	39	3	3
1,5	39	5	3
2	39	7	3
2,5	39	8	3
3	39	10	3
3,5	51	12	4
4	51	14	4
4,5	51	14	5
5	51	16	5
6	64	19	6
7	64	19	8
8	64	21	8
9	70	22	10
10	70	25	10
11	70	25	11
12	76	25	12
14	89	30	14
16	89	32	16
18	102	35	18
20	102	38	20
22	102	38	22
25	102	38	25

HYP-ETS (uncoated)

◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	○	○	○	○	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○								

HYP-ETS-XCEED (coated)

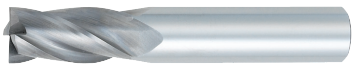
◎ EXCELLENT ○ GOOD

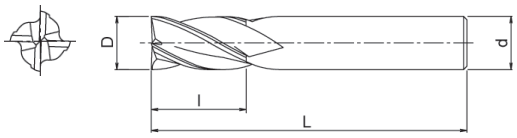
Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	◎	◎	◎	◎	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○				○				

HYP-EMS / HYP-EMS-XCEED

- 4 flutes, regular, centre cutting, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright / TiALN Coated

Icon key page 2





Bright

HYP-EMS	
EDP	Price
404-0394	£9.80
404-0591	£6.32
404-0787	£6.95
404-0984	£6.32
404-1181	£6.32
404-1378	£8.71
404-1575	£9.09
404-1772	£9.64
404-1968	£9.64
404-2362	£11.51
404-2756	£13.72
404-3150	£13.36
404-3543	£15.38
404-3937	£18.01
404-4331	£24.71
404-4724	£29.64
404-5512	£41.65
404-6299	£51.10
404-7087	£65.97
404-7874	£74.86
404-8661	£127.56
404-9843	£138.64

TiALN coated

HYP-EMS-XCEED	
EDP	Price
404-039411	£16.90
404-059111	£14.05
404-078711	£14.69
404-098411	£14.05
404-118111	£14.05
404-137811	£16.45
404-157511	£16.83
404-177211	£17.38
404-196811	£17.38
404-236211	£19.24
404-275611	£23.12
404-315011	£22.79
404-354311	£26.15
404-393711	£27.43
404-433111	£35.86
404-472411	£40.79
404-551211	£52.79
404-629911	£67.67
404-708711	£82.55
404-787411	£96.95
404-866111	£155.17
404-984311	£166.24

Dimensions			
D	L	l	d
1	39	3	3
1,5	39	5	3
2	39	7	3
2,5	39	8	3
3	39	10	3
3,5	51	12	4
4	51	14	4
4,5	51	14	5
5	51	16	5
6	64	19	6
7	64	19	8
8	64	21	8
9	70	22	10
10	70	25	10
11	70	25	11
12	76	25	12
14	89	30	14
16	89	32	16
18	102	35	18
20	102	38	20
22	102	38	22
25	102	38	25

HYP-EMS (uncoated)

◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	○	○	○	○	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○								

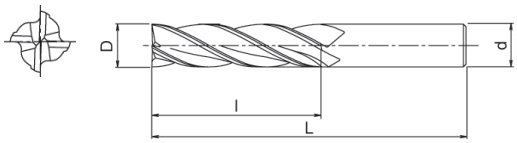
HYP-EMS-XCEED (coated)

◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	◎	◎	◎	◎	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○				○				

- 4 flutes, long, centre cutting, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright

Icon key page 2



EDP	Dimensions				Price
	D	L	l	d	
464-1181	3	57	19	3	£11.76
464-1575	4	57	19	4	£13.30
464-1968	5	64	25	5	£13.70
464-2362	6	76	28	6	£17.56
464-3150	8	76	29	8	£28.50
464-3937	10	76	32	10	£27.40
464-4724	12	102	51	12	£50.03
464-5512	14	127	57	14	£78.72
464-6299	16	127	57	16	£96.00
464-7087	18	127	57	18	£110.40
464-7874	20	127	57	20	£124.96
464-9843	25	127	57	25	£250.51

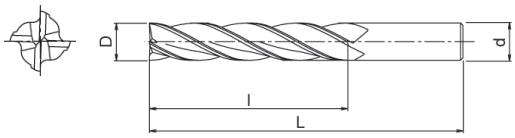
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	○	○	○	○	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○								

HYP-EMXL

- 4 flutes, extra long, centre cutting, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright

Icon key page 2



EDP	Dimensions				Price
	D	L	l	d	
484-1181	3	76	25	3	£13.65
484-1575	4	76	28	4	£14.75
484-1968	5	76	32	5	£16.05
484-2362	6	102	38	6	£21.43
484-3150	8	102	42	8	£27.22
484-3937	10	102	45	10	£35.26
484-4724	12	153	76	12	£79.56
484-5512	14	153	76	14	£108.46
484-6299	16	153	76	16	£132.65
484-7087	18	153	76	18	£152.56
484-7874	20	153	76	20	£164.96
484-9843	25	153	76	25	£298.76

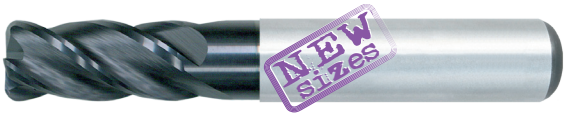
◎ EXCELLENT ○ GOOD

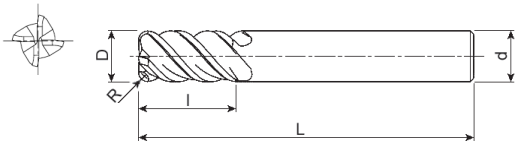
Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	○	○	○	○	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○								

HYP-CR-EMS

- 4 flutes, regular, corner radius, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : TiALN Coated

Icon key page 2

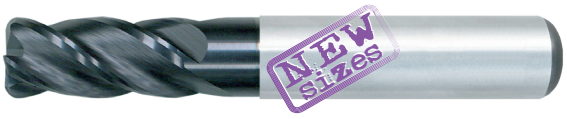


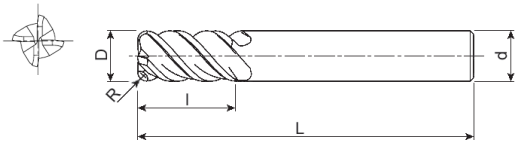


EDP	Dimensions					Price
	D	R	L	l	d	
404-1575R025	4	0,25	51	14	4	£17.04
404-1575R04	4	0,4	51	14	4	£17.04
404-1575R05	4	0,5	51	14	4	£17.04
404-1575R075	4	0,75	51	14	4	£17.04
404-1575R10	4	1,0	51	14	4	£17.04
404-1575R15	4	1,5	51	14	4	£17.04
404-1968R025	5	0,25	51	16	5	£18.48
404-1968R05	5	0,5	51	16	5	£18.48
404-1968R075	5	0,75	51	16	5	£18.48
404-1968R10	5	1,0	51	16	5	£18.48
404-1968R125	5	1,25	51	16	5	£18.48
404-1968R15	5	1,5	51	16	5	£18.48
404-1968R20	5	2,0	51	16	5	£18.48
404-2362R02	6	0,2	64	19	6	£23.07
404-2362R025	6	0,25	64	19	6	£23.07
404-2362R05	6	0,5	64	19	6	£23.07
404-2362R075	6	0,75	64	19	6	£23.07
404-2362R08	6	0,8	64	19	6	£23.07
404-2362R10	6	1,0	64	19	6	£23.07
404-2362R125	6	1,25	64	19	6	£23.07
404-2362R15	6	1,5	64	19	6	£23.07
404-2362R20	6	2,0	64	19	6	£23.07
404-3150R02	8	0,2	64	21	8	£27.32
404-3150R025	8	0,25	64	21	8	£27.32
404-3150R03	8	0,3	64	21	8	£27.32
404-3150R05	8	0,5	64	21	8	£27.32
404-3150R075	8	0,75	64	21	8	£27.32
404-3150R08	8	0,8	64	21	8	£27.32
404-3150R10	8	1,0	64	21	8	£27.32
404-3150R125	8	1,25	64	21	8	£27.32
404-3150R15	8	1,5	64	21	8	£27.32
404-3150R20	8	2,0	64	21	8	£27.32
404-3150R25	8	2,5	64	21	8	£27.32

◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	◎	◎	◎	◎	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○				○				





EDP	Dimensions					Price
	D	R	L	l	d	
404-3150R30	8	3,0	64	21	8	£27.32
404-3937R02	10	0,2	70	25	10	£34.53
404-3937R025	10	0,25	70	25	10	£34.53
404-3937R04	10	0,4	70	25	10	£34.53
404-3937R05	10	0,5	70	25	10	£34.53
404-3937R08	10	0,8	70	25	10	£34.53
404-3937R10	10	1,0	70	25	10	£34.53
404-3937R15	10	1,5	70	25	10	£34.53
404-3937R20	10	2,0	70	25	10	£34.53
404-3937R25	10	2,5	70	25	10	£34.53
404-3937R30	10	3,0	70	25	10	£34.53
404-3937R32	10	3,2	70	25	10	£34.53
404-3937R40	10	4,0	70	25	10	£34.53
404-4724R02	12	0,2	76	25	12	£53.67
404-4724R025	12	0,25	76	25	12	£53.67
404-4724R03	12	0,3	76	25	12	£53.67
404-4724R05	12	0,5	76	25	12	£53.67
404-4724R075	12	0,75	76	25	12	£53.67
404-4724R08	12	0,8	76	25	12	£53.67
404-4724R10	12	1,0	76	25	12	£53.67
404-4724R15	12	1,5	76	25	12	£53.67
404-4724R20	12	2,0	76	25	12	£53.67
404-4724R25	12	2,5	76	25	12	£53.67
404-4724R30	12	3,0	76	25	12	£53.67
404-4724R32	12	3,2	76	25	12	£53.67
404-4724R40	12	4,0	76	25	12	£53.67
404-6299R05	16	0,5	89	32	16	£87.07
404-6299R10	16	1,0	89	32	16	£87.07
404-6299R15	16	1,5	89	32	16	£87.07
404-6299R20	16	2,0	89	32	16	£87.07
404-6299R25	16	2,5	89	32	16	£87.07
404-6299R30	16	3,0	89	32	16	£87.07
404-6299R40	16	4,0	89	32	16	£87.07
404-6299R50	16	5,0	89	32	16	£87.07
404-7874R05	20	0,5	102	38	20	£110.50
404-7874R10	20	1,0	102	38	20	£110.50
404-7874R20	20	2,0	102	38	20	£110.50
404-7874R30	20	3,0	102	38	20	£110.50
404-7874R50	20	5,0	102	38	20	£110.50

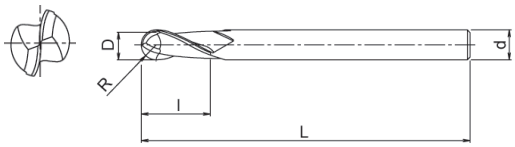
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	◎	◎	◎	◎	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○				○				

HYP-EBD / HYP-EBD-XCEED

- 2 flutes, regular, ball end, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright / TiALN Coated

Icon key page 2



HYP-EBD (Bright)		HYP-EBD-XCEED (TiALN coated)		Dimensions			
EDP	Price	EDP	Price	D	L	l	d
402-0394-BN	£11.26	402-0394-BN11	£19.00	1	39	3	3
402-0591-BN	£7.27	402-0591-BN11	£15.00	1,5	39	5	3
402-0787-BN	£7.98	402-0787-BN11	£15.71	2	39	7	3
402-0984-BN	£7.27	402-0984-BN11	£15.00	2,5	39	8	3
402-1181-BN	£7.27	402-1181-BN11	£15.00	3	39	10	3
402-1378-BN	£10.02	402-1378-BN11	£17.76	3,5	51	12	4
402-1575-BN	£10.45	402-1575-BN11	£18.19	4	51	14	4
402-1772-BN	£11.08	402-1772-BN11	£18.81	4,5	51	14	5
402-1968-BN	£11.08	402-1968-BN11	£18.81	5	51	16	5
402-2362-BN	£13.23	402-2362-BN11	£20.98	6	64	19	6
402-2756-BN	£15.77	402-2756-BN11	£25.17	7	64	19	8
402-3150-BN	£15.38	402-3150-BN11	£24.79	8	64	21	8
402-3543-BN	£17.67	402-3543-BN11	£27.07	9	70	22	10
402-3937-BN	£20.72	402-3937-BN11	£30.12	10	70	25	10
402-4331-BN	£28.41	402-4331-BN11	£39.55	11	70	25	11
402-4724-BN	£34.09	402-4724-BN11	£45.24	12	76	25	12
402-5512-BN	£47.91	402-5512-BN11	£59.05	14	89	30	14
402-6299-BN	£58.76	402-6299-BN11	£75.33	16	89	32	16
402-7087-BN	£75.87	402-7087-BN11	£92.43	18	102	35	18
402-7874-BN	£86.08	402-7874-BN11	£108.17	20	102	38	20
402-8661-BN	£146.71	402-8661-BN11	£174.31	22	102	38	22
402-9843-BN	£159.44	402-9843-BN11	£187.05	25	102	38	25

HYP-EBD (uncoated)

◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	○	○	○	○	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○								

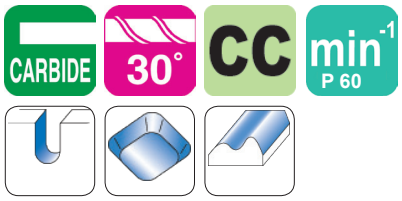
HYP-EBD-XCEED (coated)

◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	◎	◎	◎	◎	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○				○				

HYP-EBDL

- 2 flutes, long, ball end, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright



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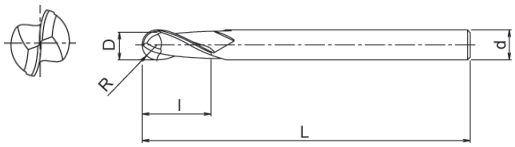


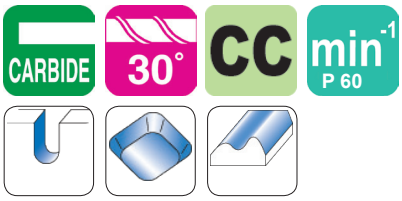
EDP	Dimensions				Price
	D	L	l	d	
462-1181-BN	3	57	19	3	£13.74
462-1575-BN	4	57	19	4	£15.28
462-1968-BN	5	64	25	5	£15.75
462-2362-BN	6	76	28	6	£20.20
462-3150-BN	8	76	29	8	£24.81
462-3937-BN	10	76	32	10	£31.51
462-4724-BN	12	102	51	12	£57.53
462-5512-BN	14	127	57	14	£90.53
462-6299-BN	16	127	57	16	£110.40
462-7087-BN	18	127	57	18	£126.96
462-7874-BN	20	127	57	20	£162.23
462-9843-BN	25	127	57	25	£288.08

◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	○	○	○	○	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○								

HYP-EBDXL

- 2 flutes, extra long, ball end, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright



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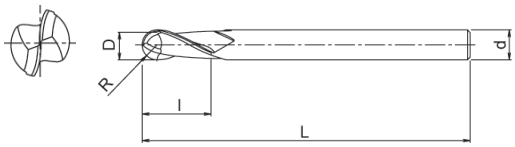


EDP	Dimensions				Price
	D	L	l	d	
482-1181-BN	3	76	25	3	£14.57
482-1575-BN	4	76	28	4	£15.75
482-1968-BN	5	76	32	5	£17.13
482-2362-BN	6	102	38	6	£22.88
482-3150-BN	8	102	42	8	£29.07
482-3937-BN	10	102	45	10	£37.65
482-4724-BN	12	153	76	12	£84.91
482-5512-BN	14	153	76	14	£115.82
482-6299-BN	16	153	76	16	£141.66
482-7087-BN	18	153	76	18	£162.91
482-7874-BN	20	153	76	20	£176.16
482-9843-BN	25	153	76	25	£319.03

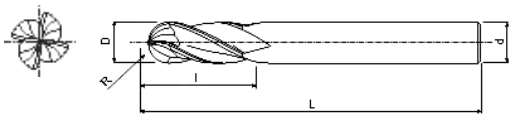
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	○	○	○	○	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○								

HYP-EBM / HYP-EBM-XCEED

- 4 flutes, regular, ball end, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright / TiALN Coated

Icon key page 2



Bright

HYP-EBM	
EDP	Price
404-0394-BN	£11.26
404-0591-BN	£7.27
404-0787-BN	£7.98
404-0984-BN	£7.27
404-1181-BN	£7.27
404-1378-BN	£10.02
404-1575-BN	£10.45
404-1772-BN	£11.08
404-1968-BN	£11.08
404-2362-BN	£13.23
404-2756-BN	£15.77
404-3150-BN	£15.38
404-3543-BN	£17.67
404-3937-BN	£20.72
404-4331-BN	£28.41
404-4724-BN	£34.09
404-5512-BN	£47.91
404-6299-BN	£58.76
404-7087-BN	£75.87
404-7874-BN	£86.08
404-8661-BN	£146.71
404-9843-BN	£159.44

TiALN coated

HYP-EBM-XCEED	
EDP	Price
404-0394-BN11	£19.00
404-0591-BN11	£15.00
404-0787-BN11	£15.71
404-0984-BN11	£15.00
404-1181-BN11	£15.00
404-1378-BN11	£17.76
404-1575-BN11	£18.19
404-1772-BN11	£18.81
404-1968-BN11	£18.81
404-2362-BN11	£20.98
404-2756-BN11	£25.17
404-3150-BN11	£24.79
404-3543-BN11	£27.07
404-3937-BN11	£30.12
404-3331-BN11	£39.55
404-4724-BN11	£45.24
404-5512-BN11	£59.05
404-6299-BN11	£75.33
404-7087-BN11	£92.43
404-7874-BN11	£108.17
404-8661-BN11	£174.31
404-9843-BN11	£187.05

Dimensions			
D	L	l	d
1	39	3	3
1,5	39	5	3
2	39	7	3
2,5	39	8	3
3	39	10	3
3,5	51	12	4
4	51	14	4
4,5	51	14	5
5	51	16	5
6	64	19	6
7	64	19	8
8	64	21	8
9	70	22	10
10	70	25	10
11	70	25	11
12	76	25	12
14	89	30	14
16	89	32	16
18	102	35	18
20	102	38	20
22	102	38	22
25	102	38	25

HYP-EBM (uncoated)

◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	○	○	○	○	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○								

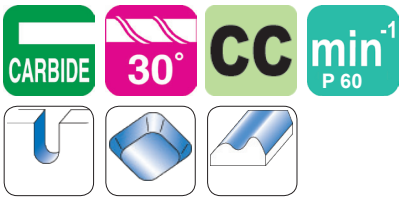
HYP-EBM-XCEED (coated)

◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	◎	◎	◎	◎	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○				○				

HYP-EBML

- 4 flutes, long, ball end, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright



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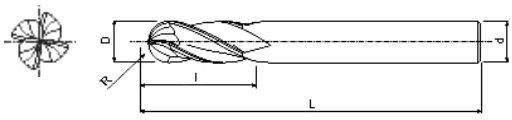


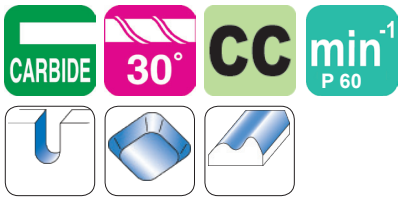
EDP	Dimensions				Price
	D	L	l	d	
464-1181-BN	3	57	19	3	£13.74
464-1575-BN	4	57	19	4	£15.28
464-1968-BN	5	64	25	5	£15.75
464-2362-BN	6	76	28	6	£20.20
464-3150-BN	8	76	29	8	£24.81
464-3937-BN	10	76	32	10	£31.51
464-4724-BN	12	102	51	12	£57.53
464-5512-BN	14	127	57	14	£90.53
464-6299-BN	16	127	57	16	£110.40
464-7087-BN	18	127	57	18	£126.96
464-7874-BN	20	127	57	20	£143.71
464-9843-BN	25	127	57	25	£288.08

◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	○	○	○	○	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○								

HYP-EBMXL

- 4 flutes, extra long, ball end, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright



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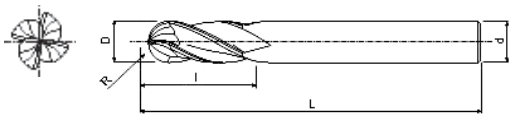


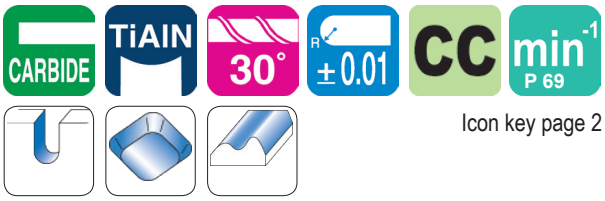
EDP	Dimensions				Price
	D	L	l	d	
484-1181-BN	3	76	25	3	£14.57
484-1575-BN	4	76	28	4	£15.75
484-1968-BN	5	76	32	5	£17.13
484-2362-BN	6	102	38	6	£22.88
484-3150-BN	8	102	42	8	£29.07
484-3937-BN	10	102	45	10	£37.65
484-4724-BN	12	153	76	12	£84.91
484-5512-BN	14	153	76	14	£115.82
484-6299-BN	16	153	76	16	£141.66
484-7087-BN	18	153	76	18	£162.91
484-7874-BN	20	153	76	20	£176.16
484-9843-BN	25	153	76	25	£319.03

◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	○	○	○	○	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				○								

HYP-SB-EBD

- 2 flutes, regular, ball end, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : TiALN Coated



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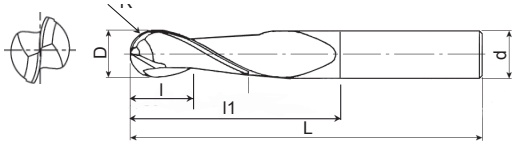
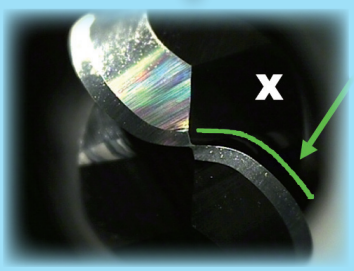


EDP	Dimensions					Price
	D	L	l	l1	d	
48350030	3	57	4	9	6	£36.02
48350040	4	57	5	12	6	£36.02
48350050	5	57	6	15	6	£36.02
48350060	6	57	7	18	6	£44.31
48350080	8	63	9	20	8	£47.38
48350100	10	72	11	25	10	£69.07
48351200	12	83	13	25	12	£91.08

HY-PRO

Technical

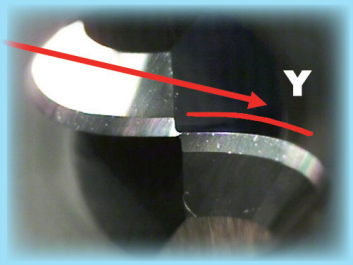


HYP-SB-EBD
Long cutting edge

Less	torque
Less	heat build up
Better	surface finish
Longer	tool life

Standard Geometry
Short cutting edge

Normal	torque
Normal	heat build up
Average	surface finish
Standard	tool life



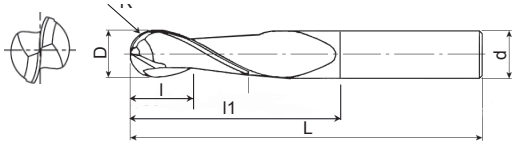
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
◎	◎	◎	◎	◎	◎	◎		○	○		◎	◎
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
○				○								

HYP-Ti-EBD

- 2 flutes, regular, ball end, for titanium and difficult applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : TiALN Coated

Icon key page 2



EDP	Dimensions					Price
	D	L	l	l1	d	
430-7215	3	75	5	9	6	£41.61
430-7216	4	75	6	15	6	£39.38
430-7217	5	75	7	18	6	£37.33
430-7218	6	100	8	18	6	£38.38
430-7219	8	100	10	20	8	£49.04
430-7220	10	100	12	25	10	£80.79
430-7221	12	100	16	25	12	£92.75

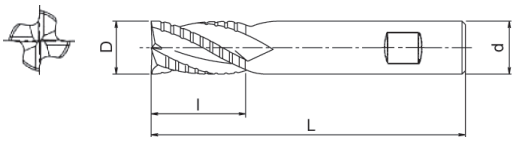
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
				◎	◎	○			○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
								◎	○			

HYP-HP-(W)RESF

- 4 flutes, regular, roughing, for general applications
- Shank : FS (with flat)
- Material : MG (micro grain carbide)
- Surface treatment : TiALN Coated

Icon key page 2



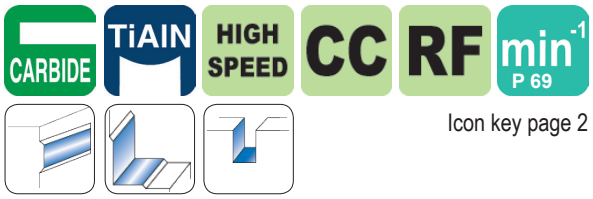
EDP	Dimensions				Price
	D	L	l	d	
48624060	6	64	19	6	£23.73
48624080	8	64	21	8	£37.19
48624100	10	70	22	10	£48.52
48624120	12	76	25	12	£61.74
48625160	16	89	32	16	£103.69
48626200	20	102	38	20	£166.41
48626250	25	102	38	25	£395.37

◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
◎	◎	◎	◎	◎	○			○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP

HYP-HS-CRE

- 4 flutes, regular, corner radius, low speed high feed
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : TiALN Coated



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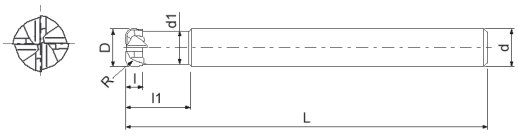


EDP	Dimensions							Price
	D	R	L	l	l1	d1	d	
48340060	6	1,5	57	2,5	24	5	6	£30.18
48340080	8	2,0	63	3,5	32	7	8	£36.12
48340100	10	2,0	72	4	40	9	10	£45.49
48340120	12	3,0	83	5	48	11	12	£54.96

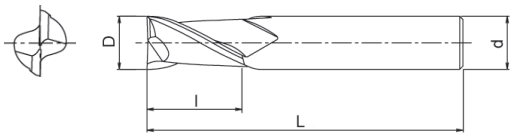
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
◎	◎	◎	◎	◎	◎	◎	○				◎	◎
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP

HYP-AL-EDS

- 2 flutes, regular, centre cutting, for aluminium
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright

Icon key page 2

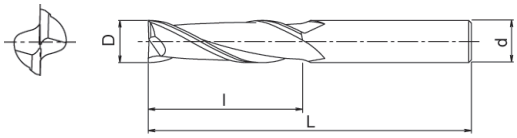


EDP	Dimensions				Price
	D	L	l	d	
440-2362	6	64	19	6	£25.77
440-3150	8	64	21	8	£26.42
440-3937	10	70	25	10	£35.91
440-4724	12	76	25	12	£58.62
440-6299	16	89	32	16	£90.35
440-7874	20	102	38	20	£133.24
440-9843	25	127	57	25	£166.55

HYP-AL-EDL

- 2 flutes, long, centre cutting, for aluminium
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright

Icon key page 2



EDP	Dimensions				Price
	D	L	l	d	
440-2363	6	102	38	6	£39.46
440-3151	8	102	41	8	£43.51
440-3938	10	102	51	10	£58.62
440-4725	12	102	51	12	£76.84
440-6300	16	127	57	16	£146.65
440-7875	20	127	57	20	£166.55
440-9844	25	152	76	25	£368.95

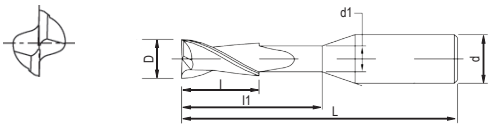
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
◎				◎						○		

HYP-AL-LS-EDS

- 2 flutes, long (with neck), centre cutting, for aluminium
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright

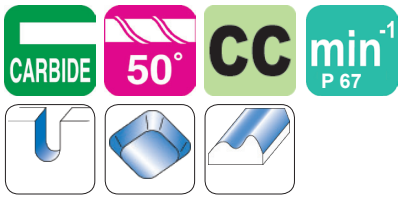
Icon key page 2



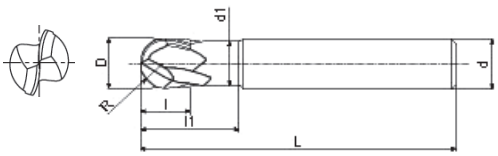
EDP	Dimensions						Price
	D	L	l	l1	d1	d	
430-7222	3	75	3	12	2,8	6	£40.29
430-7223	4	75	4	15	3,8	6	£40.13
430-7224	5	75	5	20	4,8	6	£40.29
430-7225	6	100	6	20	5,8	6	£41.61
430-7226	8	100	8	25	7,8	8	£54.00
430-7227	10	100	10	25	9,8	10	£80.77
430-7228	12	100	12	40	11,8	12	£97.26

HYP-AL-LS-EBD

- 2 flutes, long (with neck), ball end, for aluminium
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright



Icon key page 2



EDP	Dimensions						Price
	D	L	l	l1	d1	d	
430-7229	3	75	5	9	2,8	6	£40.31
430-7230	4	75	6	15	3,8	6	£40.31
430-7231	5	75	7	18	4,8	6	£40.31
430-7232	6	100	8	20	5,8	6	£43.19
430-7233	8	100	10	25	7,8	8	£55.81
430-7234	10	100	12	30	9,8	10	£84.88
430-7235	12	100	16	40	11,8	12	£97.28

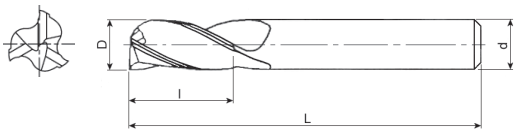
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
◎				◎						○		

HYP-ACE-STUB

- 3 flutes, short, centre cutting, for aluminium
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright

Icon key page 2

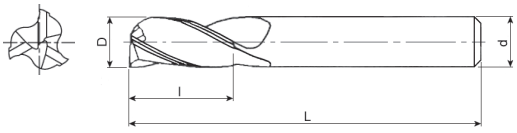


EDP	Dimensions				Price
	D	L	l	d	
475-1181	3	38	4,5	6	£14.30
475-1575	4	51	6	6	£19.65
475-2362	6	64	9	6	£26.51
475-3150	8	64	12	8	£28.67
475-3937	10	64	15	10	£33.46
475-4724	12	76	18	12	£64.47
475-6299	16	89	24	16	£121.66
475-7874	20	102	30	20	£168.27
475-9843	25	102	37,5	25	£262.46

HYP-ACE-REGULAR

- 3 flutes, regular, centre cutting, for aluminium
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright

Icon key page 2



EDP	Dimensions				Price
	D	L	l	d	
476-1181	3	38	7,5	6	£15.72
476-1575	4	51	10	6	£21.96
476-2362	6	64	15	6	£29.46
476-3150	8	64	20	8	£31.84
476-3937	10	64	25	10	£36.97
476-4724	12	76	30	12	£74.37
476-6299	16	89	40	16	£138.69
476-7874	20	102	50	20	£181.43
476-9843	25	127	62,5	25	£345.09

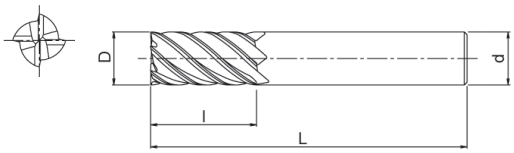
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
◎				◎						○		

HYP-ROCKET-MILL

- 4,6 & 8 flute, regular, finishing, for genral applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : TiALN Coated

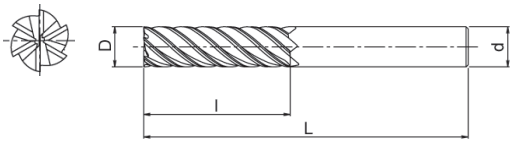
Icon key page 2



EDP	Dimensions					Price
	D	L	l	d	No. Flutes	
HP450-1181	3	51	10	3	4	£17.27
HP450-1575	4	51	14	4	4	£21.05
HP450-1969	5	51	16	5	4	£23.19
HP450-2362	6	64	19	6	6	£28.53
HP450-3150	8	64	21	8	6	£41.27
HP450-3937	10	64	25	10	6	£59.55
HP450-4724	12	76	25	12	6	£80.63
HP450-5512	14	89	30	14	6	£105.18
HP450-6299	16	89	35	16	6	£157.98
HP450-7087	18	102	35	18	6	£171.71
HP450-7874	20	102	38	20	6	£202.54
HP450-8661	22	102	38	22	6	£260.21
HP450-9843	25	102	38	25	8	£339.20

HYP-LS-ROCKET-MILL

- As above, but long series.



EDP	Dimensions					Price
	D	L	l	d	No. Flutes	
HP450L-2362	6	100	26	6	6	£37.92
HP450L-3150	8	100	36	8	6	£54.88
HP450L-3937	10	100	46	10	6	£79.42
HP450L-4724	12	110	56	12	6	£107.06
HP450L-6299	16	130	66	16	6	£209.88
HP450L-7874	20	140	76	20	6	£269.04
HP450L-9843	25	180	92	25	8	£543.53

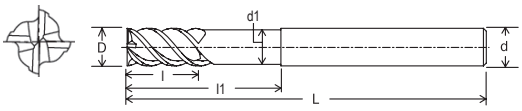
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	○	○	○	○	○	○		○	○		○	○
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
								○	○			

HYP-EHS

- 4 flutes, regular, high helix, for general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : TiALN Coated

Icon key page 2

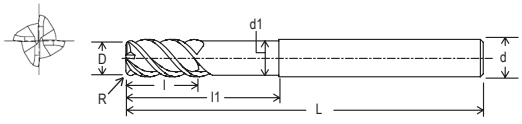


EDP	Dimensions						Price
	D	L	l	l1	d1	d	
HP453-1575	4	60	6	12	3,9	4	£23.13
HP453-2362	6	60	9	18	5,9	6	£32.83
HP453-3150	8	75	12	24	7,9	8	£40.82
HP453-3937	10	80	15	30	9,9	10	£50.98
HP453-4724	12	102	18	36	11,9	12	£77.18
HP453-6299	16	110	24	48	15,9	16	£121.55
HP453-7874	20	125	30	60	19,9	20	£185.17

HYP-CR-EHS

- 4 flutes, regular, corner radius, high helix, general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : TiALN Coated

Icon key page 2



EDP	Dimensions							Price
	D	R	L	l	l1	d1	d	
HP456-2363	6	0.5	60	9	18	5,9	6	£37.76
HP456-2364	6	1.0	60	9	18	5,9	6	£37.76
HP456-3151	8	0.5	75	12	24	7,9	8	£46.96
HP456-3152	8	1.0	75	12	24	7,9	8	£46.96
HP456-3938	10	0.5	80	15	30	9,9	10	£58.62
HP456-3939	10	1.0	80	15	30	9,9	10	£58.62
HP456-4725	12	0.5	102	18	36	11,9	12	£88.74
HP456-4726	12	1.0	102	18	36	11,9	12	£88.74
HP456-4727	12	1.5	102	18	36	11,9	12	£88.74

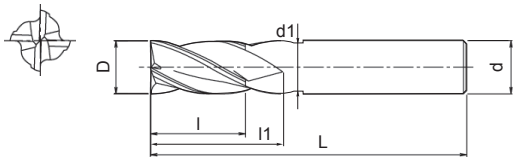
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	○	○	○	○	○			○	○			
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP

HYP-HI-EMS

- 4 flutes, regular, variable lead, for titanium and general applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : TiALN Coated

Icon key page 2

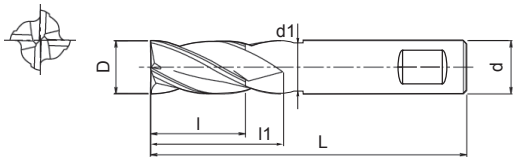


VARIABLE LEAD

EDP	Dimensions						Price
	D	L	l	l1	d1	d	
48320040	4	57	11	-	-	6	£18.13
48320050	5	57	13	-	-	6	£18.13
48320060	6	57	13	20	5,8	6	£22.61
48320080	8	63	19	25	7,8	8	£24.24
48320100	10	72	22	30	9,8	10	£35.32
48320120	12	83	26	38	11,8	12	£46.61
48320160	16	92	32	45	15,8	16	£68.77
48320200	20	104	38	60	19,8	20	£98.43

HYP-HI-(W)EMS

- As above, but with flated shank.

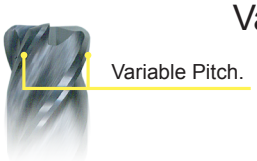


VARIABLE LEAD

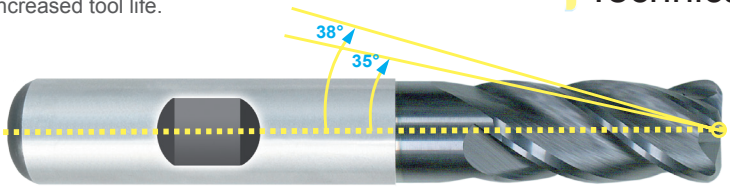
EDP	Dimensions						Price
	D	L	l	l1	d1	d	
483200401	4	57	11	-	-	6	£18.13
483200501	5	57	13	-	-	6	£18.13
483200601	6	57	13	20	5,8	6	£22.61
483200801	8	63	19	25	7,8	8	£24.24
483201001	10	72	22	30	9,8	10	£35.32
483201201	12	83	26	38	11,8	12	£46.61
483201601	16	92	32	45	15,8	16	£68.77
483202001	20	104	38	60	19,8	20	£98.43

Carbide end mills incorporating new variable helix flute design for better balance, resulting in a superb surface finish. TIALN multi layered coating for increased tool life.

Technical



Variable Lead.



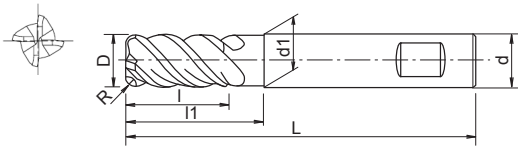
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
◎	◎	◎	◎	◎	◎	○		◎	◎		◎	◎
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
								◎	◎			

HYP-CR-HI (W)EMS

- 4 flutes, regular, corner radius, variable lead, for titanium and general applications
- Shank : FS (with flat)
- Material : MG (micro grain carbide)
- Surface treatment : TiALN Coated

Icon key page 2



VARIABLE LEAD

EDP	Dimensions							Price
	D	R	L	l	l1	d1	d	
4832004011	4	0,5	57	11	-	-	6	£20.97
4832005011	5	0,5	57	13	-	-	6	£20.97
4832006011	6	0,5	57	13	20	5,8	6	£26.21
4832006012	6	1,0	57	13	20	5,8	6	£26.21
4832006013	6	1,5	57	13	20	5,8	6	£26.21
4832006014	6	2,0	57	13	20	5,8	6	£26.21
4832008011	8	0,5	63	19	25	7,8	8	£20.16
4832008012	8	1,0	63	19	25	7,8	8	£20.16
4832008013	8	1,5	63	19	25	7,8	8	£20.16
4832008014	8	2,0	63	19	25	7,8	8	£20.16
4832010011	10	0,5	72	22	30	9,8	10	£40.96
4832010012	10	1,0	72	22	30	9,8	10	£40.96
4832010013	10	1,5	72	22	30	9,8	10	£40.96
4832010014	10	2,0	72	22	30	9,8	10	£40.96
4832010016	10	3,0	72	22	30	9,8	10	£40.96
4832012011	12	0,5	83	26	38	11,8	12	£55.60
4832012012	12	1,0	83	26	38	11,8	12	£55.60
4832012013	12	1,5	83	26	38	11,8	12	£55.60
4832012014	12	2,0	83	26	38	11,8	12	£55.60
4832012016	12	3,0	83	26	38	11,8	12	£55.60
4832016011	16	0,5	92	32	45	15,8	16	£81.97
4832016012	16	1,0	92	32	45	15,8	16	£81.97
4832016014	16	2,0	92	32	45	15,8	16	£81.97
4832016016	16	3,0	92	32	45	15,8	16	£81.97
4832016018	16	4,0	92	32	45	15,8	16	£81.97
4832020012	20	1,0	104	38	60	19,8	20	£120.86
4832020014	20	2,0	104	38	60	19,8	20	£120.86
4832020016	20	3,0	104	38	60	19,8	20	£120.86
4832020018	20	4,0	104	38	60	19,8	20	£120.86
4832020020	20	5,0	104	38	60	19,8	20	£120.86

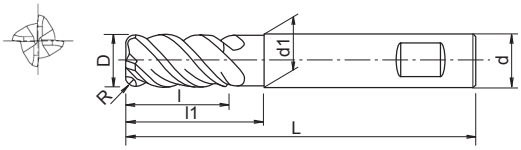
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
◎	◎	◎	◎	◎	◎	○		◎	◎		◎	◎
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
								◎	◎			

HYP-CR-HD-(W)EMS

- 4 flutes, regular, corner radius, variable lead, for titanium and general applications
- Shank : FS (with flat)
- Material : MG (micro grain carbide)
- Surface treatment : TiALN Coated

Icon key page 2



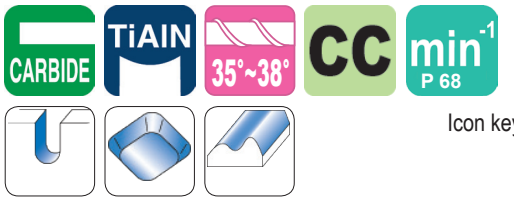
VARIABLE LEAD

EDP	Dimensions							Price
	D	R	L	l	l1	d1	d	
4833006010	6	0,25	57	13	20	5,8	6	£26.21
4833008010	8	0,25	63	19	25	7,8	8	£20.16
4833010010	10	0,25	72	22	30	9,8	10	£40.96
4833012010	12	0,25	83	26	38	11,8	12	£55.60
4833016010	16	0,25	92	32	45	15,8	16	£81.97
4833020010	20	0,25	104	38	60	19,8	20	£120.86

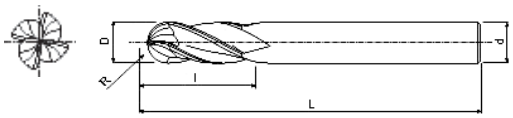
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
◎	◎	◎	◎	◎	◎	○		◎	◎		◎	◎
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
								◎	◎			

- 4 flutes, regular, ball end, variable lead, for titanium and other difficult applications
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : TiALN Coated



Icon key page 2



VARIABLE LEAD

EDP	Dimensions				Price
	D	L	l	d	
430-7916	3	39	10	3	£14.72
430-7917	4	51	14	4	£17.32
430-7918	5	51	16	5	£21.32
430-7919	6	64	19	6	£25.49
430-7920	8	64	21	8	£34.18
430-7921	10	70	25	10	£51.68
430-7922	12	76	26	12	£64.35

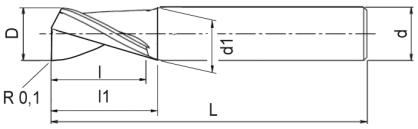
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
○	◎	◎	◎	◎	○	○		◎	○			
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
								◎	◎			

HYP-F1

- Single flute, short, centre cutting, for aluminium and plastics
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Bright

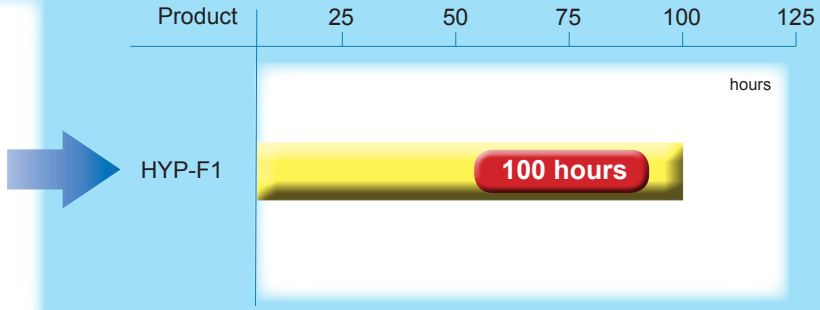
Icon key page 2



EDP	Dimensions						Price
	D	L	l	l1	d1	d	
48360030	3	40	4	5	-	6	£28.32
48360040	4	50	5	6	-	6	£28.32
48360050	5	50	7	8	-	6	£31.64
48360060	6	50	8	15	5,4	6	£31.64
48360080	8	60	11	20	7	8	£44.14
48360100	10	70	13	25	9	10	£62.14
48360120	12	70	15	30	11	12	£72.75

Technical

Work Material	Aluminium
Tool Diameter	6,0mm
ae	6,0mm
ap (depth of cut)	2,0mm
Cutting Speed	24,000 min^{-1}
Feed	4,000 mm/min
Coolant	Air
Machine	Verical



Processing examples

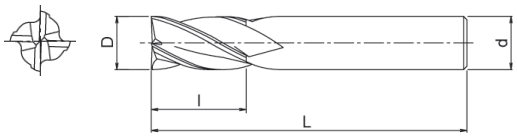
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
				◎						◎		

HYP-EMS-(DIAMOND)

- 4 flutes, regular, centre cutting, for plastic and graphite
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Diamond Coated

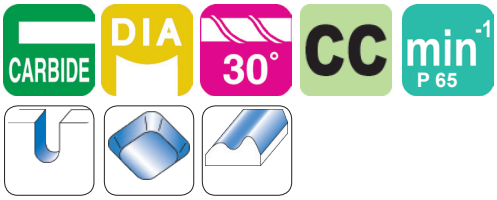
Icon key page 2

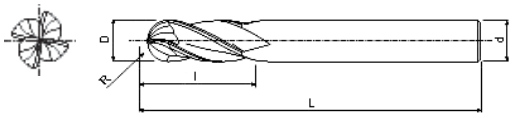


EDP	Dimensions				Price
	D	L	l	d	
404-0787DIA	2	39	7	3	£27.90
404-1181DIA	3	39	10	3	£27.12
404-1378DIA	3.5	51	12	4	£43.23
404-1575DIA	4	51	14	4	£43.69
404-1968DIA	5	51	16	5	£52.64
404-2362DIA	6	64	19	6	£59.77
404-3150DIA	8	64	21	8	£84.20
404-3937DIA	10	70	25	10	£100.34
404-4724DIA	12	76	25	12	£125.89
404-6299DIA	16	89	32	16	£183.97
404-7874DIA	20	102	38	20	£243.62

HYP-EBM-(DIAMOND)

- 4 flutes, regular, ball end, for plastic & graphite
- Shank : NS (without flat)
- Material : MG (micro grain carbide)
- Surface treatment : Diamond Coated





EDP	Dimensions				Price
	D	L	l	d	
404-1181-BNDIA	3	39	10	3	£27.99
404-1575-BNDIA	4	51	14	4	£44.88
404-2362-BNDIA	6	64	19	6	£61.26
404-2756-BNDIA	7	64	19	8	£86.25
404-3937-BNDIA	10	70	25	10	£102.57

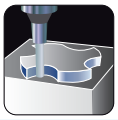
◎ EXCELLENT ○ GOOD

Work Material												
C<0,2%	0,25<C<0,4%	C>0,45%	Alloy Steels	25~35 HRC	35~45 HRC	45~52 HRC	52~62 HRC	Stainless	Tool Steel	SC	Cast Iron	Ductile
Copper	Brass	BsC	PB	Aluminium	Cast Al	MC	Zinc Alloy	Titanium	Ni Alloys	Plastic	Graphite	CFRP
○				◎	○					◎	◎	

MILLING CONDITIONS

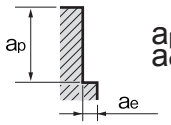
2 flute and 3 flute carbide end mill (see notes below for long series & coated)

SIDE MILLING



	Aluminium		Cast Iron		Mild Steels Carbon Steels		HYP-EDS,ETS,EDL,EDXL Pre-hardened Steels Die & Alloy Steels				Hardened Steels	
			< 180 HB		< 180 HB		< 30 HRC		< 40 HRC		< 50 HRC	
Vc	100 ~ 120 m/min		30 ~ 45 m/min		30 ~ 45 m/min		25 ~ 35 m/min		25 ~ 35 m/min		15 m/min	
ø	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**
1	31,500	450	14,000	175	11,000	85	8,000	60	8,000	35	4,800	14
1.5	21,200	450	9,500	175	7,500	85	5,300	60	5,400	35	3,200	14
2	16,000	450	7,100	250	5,500	85	4,000	60	4,000	35	2,400	14
3	12,500	450	4,750	300	4,500	150	3,550	120	3,150	45	1,600	25
4	9,500	475	3,550	300	3,550	175	2,650	120	2,360	45	1,200	25
5	7,500	475	2,800	300	2,800	200	2,120	125	1,900	45	950	25
6	6,300	475	2,360	300	2,360	200	1,700	125	1,600	45	800	25
8	4,750	500	1,800	300	1,800	200	1,320	125	1,180	45	600	25
10	3,750	500	1,400	315	1,400	225	1,060	125	950	45	480	25
12	3,150	560	1,180	315	1,180	225	850	125	800	45	400	25
16	2,360	560	900	375	900	250	670	140	600	45	300	25
20	1,900	560	710	375	710	250	530	150	475	45	240	25
25	1,500	500	560	375	560	250	425	140	375	35	190	20

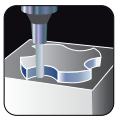
Maximum depth of cut



ap=1.5D
ae=0.1D

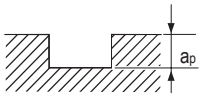
(1) Reduce speeds & feeds 20-30% for HYP-EDL (Long series).
(2) Reduce speeds & feeds 40-50% for HYP-EDXL. (Extra long series).
(3) Increase speeds & feeds 20-30% for HYP-EDS-XCEED (coated).
(4) Column for Hardened Steels (40-50 HRC) is for XCEED coated tools only.
(5) Increase speeds & feeds 20-30% for HYP-ETS.
(6) Increase speeds & feeds 20-40% for HYP-ETS-XCEED (coated).

SLOTTING



	Aluminium		Cast Iron		Mild Steels Carbon Steels		HYP-EDS,ETS,EDL,EDXL Pre-hardened Steels Die & Alloy Steels				Hardened Steels	
			< 180 HB		< 180 HB		< 30 HRC		< 40 HRC		< 50 HRC	
Vc	100 ~ 120 m/min		30 ~ 45 m/min		30 ~ 45 m/min		25 ~ 35 m/min		25 ~ 35 m/min		15 m/min	
ø	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**
1	31,500	200	14,000	140	12,500	75	7,500	30	7,000	15	4,800	8
1.5	21,200	200	9,500	140	8,500	90	6,500	35	5,000	20	3,200	11
2	16,000	300	7,100	150	6,300	100	5,000	60	4,000	30	2,400	16
3	11,200	300	4,750	160	4,250	100	3,200	80	2,600	30	1,600	16
4	8,000	300	3,550	160	3,150	100	2,400	80	2,000	30	1,200	16
5	6,300	300	2,800	160	2,500	100	2,000	80	1,600	30	950	16
6	5,300	300	2,360	200	2,120	100	1,600	80	1,300	30	800	16
8	4,000	300	1,800	236	1,600	100	1,200	80	1,000	30	600	16
10	3,150	300	1,400	236	1,250	100	1,000	80	800	30	480	16
12	2,650	300	1,180	236	1,060	100	820	80	700	30	400	16
16	2,000	300	900	236	800	100	640	85	500	37	300	12
20	1,600	300	710	236	630	100	500	85	400	37	240	10
25	1,250	300	560	236	500	100	400	85	320	37	190	8

Maximum depth of cut



D < 2	0.5D
2 < D	1D

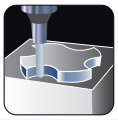
(1) Reduce speeds & feeds 20-30% for HYP-EDL (Long series).
(2) Reduce speeds & feeds 40-50% for HYP-EDXL. (Extra long series).
(3) Increase speeds & feeds 20-30% for HYP-EDS-XCEED (coated).
(4) Column for Hardened Steels (40-50 HRC) is for XCEED coated tools only.
(5) Increase speeds & feeds 20-30% for HYP-ETS.
(6) Increase speeds & feeds 20-40% for HYP-ETS-XCEED (coated).

MILLING CONDITIONS

4 flute carbide end mill (see notes below for long series & coated)

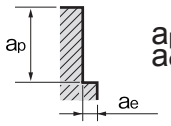
SIDE MILLING

HYP-EMS,CR-EMS,EML,EMXL



	Aluminium		Cast Iron		Mild Steels Carbon Steels		Pre-hardened Steels Die & Alloy Steels				Hardened Steels	
			< 180 HB		< 180 HB		< 30 HRC		< 40 HRC		< 50 HRC	
Vc	100 ~ 120 m/min		30 ~ 45 m/min		30 ~ 45 m/min		25 ~ 35 m/min		25 ~ 35 m/min		15 m/min	
ø	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**
1	31,500	630	14,000	245	11,000	120	8,000	85	8,000	50	4,800	20
1.5	21,200	630	9,500	245	7,500	120	5,300	85	5,400	50	3,200	20
2	16,000	630	7,100	350	5,500	120	4,000	85	4,000	50	2,400	20
3	12,500	630	4,750	420	4,500	210	3,550	170	3,150	63	1,600	35
4	9,500	665	3,550	420	3,550	245	2,650	170	2,360	63	1,200	35
5	7,500	665	2,800	420	2,800	280	2,120	170	1,900	63	950	35
6	6,300	665	2,360	420	2,360	280	1,700	170	1,600	63	800	35
8	4,750	700	1,800	420	1,800	280	1,320	170	1,180	63	600	35
10	3,750	700	1,400	440	1,400	310	1,060	170	950	63	480	35
12	3,150	780	1,180	440	1,180	310	850	170	800	63	400	35
16	2,360	780	900	525	900	350	670	200	600	63	300	35
20	1,900	780	710	525	710	350	530	200	475	63	240	35
25	1,500	700	560	525	560	350	425	200	375	50	190	28

Maximum depth of cut

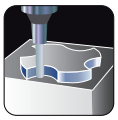


ap=1.5D
ae=0.1D

(1) Reduce speeds & feeds 20-30% for HYP-EML (Long series).
(2) Reduce speeds & feeds 40-50% for HYP-EMXL. (Extra long series).
(3) Increase speeds & feeds 20-30% for HYP-EMS-XCEED (coated).
(4) Column for Hardened Steels (40-50 HRC) is for XCEED coated tools only.

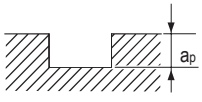
SLOTTING

HYP-EMS,CR-EMS,EML



	Aluminium		Cast Iron		Mild Steels Carbon Steels		Pre-hardened Steels Die & Alloy Steels				Hardened Steels	
			< 180 HB		< 180 HB		< 30 HRC		< 40 HRC		< 50 HRC	
Vc	100 ~ 120 m/min		30 ~ 45 m/min		30 ~ 45 m/min		25 ~ 35 m/min		25 ~ 35 m/min		15 m/min	
ø	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**
1	31,500	280	14,000	200	12,500	105	7,500	42	7,000	20	4,800	10
1.5	21,200	280	9,500	200	8,500	125	6,500	50	5,000	28	3,200	15
2	16,000	420	7,100	210	6,300	140	5,000	85	4,000	42	2,400	22
3	11,200	420	4,750	225	4,250	140	3,200	110	2,600	42	1,600	22
4	8,000	420	3,550	225	3,150	140	2,400	110	2,000	42	1,200	22
5	6,300	420	2,800	225	2,500	140	2,000	110	1,600	42	950	22
6	5,300	420	2,360	280	2,120	140	1,600	110	1,300	42	800	22
8	4,000	420	1,800	330	1,600	140	1,200	110	1,000	42	600	22
10	3,150	420	1,400	330	1,250	140	1,000	110	800	42	480	22
12	2,650	420	1,180	330	1,060	140	820	110	700	42	400	22
16	2,000	420	900	330	800	140	640	120	500	50	300	17
20	1,600	420	710	330	630	140	500	120	400	50	240	14
25	1,250	420	560	330	500	140	400	120	320	50	190	11

Maximum depth of cut



D < 2	0.3D
2 < D	0.5D

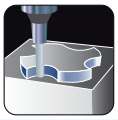
(1) Reduce speeds & feeds 20-30% for HYP-EML (Long series).
(2) Reduce speeds & feeds 40-50% for HYP-EMXL. (Extra long series).
(3) Increase speeds & feeds 20-30% for HYP-EMS-XCEED (coated).
(4) Column for Hardened Steels (40-50 HRC) is for XCEED coated tools only.
(5) Slotting is not recommended for HYP-EMXL.

MILLING CONDITIONS

2 flute ball nose carbide end mill (see notes below for long series & coated)

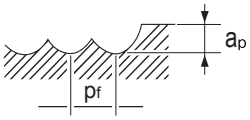
PROFILING

HYP-EDB,EBDL,EBDXL



	Aluminium		Cast Iron		Mild Steels Carbon Steels		Pre-hardened Steels Die & Alloy Steels				Hardened Steels	
			< 180 HB		< 180 HB		< 30 HRC		< 40 HRC		< 50 HRC	
Vc	100 m/min		35 m/min		35 m/min		25 m/min		20 m/min		15 m/min	
ø	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**
1	32,000	190	11,000	90	11,000	80	8,000	45	6,400	26	4,800	24
2	16,000	190	5,600	90	5,600	80	4,000	45	3,200	26	2,387	24
3	10,000	190	3,700	100	3,700	90	2,600	50	2,100	35	2,000	30
4	8,000	190	2,800	100	2,800	90	2,000	50	1,600	35	1,195	30
5	6,400	190	2,200	100	2,200	90	1,600	50	1,300	35	955	30
6	5,300	190	1,900	100	1,900	90	1,320	50	1,000	35	800	30
8	4,000	220	1,400	100	1,400	90	1,000	50	800	35	600	30
10	3,200	220	1,100	100	1,100	90	800	50	640	35	475	30
12	2,600	220	930	100	930	90	660	50	530	35	400	30
16	2,000	220	700	100	700	90	500	50	400	35	300	30
20	1,600	220	560	100	560	90	400	50	320	35	240	30
25	1,200	220	450	100	450	90	320	50	250	35	190	30

Maximum depth of cut



a_p=0.3D

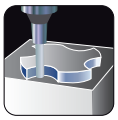
p_f=0.7D

(1) Reduce speeds & feeds 20-30% for HYP-EBDL (Long series).
(2) Reduce speeds & feeds 40-50% for HYP-EBDXL. (Extra long series).
(3) Increase speeds & feeds 20-30% for HYP-EBD-XCEED (coated).
(4) Column for Hardened Steels (40-50 HRC) is for XCEED coated tools only.

4 flute ball nose carbide end mill (see notes below for long series & coated)

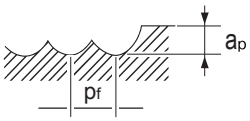
PROFILING

HYP-EBM,EBML,EBMXL



	Aluminium		Cast Iron		Mild Steels Carbon Steels		Pre-hardened Steels Die & Alloy Steels				Hardened Steels	
			< 180 HB		< 180 HB		< 30 HRC		< 40 HRC		< 50 HRC	
Vc	100 m/min		35 m/min		35 m/min		25 m/min		20 m/min		15 m/min	
ø	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**
1	32,000	226	11,000	126	11,000	112	8,000	63	6,400	43	4,800	34
2	16,000	226	5,600	126	5,600	112	4,000	63	3,200	43	2,387	34
3	10,000	226	3,700	140	3,700	126	2,600	70	2,100	50	2,000	42
4	8,000	226	2,800	140	2,800	126	2,000	70	1,600	50	1,195	42
5	6,400	226	2,200	140	2,200	126	1,600	70	1,300	50	955	42
6	5,300	226	1,900	140	1,900	126	1,320	70	1,000	50	800	42
8	4,000	308	1,400	140	1,400	126	1,000	70	800	50	600	42
10	3,200	308	1,100	140	1,100	126	800	70	640	50	475	42
12	2,600	308	930	140	930	126	660	70	530	50	400	42
16	2,000	308	700	140	700	126	500	70	400	50	300	42
20	1,600	308	560	140	560	126	400	70	320	50	240	42
25	1,200	308	450	140	450	126	320	70	250	50	190	42

Maximum depth of cut



a_p=0.3D

p_f=0.7D

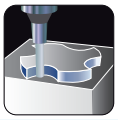
(1) Reduce speeds & feeds 20-30% for HYP-EBML (Long series).
(2) Reduce speeds & feeds 40-50% for HYP-EBMXL. (Extra long series).
(3) Increase speeds & feeds 20-30% for HYP-EBM-XCEED (coated).
(4) Column for Hardened Steels (40-50 HRC) is for XCEED coated tools only.

MILLING CONDITIONS

High performance 4 flute carbide roughing end mill

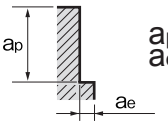
PROFILING

HYP-HP-WRESF



	Cast Iron		Mild Steels Carbon Steels		Pre-hardened Steels / Die & Alloy Steels				Hardened Steels / SUS 304	
			< 180 HB		< 30 HRC		< 38 HRC		< 45 HRC	
Vc	80 m/min		80 m/min		70 m/min		55 m/min		m/min	
ø	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**
6	4,200	585	4,200	585	3,700	370	2,900	230	2,650	210
8	3,150	565	3,150	565	2,750	350	2,150	230	1,950	210
10	2,500	500	2,500	500	2,200	350	1,750	230	1,550	210
12	2,100	500	2,100	500	1,850	330	1,450	230	1,300	210
16	1,550	400	1,550	400	1,350	320	1,050	230	995	210
20	1,250	375	1,250	375	1,100	320	875	240	795	220
25	870	300	870	300	830	295	640	220	575	200

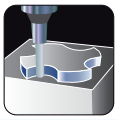
Maximum depth of cut



a_p=1.5D
a_e=0.1D

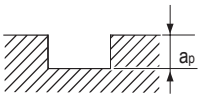
SLOTTING

HYP-HP-WRESF



	Cast Iron		Mild Steels Carbon Steels		Pre-hardened Steels / Die & Alloy Steels				Hardened Steels / SUS 304	
			< 180 HB		< 30 HRC		< 38 HRC		< 45 HRC	
Vc	m/min		m/min		m/min		m/min		m/min	
ø	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**
6	3,150	315	3,150	315	2,650	265	2,300	180	2,100	165
8	2,350	300	2,350	300	1,950	250	1,750	175	1,550	155
10	1,900	300	1,900	300	1,550	245	1,400	165	1,250	150
12	1,550	280	1,550	280	1,300	235	1,150	160	1,050	145
16	1,150	280	1,150	280	995	235	875	140	795	125
20	955	280	955	280	795	235	700	140	635	125
25	700	245	700	245	640	225	510	125	460	115

Maximum depth of cut



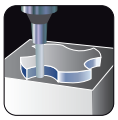
D < 2	0.3D
2 < D	0.5D

MILLING CONDITIONS

4 flute high helix carbide end mill

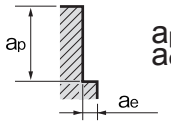
SIDE MILLING

HYP-EHS, CR-EHS



	Cast Iron		Mild Steels Carbon Steels		Alloy Steels Tool Steels Ti (Annealed)		Hardened Steels Titanium Alloys Treated & aged		Hardened Steels Stainless Steels Nickel Base Alloys		Aluminium Alloys	
			< 220 HB		< 30 HRC		< 38 HRC		< 45 HRC			
Vc	102 m/min		120 m/min		96 m/min		72 m/min		48 m/min		132 m/min	
ø	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**
4	8,160	840	9,600	1,800	7,680	1,560	5,760	480	3,840	288	10,560	1,320
6	5,400	960	6,360	2,040	5,040	1,800	3,840	480	2,520	312	6,960	1,560
8	4,080	840	4,800	1,920	3,840	1,680	2,880	744	1,920	492	5,280	1,440
10	3,240	816	3,840	1,680	3,000	1,560	2,280	720	1,560	492	4,200	1,320
12	2,760	792	3,240	1,680	2,520	1,440	1,920	612	1,260	420	3,480	1,200
16	2,040	660	2,400	1,320	1,920	1,140	1,440	468	960	396	2,640	1,080
20	1,620	540	2,160	1,080	1,500	900	1,140	384	780	312	2,100	960

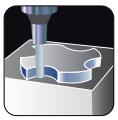
Maximum depth of cut



ap=1.5D
ae=0.1D

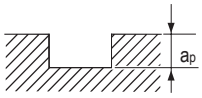
SLOTTING

HYP-EHS, CR-EHS



	Cast Iron		Mild Steels Carbon Steels		Alloy Steels Tool Steels Ti (Annealed)		Hardened Steels Titanium Alloys Treated & aged		Hardened Steels Stainless Steels Nickel Base Alloys		Aluminium Alloys	
			< 220 HB		< 30 HRC		< 38 HRC		< 45 HRC			
Vc	72 m/min		108 m/min		90 m/min		60 m/min		35 m/min		120 m/min	
ø	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**
4	5,760	480	8,640	756	7,200	540	4,800	348	2,880	204	9,548	1,080
6	3,840	480	5,760	876	4,800	756	3,240	408	1,920	276	6,350	1,200
8	2,880	744	4,320	792	3,600	696	2,400	408	1,440	276	4,775	1,140
10	2,280	720	3,480	720	2,880	564	1,920	372	1,140	252	3,800	1,080
12	1,920	612	2,880	696	2,400	540	1,560	348	960	240	3,200	960
16	1,440	468	2,160	576	1,800	475	1,200	264	720	216	2,400	840
20	1,140	384	1,680	504	1,440	384	960	216	576	168	1,900	?-720

Maximum depth of cut



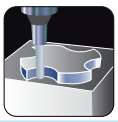
= < D x 1

= < D x 0.5

MILLING CONDITIONS

Stub 3 flute carbide end mill for aluminium

SLOTTING



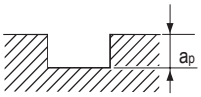
HYP-ACE-STUB

Aluminium Alloys

A6061, A7075

Vc	365 m/min		
Ø	**Speed (min⁻¹)**	**Fz (mm)**	**Feed (mm/min.)**
3	38,700	0.03	3,810
4	29,000	0.05	4,590
6	19,400	0.09	5,280
8	14,500	0.13	5,490
10	11,600	0.16	5,550
12	9,700	0.19	5,540
16	7,300	0.24	5,360
20	5,800	0.29	5,040
25	4,600	0.33	4,580

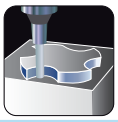
Maximum depth of cut



= < D x 0.5

(1) For side milling increase feeds 20-50%

SLOTTING



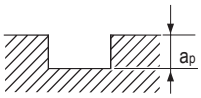
HYP-ACE-REGULAR

Aluminium Alloys

A6061, A7075

Vc	300 m/min		
Ø	**Speed (min⁻¹)**	**Fz (mm)**	**Feed (mm/min.)**
3	31,800	0.03	3,130
4	23,900	0.05	3,780
6	15,900	0.09	4,330
8	11,900	0.13	4,510
10	9,500	0.16	4,550
12	8,000	0.19	4,570
16	6,000	0.24	4,410
20	4,800	0.29	4,170
25	3,800	0.33	3,790

Maximum depth of cut



= < D x 0.5

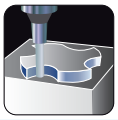
(1) For side milling increase feeds 20-50%

MILLING CONDITIONS

Multi-flute carbide end mill

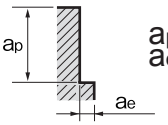
SIDE MILLING

HYP-ROCKET-MILL, LS-ROCKET-MILL



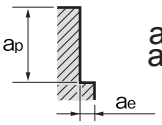
	Mild Steels Cast Iron		Alloy Steels Tool Steels		Hardened Steels Tool Steels				Titanium Alloy		Nickel Base Alloys	
	< 25 HRC		< 45 HRC		< 55 HRC		< 60 HRC		< 40 HRC		< 45 HRC	
Vc	132 m/min		72 m/min		39 m/min		22 m/min		66 m/min		20 m/min	
Ø	**Speed (min⁻¹)**	**Feed (mm/min.)**	**Speed (min⁻¹)**	**Feed (mm/min.)**	**Speed (min⁻¹)**	**Feed (mm/min.)**	**Speed (min⁻¹)**	**Feed (mm/min.)**	**Speed (min⁻¹)**	**Feed (mm/min.)**	**Speed (min⁻¹)**	**Feed (mm/min.)**
3	11,400	1,800	6,360	480	3,240	192	2,280	120	5,040	840	1,680	54
4	8,640	1,800	4,800	480	2,640	240	1,800	120	3,840	900	1,260	66
5	6,840	1,560	3,840	480	2,160	264	1,560	120	3,000	900	984	84
6	6,360	3,120	3,480	1,020	1,920	360	1,320	192	2,520	1,080	840	108
8	4,800	2,880	2,640	1,020	1,440	360	996	180	1,920	1,080	624	108
10	3,840	2,520	2,160	1,020	1,152	336	804	180	1,560	960	480	108
12	3,480	2,520	1,920	924	960	336	672	156	1,260	900	408	96
16	2,640	1,920	1,440	696	720	264	528	120	960	840	312	84
20	2,160	1,560	1,140	552	576	192	420	102	780	720	240	84
25	1,500	1,440	900	570	450	216	300	96	720	600	216	72

Maximum depth of cut



ap=1.5D
ae=0.1D

Maximum depth of cut



ap=1.5D
ae=0.05D

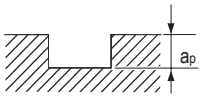
1 flute carbide end mill

SLOTTING

HYP-F1

	Aluminium		Plastics	
Vc				
Ø	**Speed (min⁻¹)**	**Feed (mm/min.)**	**Speed (min⁻¹)**	**Feed (mm/min.)**
3	40,000	2,500	20,000	2,000
4	35,000	2,500	20,000	2,000
5	30,000	3,000	20,000	3,000
6	25,000	3,000	20,000	3,000
8	25,000	3,000	20,000	3,000
10	22,300	3,000	16,000	3,000
12	18,600	3,000	13,500	3,000

Maximum depth of cut

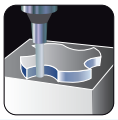


= < D x 0.5

MILLING CONDITIONS

4 flute square end / ball nose diamond coated carbide end mills

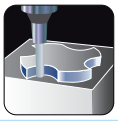
HYP-EMS-DIAMOND / EBM DIAMOND



	Graphite		Green Ceramic Thermoset Plastic		Fibre Filler Plastic	
Vc	50 ~ 900 m/min		25 ~ 420 m/min		40 ~ 240 m/min	
Ø	**Speed (min⁻¹)**	**Fz (mm)**	**Speed (min⁻¹)**	**Fz (mm)**	**Speed (min⁻¹)**	**Fz (mm)**
2	40,000	0.025 ~ 0.05	20,000	0.025 ~ 0.05	11,000	0.025 ~ 0.05
3	40,000	0.025 ~ 0.05	16,000	0.025 ~ 0.05	10,500	0.025 ~ 0.05
4	40,000	0.025 ~ 0.05	16,000	0.025 ~ 0.05	10,500	0.025 ~ 0.05
5	40,000	0.025 ~ 0.05	15,000	0.025 ~ 0.05	10,000	0.025 ~ 0.05
6	36,000	0.050 ~ 0.10	12,500	0.050 ~ 0.10	9,000	0.040 ~ 0.08
8	32,000	0.050 ~ 0.10	12,000	0.050 ~ 0.10	8,000	0.050 ~ 0.10
10	28,000	0.075 ~ 0.12	11,500	0.075 ~ 0.12	7,000	0.075 ~ 0.12
12	24,000	0.075 ~ 0.12	11,000	0.075 ~ 0.12	6,000	0.075 ~ 0.12
16	19,000	0.075 ~ 0.12	8,750	0.075 ~ 0.12	4,750	0.075 ~ 0.12
20	15,000	0.075 ~ 0.12	7,000	0.075 ~ 0.12	3,800	0.075 ~ 0.12

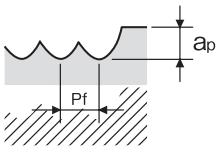
(1) For high speed / feed milling reduce the depth of cut.
(2) Reduce speeds & feeds 30% for slotting > 0.5D.

HYP-EMS-DIAMOND / EBM DIAMOND

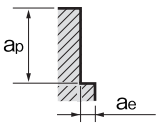


	Aluminium Alloys		MMC		Copper Alloys	
Vc	50 ~ 2400 m/min		30 ~ 225 m/min		100 ~ 2000 m/min	
Ø	**Speed (min⁻¹)**	**Fz (mm)**	**Speed (min⁻¹)**	**Fz (mm)**	**Speed (min⁻¹)**	**Fz (mm)**
2	25,000	0.025 ~ 0.05	20,000	0.025 ~ 0.05	25,000	0.025 ~ 0.05
3	24,000	0.025 ~ 0.05	16,000	0.025 ~ 0.05	24,000	0.025 ~ 0.05
4	20,000	0.025 ~ 0.05	16,000	0.025 ~ 0.05	20,000	0.025 ~ 0.05
5	16,000	0.025 ~ 0.05	15,000	0.025 ~ 0.05	16,000	0.025 ~ 0.05
6	12,000	0.040 ~ 0.08	12,000	0.040 ~ 0.08	12,000	0.040 ~ 0.08
8	9,500	0.050 ~ 0.10	9,500	0.050 ~ 0.10	9,500	0.050 ~ 0.10
10	8,000	0.075 ~ 0.12	8,000	0.075 ~ 0.12	8,000	0.075 ~ 0.12
12	6,000	0.075 ~ 0.12	6,000	0.075 ~ 0.12	6,000	0.075 ~ 0.12
16	4,750	0.075 ~ 0.12	4,750	0.075 ~ 0.12	4,750	0.075 ~ 0.12
20	3,900	0.075 ~ 0.12	3,900	0.075 ~ 0.12	3,900	0.075 ~ 0.12

Dia	ap	pf
D < 3	0.02D	0.05D
D > 3	0.1D	0.2D



Dia	ap	ae
D < 3	0.5D	0.05D
D > 3	1D	0.1D



MILLING CONDITIONS

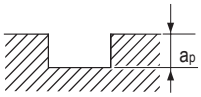
2-flute carbide end mill for Aluminium

SLOTTING

HYP-AL-EDS / EDL / LS-EDS

	Aluminium Alloys		Copper Alloys	
Vc	150 m/min		75 m/min	
ø	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**
6	7,950	630	3,950	310
8	5,950	665	2,950	350
10	4,750	745	2,350	365
12	3,950	790	1,950	390
16	2,950	795	1,450	390
20	2,350	785	1,150	385
25	1,900	785	950	385

Maximum depth of cut



= < D x 1

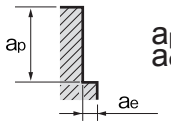
(1) Reduce speeds & feeds 20-30% for HYP-AL-EDL (Long series). and HYP-AL-LS-EDS (Long with neck).

SIDE MILLING

HYP-AL-EDS / EDL / LS-EDS

	Aluminium Alloys		Copper Alloys	
Vc	200 m/min		75 m/min	
ø	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**
6	10,500	830	3,950	310
8	7,950	890	2,950	350
10	6,350	995	2,350	365
12	5,300	1,050	1,950	390
16	3,950	1,050	1,450	390
20	3,150	1,050	1,150	385
25	2,250	1,050	950	385

Maximum depth of cut



ap=1.5D
ae=0.1D

(1) Reduce speeds & feeds 20-30% for HYP-AL-EDL (Long series). and HYP-AL-LS-EDS (Long with neck).

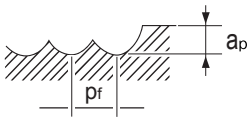
MILLING CONDITIONS

2 flute ball end carbide end mill for Aluminium

PROFILING — **HYP-AL-LS-EBD**

	Aluminium Alloys		Copper Alloy	
	A6061, A7075		C1100	
Vc	200 m/min		150 m/min	
Ø	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**
3	21,200	1,550	15,900	1,150
4	15,900	1,550	11,900	1,150
5	12,750	1,575	9,500	1,150
6	10,600	1,600	7,950	1,150
8	7,950	1,950	5,950	1,450
10	6,350	1,750	4,750	1,300
12	5,300	1,650	3,950	1,200

Maximum depth of cut

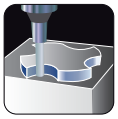


a_p=0.1D

p_f=0.2D

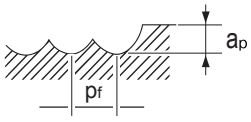
2 flute ball end carbide end mill for difficult materials

PROFILING — **HYP-Ti-EBD**



	Cast Iron		Mild Steels Carbon Steels		Tool Steels Ti (Annealed)		Pre-hardened / Die / Alloy Steels Titanium (treated & aged) Inconel				Hardened Steels	
			< 225 HB		< 30 HRC		< 38 HRC		< 45 HRC		< 55 HRC	
Vc	210 m/min		168 m/min		138 m/min		108 m/min		96 m/min		84 m/min	
Ø	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**	**Speed (min^{-1})**	**Feed (mm/min.)**
3	21,212	1,350	17,244	1,100	14,475	906	11,628	588	10,188	432	8,736	312
4	16,740	1,350	13,800	1,100	11,560	906	9,228	636	8,064	528	6,910	384
5	13,320	1,512	10,656	1,230	8,890	918	7,068	642	6,228	534	5,316	408
6	10,944	1,572	8,736	1,280	7,280	990	5,770	690	5,076	576	4,332	432
8	8,652	1,860	6,912	1,500	5,740	1,128	4,570	792	3,996	648	3,420	462
10	6,648	1,704	5,316	1,360	4,420	1,056	3,500	744	3,072	618	2,640	474
12	4,000	1,554	4,296	1,240	3,610	990	2,870	696	2,508	594	2,120	438

Maximum depth of cut



a_p=0.1D

p_f=0.2D

a_p=0.05D

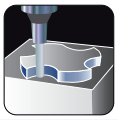
p_f=0.1D

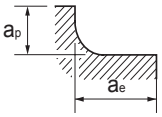
MILLING CONDITIONS

4 flute variable lead ball nose carbide endmill.

SIDE MILLING

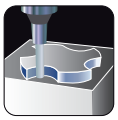
HYP-VG4

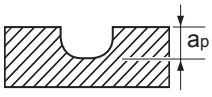


	Mild Steels Carbon Steels Cast Iron		400 Stainless Steels Alloy Steels		300 Stainless Steels Hardened Steel		PH Stainless Steels Hardened Steel		Hardened Steel		Titanium Alloys		Nickel Base Alloys	
	< 25 HRC		< 30 HRC		< 35 HRC		< 45 HRC		< 50 HRC		< 35 HRC		< 35 HRC	
Vc	120 ~ 150 m/min		90 ~120 m/min		60 ~ 110 m/min		60 ~ 75 m/min		50 ~ 70 m/min		50 ~ 75 m/min		30 ~ 45 m/min	
Ø	Speed (min^{-1})	Feed (mm/min.)	Speed (min^{-1})	Feed (mm/min.)	Speed (min^{-1})	Feed (mm/min.)	Speed (min^{-1})	Feed (mm/min.)	Speed (min^{-1})	Feed (mm/min.)	Speed (min^{-1})	Feed (mm/min.)	Speed (min^{-1})	Feed (mm/min.)
3	14,300	1,100	11,100	640	9,000	480	7,200	380	6,400	360	6,600	330	4,000	250
4	10,700	1,160	8,400	720	6,800	530	5,400	420	4,800	410	4,900	340	3,000	290
5	8,600	1,170	6,700	780	5,400	520	4,300	420	3,800	420	3,900	350	2,400	290
6	7,200	1,210	5,600	810	4,500	550	3,600	440	3,200	450	3,300	380	2,000	310
8	5,400	1,180	4,200	770	3,400	530	2,700	430	2,400	410	2,500	370	1,500	290
10	4,300	1,140	3,300	750	2,700	520	2,200	420	1,900	400	2,000	350	1,200	290
12	3,600	1,140	2,800	730	2,300	510	1,800	400	1,600	400	1,600	350	1,000	280
Maximum depth of cut			ap=1.5D ae=0.5D				ap=1.25D ae=0.4D		ap=1.25D ae=0.2D		ap=1.25D ae=0.4D		ap=1D ae=0.2D	

SLOTTING

HYP-VG4



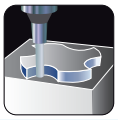
	Mild Steels Carbon Steels Cast Iron		400 Stainless Steels Alloy Steels		300 Stainless Steels Hardened Steel		PH Stainless Steels Hardened Steel		Hardened Steel		Titanium Alloys		Nickel Base Alloys	
	< 25 HRC		< 30 HRC		< 35 HRC		< 45 HRC		< 50 HRC		< 35 HRC		< 35 HRC	
Vc	100 ~ 120 m/min		75 ~100 m/min		50 ~ 85 m/min		50 ~ 60 m/min		45 ~ 55 m/min		40 ~ 60 m/min		20 ~ 30 m/min	
Ø	Speed (min^{-1})	Feed (mm/min.)	Speed (min^{-1})	Feed (mm/min.)	Speed (min^{-1})	Feed (mm/min.)	Speed (min^{-1})	Feed (mm/min.)	Speed (min^{-1})	Feed (mm/min.)	Speed (min^{-1})	Feed (mm/min.)	Speed (min^{-1})	Feed (mm/min.)
3	11,700	900	9300	540	7200	390	5800	270	5300	300	5300	270	2700	170
4	8,800	960	7000	600	5400	440	4400	290	4000	340	4000	290	2000	190
5	7,000	950	5600	640	4300	430	3500	310	3200	370	3200	300	1600	190
6	5,800	970	4700	680	3600	460	2900	330	2700	380	2700	310	1300	200
8	4,400	960	3500	640	2700	440	2200	310	2000	340	2000	290	1000	190
10	3,500	920	2800	620	2100	410	1800	310	1600	340	1600	300	800	190
12	2,900	920	2300	600	1800	410	1500	300	1300	330	1300	290	700	200
Maximum depth of cut			= < D x 1				= < D x 0.75		= < D x 0.5		= < D x 0.5		= < D x 0.2	

MILLING CONDITIONS

High feed side milling carbide end mill

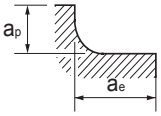
HIGH FEED SIDE MILLING

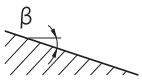
HYP-HS-CRE



	Cast Iron		SKT / SKD NAK55 / HPM1		SUS30 / SKD NAK80 / HPM50		Hardened Steels			
			< 38 HRC		< 45 HRC		< 55 HRC		< 60HRC	
Vc	m/min		m/min		m/min		m/min		m/min	
ø	**Speed (min⁻¹)**	**Feed (mm/min.)**	**Speed (min⁻¹)**	**Feed (mm/min.)**	**Speed (min⁻¹)**	**Feed (mm/min.)**	**Speed (min⁻¹)**	**Feed (mm/min.)**	**Speed (min⁻¹)**	**Feed (mm/min.)**
6 X R 1,50	5,300	6,300	4,250	4,600	3,700	4,000	2,650	2,600	1,600	1,050
8 X R 2,00	4,000	6,300	3,200	4,600	2,800	4,000	2,000	2,600	1,200	1,050
10 X R 2,00	3,200	6,300	2,550	4,600	2,250	4,000	1,600	2,600	955	1,050
12 X R 3,00	2,650	6,300	2,100	4,600	1,850	4,000	1,350	2,600	795	1,050

Maximum depth of cut





ap	ae
0.1 x R	0.3D

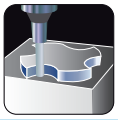
Dia	ap	ae
R ≤ 2	0.1 x R	0.3D
2 < R	0.2 mm	0.3D

Dia	ap	ae
R ≤ 2	0.05 x R	0.3D
2 < R	0.1 mm	0.3D

2 flute ball nose carbide end mill (low torque / better surface finish / longer life)

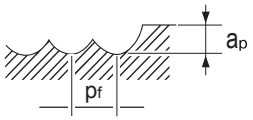
PROFILING

HYP-SB-EBD



	Copper Alloy				Pre Hardened / Hardened Steels											
					< 35 HRC				< 42 HRC				< 55 HRC			
Vc	300 m/min				280 m/min				260 m/min				240 m/min			
ø	**Speed (min⁻¹)**	**Feed (mm/min.)**	**ap (mm)**	**pf (mm)**	**Speed (min⁻¹)**	**Feed (mm/min.)**	**ap (mm)**	**pf (mm)**	**Speed (min⁻¹)**	**Feed (mm/min.)**	**ap (mm)**	**pf (mm)**	**Speed (min⁻¹)**	**Feed (mm/min.)**	**ap (mm)**	**pf (mm)**
3	31,847	2,866	0.15	0.60	29,724	2,675	0.15	0.60	27,601	2,484	0.15	0.60	25,478	2,293	0.15	0.60
4	23,885	2,866	0.20	0.80	22,293	2,675	0.20	0.80	20,701	2,484	0.20	0.80	19,108	2,293	0.20	0.80
5	19,108	2,866	0.25	1.00	17,834	2,675	0.25	1.00	16,561	2,484	0.25	1.00	15,287	2,293	0.25	1.00
6	15,924	2,866	0.30	1.20	14,862	2,675	0.30	1.20	13,800	2,484	0.30	1.20	12,739	2,293	0.30	1.20
8	11,943	2,866	0.40	1.60	11,146	2,675	0.40	1.60	10,350	2,484	0.40	1.60	9,554	2,293	0.40	1.60
10	9,664	2,866	0.50	2.00	8,917	2,675	0.50	2.00	8,280	2,484	0.50	2.00	7,643	2,293	0.50	2.00
12	7,962	2,866	0.60	2.40	7,431	2,675	0.60	2.40	6,900	2,484	0.60	2.40	6,369	2,293	0.60	2.40

Maximum depth of cut

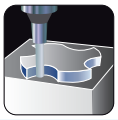


MILLING CONDITIONS

4 flute variable carbide endmills.

MILLING

HYP-HI-EMS / (W)EMS / CR-HI-(W)EMS / CR-HD-(W)EMS



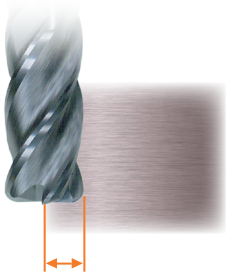
	Low Carbon / Alloy / Tool Steel						Cast Iron		Stainless Steel		Aluminium / Mg		Titanium	
	500 ~ 800 N/mm²		< 30 HRC		< 40 HRC		> HB 180		< 20 HRC				< 50 HRC	
Vc	160 m/min		120 m/min		100 m/min		140 m/min		50 m/min		180 m/min		65 m/min	
ø	Speed (min⁻¹)	Feed (mm/min.)	Speed (min⁻¹)	Feed (mm/min.)	Speed (min⁻¹)	Feed (mm/min.)	Speed (min⁻¹)	Feed (mm/min.)	Speed (min⁻¹)	Feed (mm/min.)	Speed (min⁻¹)	Feed (mm/min.)	Speed (min⁻¹)	Feed (mm/min.)
4	12,730	1.79	9,550	1.15	7,960	960	11,150	1.57	3,980	480	14,330	2.01	5,180	520
6	8,490	1.36	6,370	900	5,310	750	7,430	1.19	2,660	380	9,550	1.53	3,450	380
8	6,370	1.79	4,780	1.25	3,980	1040	5,580	1.57	1,990	520	7,170	2.01	2,590	330
10	5,090	2.04	3,820	1.23	3,190	1030	4,460	1.79	1,600	520	5,730	2.3	2,070	320
12	4,240	2.04	3,190	1.28	2,660	1070	3,720	1.79	1,330	540	4,780	2.3	1,730	320
16	3,180	1.66	2,390	1.15	1,990	960	2,790	1.46	1,000	480	3,590	1.87	1,300	280
20	2,550	1.53	1,910	920	1,600	770	2,230	1.34	800	390	2,870	1.73	1,040	250

ae = width of cut / ap = depth of cut

When changing milling type from slotting to side milling please reduce speeds and feeds using the coefficients below

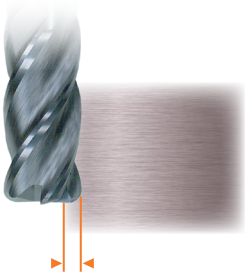
ap	Coe.
0.5	**1.0**
1.0	0.7
1.5	0.5
2.0	0.3

ae = 1 x D



ap	Coe.
0.5	1.2
1.0	**1.0**
1.5	0.7
2.0	0.5

ae = 0.5 x D



ap	Cow.
0.5	1.3
1.0	1.2
1.5	**1.0**
2.0	0.8

ae = 0.2 x D

The above stated milling conditions are based on using the RED marked parameters

Hardness / Tensile Strength Conversion

N/mm²(MPa)	Brinel	Rockwell	Rockwell	Shore Scale		Tensile Stength	
HV	HB	HRB	HRC		Tons / sq.in	Kg / sq.mm	N/mm2 (MPa)
965			70	106			
936			69	103			
908			68	100			
880			67	97			
853			66	95			
826			65	93			
799			64	91			
773			63	89			
747			62	87			
718	682		61	64	147	232	
687	653		59	82	142	224	
660	627		58.5	81	137	216	2220
633	601		57	78	132	208	2110
608	578		56	76	127	200	2030
584	555		55	75	122	192	
562	534		53.5	72	117	179	1845
541	541		52	70	112	176	1775
521	495		51	68	108	170	1700
502	477		50	67	105	165	1630
485	461		48	65	101	160	1485
457	444		47	63	98	156	
452	429		45.5	61	95	150	1455
437	415		44.5	59	92	145	1410
422	401		42	55	88	139	1350
408	388		41	54	85	134	1320
395	375		40	52	82	130	
382	363		39	51	80	126	1220
371	352		37.5	50	77	122	1190
359	341		36.5	49	75	118	
348	331		35.5	48	73	114	1120
338	321		34	45	71	111	1095
327	311		33	44	68	107	
318	302		32	43	66	104	1030
308	293		31	42	64	101	
300	285		29.5	40	63	99	965
292	277		28.5	38	61	96	930
283	269		27	38	59	93	905
276	262		26	37	56	91	880
268	255		25	37	56	69	855
261	248		24	36	55	87	
254	241		23.5	35	53	84	
247	235		21.5	34	51	81	
241	229		20.5	33	50	79	770
235	223	99.9	19.5	33	49	77	755
228	217	98.7		32	48	76	
223	212	98		32	46	73	
218	207	97		31	45	71	
213	202	95.5		31	44	70	
207	197	95		30	43	68	

N/mm²(MPa)	Brinel	Rockwell	Rockwell	Shore Scale		Tensile Stength	
HV	HB	HRB	HRC		Tons / sq.in	Kg / sq.mm	N/mm2 (MPa)
202	192	94		30	42	66	
197	187	93		29	41	65	
192	182	92		29	40	64	
188	179	91		28	40	62	
183	174	90		28	39	60	305
179	170	88		27	39	57	
175	166	88		26	37	55	
172	163	87		26	36	55	
167	169	85.5		25	35	56	280
164	156	84		25	34	54	
161	153	84		25	34	52	
157	149	82		24	33	51	
154	146	81		23	33	55	
151	143	81		23	32	49	270
147	140	79		22	31	49	
144	137	78		22	31	48	
141	134	76		21	30	48	255
138	131	74		20	30	47	
135	126	73		20	29	47	
133	126	72			28	46	
131	124	72			28	45	
127	121	70			27	44	
124	118	68			27	43	
122	116	67			26	43	
120	114	66			26	41	
110	112	64			26	41	
115	109	64			25	40	
113	107	61			25	40	
111	105	61			24	39	
108	103				24	39	

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