

OCTOBER
2020

ENCORE
CUTTING TOOLS


















MADE IN UAE

SPECIAL APPLICATION TOOLS

SHARP | LONG LASTING



PICTOGRAMS LEGEND

	SHORT SERIES		CUTTERS WITH CORNER RADIUS
	STANDARD SERIES		CUTTERS WITH CORNER CHAMFER
	LONG SERIES		FLUTE NUMBER
	CYLINDRICAL SHANK		DEPTH EQUALS N TIMES DIAMETER
	TOOL SHANK TOLERANCE		TiAlN COATING
	DRILL FACE ANGLE		CUTTERS WITH 2 FLUTES CENTRE CUTTING.
	CUTTING DIAMETER TOLERANCE		CUTTERS WITH 3 FLUTES CENTRE CUTTING.
	DRILLS WITH THROUGH COOLANT		CUTTERS WITH 4 FLUTES CENTRE CUTTING.
	HELIX ANGLE		RADIAL FACE GEOMETRY
	SUITABLE FOR SLOT MILLING		SUITABLE FOR MACHINES
	SUITABLE FOR SIDE MILLING (FINISH/ROUGH)		FLUTE LENGTHS WITH TWO DIFFERENT DEPTHS
	SUITABLE FOR 3D MACHINES		RIGHT HAND CUTTING FOR REAMERS

DIRECTOR'S MESSAGE

Dear Customers,

We are excited to bring to you our whole range of products under a new brand - ENCORE.

In 2011, Falcon Group of Companies ventured into the cutting tools regrinding business mainly for in-house operational support and to service a handful of clients in the manufacturing business. Today Middle East Precision Re grind LLC is the first and only company in the Middle East capable of designing, modifying and manufacturing high end standard and custom cutting tools made from Carbide, HSS or brazed carbide/PCD tips.

We are committed to solve challenges the region faces around sourcing non-standard cutting tools, tool holders and consumable products needed for various industries including hot tapping and aluminum smelting operations.

As always, we appreciate your loyalty and will continue striving to deliver the best products and support, to help facilitate your vital work of providing your customers with the best products and services for them to succeed in their business.

Rejin Jose Kurian
Managing Director

ABOUT US

Middle East Precision Re grind LLC is the first cutting tools manufacturing firm in Middle East. Since its founding, our company has earned a reputation among cutting tool industries for professionalism and commitment to excellence in service. Based on our broad experience in a full spectrum of manufacturing and regrinding end mills, drills, reamers and other cutting tools MEPR emerged into leading company providing cutting tools for various industrial sectors such as aerospace, pipelines, oil and gas, construction, fabrications, wood, composite and aluminum industries.

MEPR is a performance proven cutting tool regrinding company now developed and emerged into manufacturing and supply of quality and precision tools. We design and build our own tools geometry for different applications for smooth machining of steel, composite, wood etc. We are committed to continuous process improvement, and utilize the best machining tools available to provide our customers with high quality parts, competitive pricing and on-schedule delivery.

SERVICES

Our products and services enhance customers productivity and improves machining time. We are committed to providing our customers with products and services that continually meet or exceed their expectations.

TOOLS MANUFACTURING



MEPR manufactures all kind of cutting tools like end mills, drill bits, profile cutters, taper tools, reamers or special tools.

TOOLS REGRINDING



We are experts in regrinding and resharpener of broken and worn cutters and tools like end mills, drill bits, profile cutters, etc.

BRAZED TOOLS



We have a fully equipped facility for brazed tools manufacturing.

PRODUCTS

We provide customized tools that cater to every need for companies that operate in the below sectors

AEROSPACE AND AIRCRAFT INDUSTRY



The aerospace and aircraft industry is the most rigorous industry that requires and demand cutting tools unexpectedly anytime. We offer products, capacity and technical support for critical production requirements by providing production tools for manufacturing and maintenance such us step drills, pilot drills and reamers, end mills, adaptor drills and other complex special tools. We also help them by converting their worn out tools to reproducible and reusable ones.

PIPE LINE SERVICES



We manufacture precision tools and restore wear parts for pipeline industries as well. We specialize in manufacturing of customized bevel tools and parting tools required for cold cutting. Our skilled technicians can produce a large range of products from bespoke form tools, boring tools and form cutters.

CONSTRUCTION AND FABRICATION



We manufacture and supply a wide range of engineering tools to the UAE construction engineering and steel fabricating sectors. We focus on drills, end mills, and inserts which assure constant high performance for every application.

OIL AND GAS INDUSTRY



We design, manufacture, modify and regrind the complete range of milling cutters, reamers, drill bits, special carbide cutters and brazed tools (carbide, PCD, etc.) for all types of applications in oil and gas industries.

MACHINE SHOP AND ENGINEERING



We design, manufacture and modify standard & non-standard milling tools, tool holders and different profile cutters as per requirements. We excel at bespoke and special requirement tools that are used in CNC machines for metal works.

TOOL & DIE MAKERS



We develop and manufacture quality and precision tools to support the tool & die making industry. We also alter and upgrade existing tooling as needed and demanded by the customers.

WOOD INDUSTRY



We manufacture and regrind different cutting tools and blades for wooden and paper industries. This includes different profile cutters, special blades, and rotary cutting blades. We can also do any type of profile cutters as per customer requirement in solid carbide, HSS and brazed tools.

COMPOSITE INDUSTRY



MEPR has been designing, manufacturing and regrinding high quality carbide tools, diamond cutters (blades, hole saws, etc.) and specialized tools (long end mills, PCD tipped tools, ball nose, chamfer tools) for the composite industry.

HOT TAPPING INDUSTRY



MEPR is fully equipped with a brazed tip hot tapping cutter manufacturing and regrinding unit. We also manufacture and regrind pilot drills, HSS and carbide tipped cutters with high quality materials supporting oil and gas and pipeline industries to reduce machining time and budget cost. We are also capable of manufacturing other parts like split- tees, line stop valves and other parts required for hot tapping projects.

ALUMINIUM INDUSTRY



We have developed a large number of tools for aluminium smelters globally like end mills, reamers, drills, custom drills counter bores, step drills, form tools and profile cutters. We have contributed vastly in improving OPEX costs through R&D and reverse engineering.

MARINE INDUSTRY

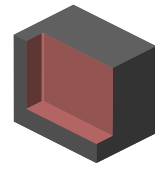
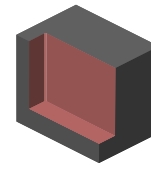
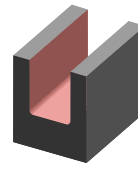


MEPR has supported various marine companies in the manufacturing and modification of drills, end mills, hand reamers , special tools, engraving tools, pins, punches and dies etc. that are used for the maintenance and repairing of ships and their equipment's.

TABLE OF CONTENTS

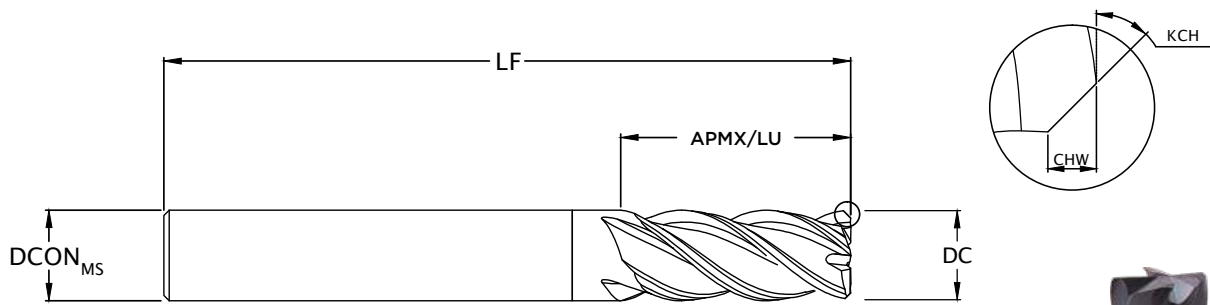
End Mills With Chamfer	6
Finish End Mills	8
Slot Milling End Mills	10
Long End Mills	12
2 Flute End Mills	14
3 Flute End Mills	16
Corner Radius End Mills	18
Ball Nose End Mills	20
Stub Ball Nose	22
Standard Drill	24
Long Drills	25
Reamer	26
Coating Properties	27
Solid Carbide Special And Profile Tools	28
Carbide Tipped Brazed Tools	29
Hot Tapping And Pilot Drills	30
Holder And Mounting Heads	31

END MILLS WITH CHAMFER



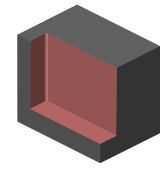
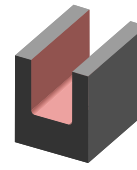
MATERIAL				FULL SLOTTING	SIDE ROUGHING		SIDE FINISHING		
ISO	Description	Specifications	Hardness	fz (mm/rev)	Vc (m/min)	fz (mm/rev)	Vc (m/min)	fz (mm/rev)	Vc (m/min)
P	Low Alloy Steel / Free Cutting	12L14, 12L15, 1030-1060, 1050-1060, 1144-1146	120-200 BHN	0.03-0.1	120	0.03-0.1	150	0.04-0.15	250
	Medium Alloy Steel	4140, 4340, 52100, 8620	200-240 BHN	0.03-0.1	100	0.03-0.1	140	0.04-0.15	200
	High Alloy Steel	4340, 4330V, 300M, etc,	225-300 BHN	0.03-0.1	80	0.03-0.1	120	0.04-0.15	180
H	Hardox	Hardox-500	52-60 Hrc	0.03-0.05	45	0.05-0.08	55	0.03-0.05	60
M	Ferritic/martensitic stainless steel	416, 420, etc,	185-275 BHN	0.013-0.1	65	0.008-0.1	80	0.016-0.18	120
	Austenitic stainless steel	304, 316, 17-4PH, etc,	185-275 BHN	0.009-0.013	65	0.005-0.06	80	0.01-0.12	120
	Duplex stainless steel	318-329, 400-446, DUPLEX	185-275 BHN	0.009-0.013	60	0.005-0.06	80	0.01-0.12	80
K	Malleable	A220-70003, A220-80002	200-320 BHN	0.03-0.1	120	0.03-0.1	150	0.04-0.15	150
	Grey	Grade 150 - 350,	200-320 BHN	0.03-0.1	120	0.03-0.1	150	0.04-0.15	180
	Nodular	A220, A436, A439, A602	200-320 BHN	0.03-0.1	120	0.03-0.1	150	0.04-0.15	150
N	Aluminium Alloys Si < 10%	6061 T6, 7075, 314-340, 380-390	< 120 BHN	0.04-0.2	600	0.07-0.25	900	0.07-0.33	1000
	Aluminium Alloys Si > 10%	Mg Wisker	120-150 BHN	0.04-0.2	130	0.07-0.25	130	0.07-0.33	180
	Copper / Alloys	Alloyed Cu + Al + Fe, Ampco 18-25	180-220 BHN	0.04-0.2	200	0.07-0.25	200	0.07-0.33	250
S	Nickel Based	Monel 400, Hastelloy C, Inconel 625,718, Waspaloy	28-38HRc	0.009-0.013	40	0.005-0.06	40	0.01-0.12	60
	Titanium Alloys	6Al4V, 6Al4V-2Sn, Monel, Monel K	28-38HRc	0.009-0.013	40	0.005-0.06	40	0.01-0.12	60

END MILLS WITH CHAMFER



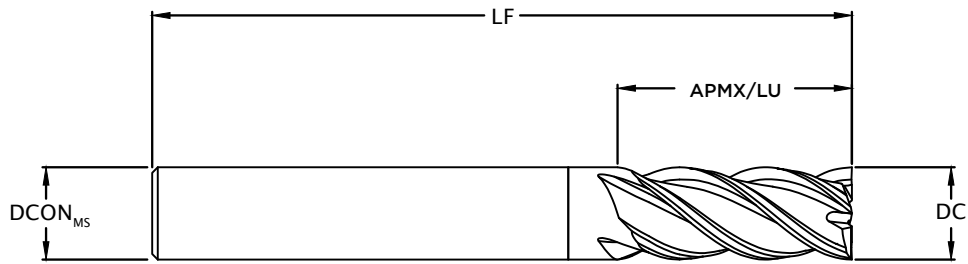
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3	ACE-0300-08-050-4	8	0.10	45°	4	3	50
4	ACE-0400-10-050-4	10	0.15	45°	4	4	50
5	ACE-0500-13-050-4	13	0.15	45°	4	5	50
6	ACE-0600-15-057-4	15	0.20	45°	4	6	57
8	ACE-0800-20-063-4	20	0.30	45°	4	8	63
10	ACE-1000-25-072-4	25	0.30	45°	4	10	72
12	ACE-1200-30-080-4	30	0.50	45°	4	12	80
14	ACE-1400-35-086-4	35	0.50	45°	4	14	86
16	ACE-1600-40-092-4	40	0.50	45°	4	16	92
20	ACE-2000-50-104-4	50	0.50	45°	4	20	104

FINISH END MILLS



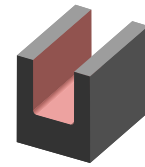
MATERIAL				FULL SLOTTING	SIDE FINISHING		
ISO	Description	Specifications	Hardness	fz (mm/rev)	Vc (m/min)	fz (mm/rev)	Vc (m/min)
P	Low Alloy Steel / Free Cutting	12L14, 12L15, 1030-1060, 1050-1060, 1144-1146	120-200 BHN	0.05-0.08	120	0.04-0.15	250
	Medium Alloy Steel	4140, 4340, 52100, 8620	200-240 BHN	0.05-0.08	100	0.04-0.15	200
	High Alloy Steel	4340, 4330V, 300M, etc,	225-300 BHN	0.05-0.08	80	0.04-0.15	180
H	Hardox	Hardox-500	52-60 Hrc	0.05-0.08	45	0.03-0.05	60
M	Ferritic/martensitic stainless steel	416, 420, etc,	185-275 BHN	0.03-0.08	65	0.016-0.18	120
	Austenitic stainless steel	304, 316, 17-4PH, etc,	185-275 BHN	0.01-0.05	65	0.01-0.12	120
	Duplex stainless steel	318-329, 400-446, DUPLEX	185-275 BHN	0.01-0.05	60	0.01-0.12	80
K	Malleable	A220-70003, A220-80002	200-320 BHN	0.03-0.1	120	0.04-0.15	150
	Grey	Grade 150 - 350,	200-320 BHN	0.03-0.1	120	0.04-0.15	180
	Nodular	A220, A436, A439, A602	200-320 BHN	0.03-0.1	120	0.04-0.15	150
N	Aluminium Alloys Si < 10%	6061 T6, 7075, 314-340, 380-390	< 120 BHN	0.04-0.2	600	0.07-0.33	1000
	Aluminium Alloys Si > 10%	Mg Wisker	120-150 BHN	0.04-0.2	130	0.07-0.33	180
	Copper / Alloys	Alloyed Cu + Al + Fe, Ampco 18-25	180-220 BHN	0.04-0.2	200	0.07-0.33	250
S	Nickel Based	Monel 400, Hastelloy C, Inconel 625,718, Waspaloy	28-38HRc	0.01-0.03	40	0.01-0.12	60
	Titanium Alloys	6Al4V, 6A14V-2Sn, Monel, Monel K	28-38HRc	0.01-0.03	40	0.01-0.12	60

FINISH END MILLS



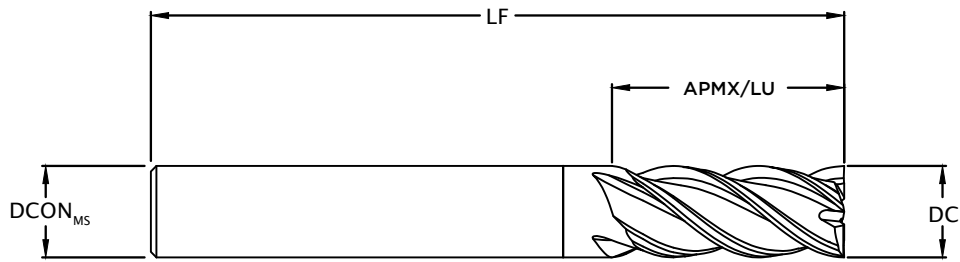
DC	Product Part Number	APMX /LU	ZEFP	DCONMS	LF
2	AFE-0200-05-050-4	5	4	2	50
3	AFE-0300-08-050-4	8	4	3	50
4	AFE-0400-10-050-4	10	4	4	50
5	AFE-0500-13-050-4	13	4	5	50
6	AFE-0600-15-057-4	15	4	6	57
8	AFE-0800-20-063-4	20	4	8	63
10	AFE-1000-25-072-4	25	4	10	72
12	AFE-1200-30-080-4	30	4	12	80
14	AFE-1400-35-086-4	35	4	14	86
16	AFE-1600-40-092-4	40	4	16	92
20	AFE-2000-50-104-4	50	4	20	104

SLOT MILLING END MILLS



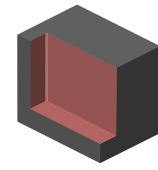
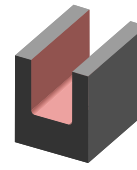
MATERIAL				SLOT MILLING Finish Ae- 10%, Ap - 1xDc	
ISO	Description	Specifications	Hardness	fz (mm/rev)	Vc (m/min)
P	Low Alloy Steel / Free Cutting	12L14, 12L15, 1030-1060, 1050-1060, 1144-1146	120-200 BHN	0.08-0.1	150
	Medium Alloy Steel	4140, 4340, 52100, 8620	200-240 BHN	0.08-0.1	120
	High Alloy Steel	4340, 4330V, 300M, etc,	225-300 BHN	0.05-0.08	100
H	Hardox	Hardox-500	52-60 Hrc	0.05-0.08	45
M	Ferritic/martensitic stainless steel	416, 420, etc,	185-275 BHN	0.03-0.08	80
	Austenitic stainless steel	304, 316, 17-4PH, etc,	185-275 BHN	0.01-0.05	80
	Duplex stainless steel	318-329, 400-446, DUPLEX	185-275 BHN	0.01-0.05	60
K	Malleable	A220-70003, A220-80002	200-320 BHN	0.03-0.1	120
	Grey	Grade 150 - 350,	200-320 BHN	0.03-0.1	120
	Nodular	A220, A436, A439, A602	200-320 BHN	0.03-0.1	120
N	Aluminium Alloys Si < 10%	6061 T6, 7075, 314-340, 380-390	< 120 BHN	0.04-0.2	600
	Aluminium Alloys Si > 10%	Mg Wisker	120-150 BHN	0.04-0.2	200
	Copper / Alloys	Alloyed Cu + Al + Fe, Ampco 18-25	180-220 BHN	0.04-0.2	200
S	Nickel Based	Monel 400, Hastelloy C, Inconel 625,718, Waspaloy	28-38HRc	0.01-0.03	40
	Titanium Alloys	6Al4V, 6Al4V-2Sn, Monel, Monel K	28-38HRc	0.01-0.03	40

SLOT MILLING END MILLS



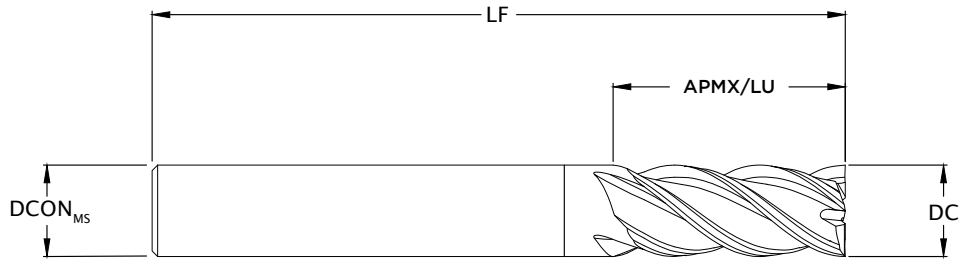
DC	Product Part Number	APMX /LU	ZEFP	DCONMS	LF
2	AFE-0200-05-050-4	5	4	2	50
3	AFE-0300-08-050-4	8	4	3	50
4	AFE-0400-10-050-4	10	4	4	50
5	AFE-0500-13-050-4	13	4	5	50
6	AFE-0600-15-057-4	15	4	6	57
8	AFE-0800-20-063-4	20	4	8	63
10	AFE-1000-25-072-4	25	4	10	72
12	AFE-1200-30-080-4	30	4	12	80
14	AFE-1400-35-086-4	35	4	14	86
16	AFE-1600-40-092-4	40	4	16	92
20	AFE-2000-50-104-4	50	4	20	104

LONG END MILLS



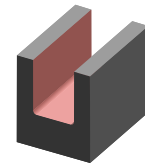
MATERIAL				FULL SLOTTING	SIDE FINISHING		
ISO	Description	Specifications	Hardness	fz (mm/rev)	Vc (m/min)	fz (mm/rev)	Vc (m/min)
P	Low Alloy Steel / Free Cutting	12L14, 12L15, 1030-1060, 1050-1060, 1144-1146	120-200 BHN	0.03-0.1	150	0.04-0.15	250
	Medium Alloy Steel	4140, 4340, 52100, 8620	200-240 BHN	0.03-0.1	140	0.04-0.15	200
	High Alloy Steel	4340, 4330V, 300M, etc,	225-300 BHN	0.03-0.1	120	0.04-0.15	180
H	Hardox	Hardox-500	52-60 Hrc	0.05-0.08	55	0.03-0.05	60
M	Ferritic/martensitic stainless steel	416, 420, etc,	185-275 BHN	0.008-0.1	80	0.016-0.18	120
	Austenitic stainless steel	304, 316, 17-4PH, etc,	185-275 BHN	0.005-0.06	80	0.01-0.12	120
	Duplex stainless steel	318-329, 400-446, DUPLEX	185-275 BHN	0.005-0.06	80	0.01-0.12	80
K	Malleable	A220-70003, A220-80002	200-320 BHN	0.03-0.1	150	0.04-0.15	150
	Grey	Grade 150 - 350,	200-320 BHN	0.03-0.1	150	0.04-0.15	180
	Nodular	A220, A436, A439, A602	200-320 BHN	0.03-0.1	150	0.04-0.15	150
N	Aluminium Alloys Si < 10%	6061 T6, 7075, 314-340, 380-390	< 120 BHN	0.07-0.25	900	0.07-0.33	1000
	Aluminium Alloys Si > 10%	Mg Wisker	120-150 BHN	0.07-0.25	130	0.07-0.33	180
	Copper / Alloys	Alloyed Cu + Al + Fe, Ampco 18-25	180-220 BHN	0.07-0.25	200	0.07-0.33	250
S	Nickel Based	Monel 400, Hastelloy C, Inconel 625,718, Waspaloy	28-38HRc	0.005-0.06	40	0.01-0.12	60
	Titanium Alloys	6Al4V, 6A14V-2Sn, Monel, Monel K	28-38HRc	0.005-0.06	40	0.01-0.12	60

LONG END MILLS



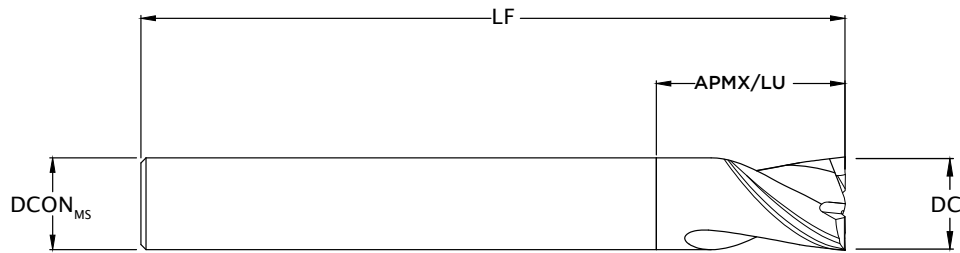
DC	Product Part Number	APMX /LU	ZEFP	DCONMS	LF
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4	ALE-0400-25-065-4	25	4	4	65
5	ALE-0500-30-075-4	30	4	5	75
6	ALE-0600-30-080-4	30	4	6	80
8	ALE-0800-35-080-4	35	4	8	80
10	ALE-1000-50-110-4	50	4	10	110
12	ALE-1200-50-110-4	50	4	12	110
16	ALE-1600-60-125-4	60	4	16	125
20	ALE-2000-60-125-4	60	4	20	125

2 FLUTE END MILLS



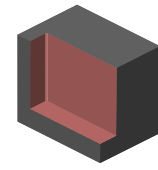
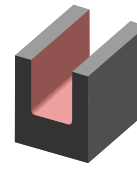
MATERIAL				SLOTTING	
ISO	Description	Specifications	Hardness	fz (mm/rev)	Vc (m/min)
P	Low Alloy Steel / Free Cutting	12L14, 12L15, 1030-1060, 1050-1060, 1144-1146	120-200 BHN	0.03-0.1	120
	Medium Alloy Steel	4140, 4340, 52100, 8620	200-240 BHN	0.03-0.1	100
	High Alloy Steel	4340, 4330V, 300M, etc,	225-300 BHN	0.03-0.1	80
H	Hardox	Hardox-500	52-60 HRc	0.03-0.05	45
M	Ferritic/martensitic stainless steel	416, 420, etc,	185-275 BHN	0.013-0.1	65
	Austenitic stainless steel	304, 316, 17-4PH, etc,	185-275 BHN	0.009-0.013	65
	Duplex stainless steel	318-329, 400-446, DUPLEX	185-275 BHN	0.009-0.013	60
K	Malleable	A220-70003, A220-80002	200-320 BHN	0.03-0.1	120
	Grey	Grade 150 - 350,	200-320 BHN	0.03-0.1	120
	Nodular	A220, A436, A439, A602	200-320 BHN	0.03-0.1	120
N	Aluminium Alloys Si < 10%	6061 T6, 7075, 314-340, 380-390	< 120 BHN	0.04-0.2	600
	Aluminium Alloys Si > 10%	Mg Wisker	120-150 BHN	0.04-0.2	130
	Copper / Alloys	Alloyed Cu + Al + Fe, Ampco 18-25	180-220 BHN	0.04-0.2	200
S	Nickel Based	Monel 400, Hastelloy C, Inconel 625,718, Waspaloy	28-38HRc	0.009-0.013	40
	Titanium Alloys	6Al4V, 6Al4V-2Sn, Monel, Monel K	28-38HRc	0.009-0.013	40

2 FLUTE END MILLS



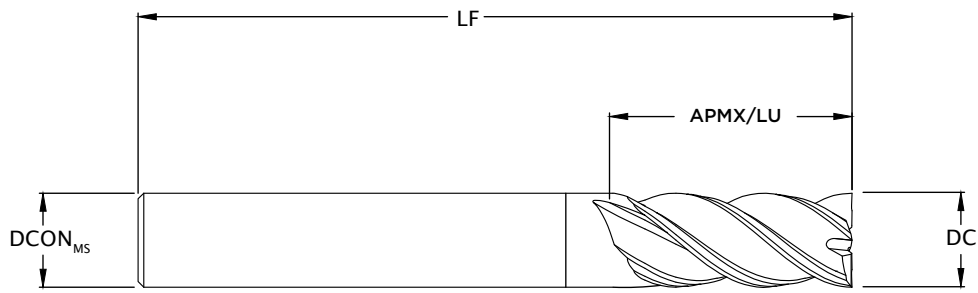
DC	Product Part Number	APMX /LU	ZEFP	DCONMS	LF
2	A2E-0200-06-050-2	6	2	2	50
3	A2E-0300-09-050-2	9	2	3	50
4	A2E-0400-10-050-2	10	2	4	50
5	A2E-0500-12-050-2	12	2	5	50
6	A2E-0600-15-057-2	15	2	6	57
8	A2E-0800-20-063-2	20	2	8	63
10	A2E-1000-25-072-2	25	2	10	72
12	A2E-1200-30-080-2	30	2	12	80
16	A2E-1600-06-092-2	40	2	16	92
20	A2E-2000-06-104-2	50	2	20	104

3 FLUTE END MILLS



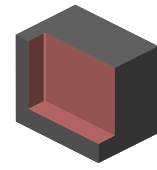
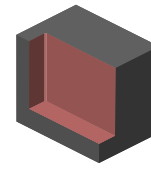
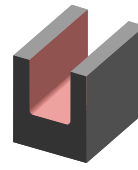
MATERIAL				FULL SLOTTING	SIDE FINISHING		
ISO	Description	Specifications	Hardness	fz (mm/rev)	Vc (m/min)	fz (mm/rev)	Vc (m/min)
P	Low Alloy Steel / Free Cutting	12L14, 12L15, 1030-1060, 1050-1060, 1144-1146	120-200 BHN	0.03-0.1	120	0.03-0.1	150
	Medium Alloy Steel	4140, 4340, 52100, 8620	200-240 BHN	0.03-0.1	100	0.03-0.1	140
	High Alloy Steel	4340, 4330V, 300M, etc,	225-300 BHN	0.03-0.1	80	0.03-0.1	120
H	Hardox	Hardox-500	52-60 HRc	0.03-0.05	45	0.05-0.08	55
M	Ferritic/martensitic stainless steel	416, 420, etc,	185-275 BHN	0.013-0.1	65	0.008-0.1	80
	Austenitic stainless steel	304, 316, 17-4PH, etc,	185-275 BHN	0.009-0.013	65	0.005-0.06	80
	Duplex stainless steel	318-329, 400-446, DUPLEX	185-275 BHN	0.009-0.013	60	0.005-0.06	80
K	Malleable	A220-70003, A220-80002	200-320 BHN	0.03-0.1	120	0.03-0.1	150
	Grey	Grade 150 - 350,	200-320 BHN	0.03-0.1	120	0.03-0.1	150
	Nodular	A220, A436, A439, A602	200-320 BHN	0.03-0.1	120	0.03-0.1	150
N	Aluminium Alloys Si < 10%	6061 T6, 7075, 314-340, 380-390	< 120 BHN	0.04-0.2	600	0.07-0.25	900
	Aluminium Alloys Si > 10%	Mg Wisker	120-150 BHN	0.04-0.2	130	0.07-0.25	130
	Copper / Alloys	Alloyed Cu + Al + Fe, Ampco 18-25	180-220 BHN	0.04-0.2	200	0.07-0.25	200
S	Nickel Based	Monel 400, Hastelloy C, Inconel 625,718, Waspaloy	28-38HRc	0.009-0.013	40	0.005-0.06	40
	Titanium Alloys	6Al4V, 6Al4V-2Sn, Monel, Monel K	28-38HRc	0.009-0.013	40	0.005-0.06	40

3 FLUTE END MILLS



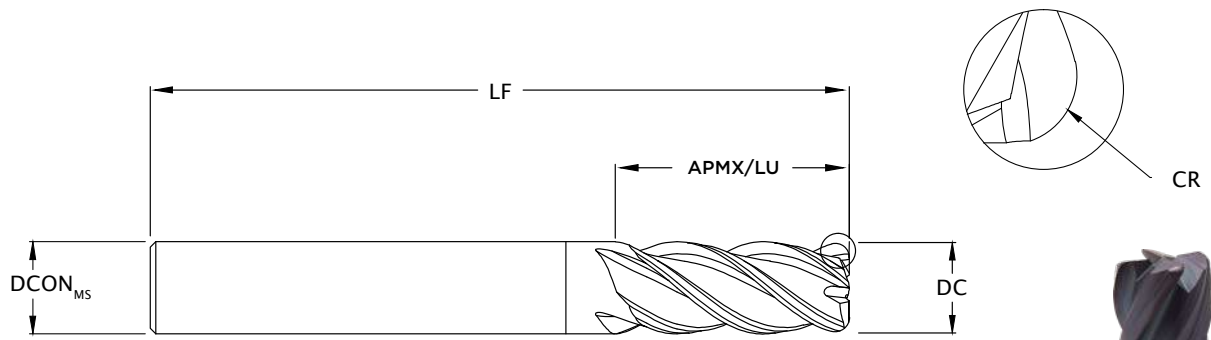
DC	Product Part Number	APMX /LU	ZEFP	DCONMS	LF
2	A3E-0200-06-050-3	6	3	2	50
3	A3E-0300-09-050-3	9	3	3	50
4	A3E-0400-10-050-3	10	3	4	50
5	A3E-0500-12-050-3	12	3	5	50
6	A3E-0600-15-057-3	15	3	6	57
8	A3E-0800-20-063-3	20	3	8	63
10	A3E-1000-25-072-3	25	3	10	72
12	A3E-1200-30-080-3	30	3	12	80
16	A3E-1600-06-092-3	40	3	16	92
20	A3E-2000-06-104-3	50	3	20	104

CORNER RADIUS END MILLS



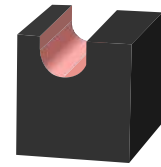
MATERIAL				FULL SLOTTING	SIDE ROUGHING	SIDE FINISHING			
ISO	Description	Specifications	Hardness	fz (mm/rev)	Vc (m/min)	fz (mm/rev)	Vc (m/min)	fz (mm/rev)	Vc (m/min)
P	Low Alloy Steel / Free Cutting	12L14, 12L15, 1030-1060, 1050-1060, 1144-1146	120-200 BHN	0.05-0.1	120	0.07-0.11	150	0.07-0.15	250
	Medium Alloy Steel	4140, 4340, 52100, 8620	200-240 BHN	0.05-0.1	100	0.07-0.11	140	0.07-0.15	200
	High Alloy Steel	4340, 4330V, 300M, etc,	225-300 BHN	0.05-0.1	80	0.07-0.11	120	0.07-0.15	180
H	Hardox	Hardox-500	52-60 HRc	0.03-0.05	45	0.05-0.08	55	0.03-0.05	60
M	Ferritic/martensitic stainless steel	416, 420, etc,	185-275 BHN	0.03-0.1	65	0.01-0.07	80	0.016-0.1	120
	Austenitic stainless steel	304, 316, 17-4PH, etc,	185-275 BHN	0.01-0.03	65	0.005-0.06	80	0.01-0.1	120
	Duplex stainless steel	318-329, 400-446, DUPLEX	185-275 BHN	0.01-0.03	60	0.005-0.06	80	0.01-0.1	80
K	Malleable	A220-70003, A220-80002	200-320 BHN	0.03-0.1	120	0.03-0.1	150	0.04-0.15	150
	Grey	Grade 150 - 350,	200-320 BHN	0.03-0.1	120	0.03-0.1	150	0.04-0.15	180
	Nodular	A220, A436, A439, A602	200-320 BHN	0.03-0.1	120	0.03-0.1	150	0.04-0.15	150
N	Aluminium Alloys Si < 10%	6061 T6, 7075, 314-340, 380-390	< 120 BHN	0.04-0.2	600	0.07-0.25	900	0.07-0.33	1000
	Aluminium Alloys Si > 10%	Mg Wisker	120-150 BHN	0.04-0.2	130	0.07-0.25	130	0.07-0.33	180
	Copper / Alloys	Alloyed Cu + Al + Fe, Ampco 18-25	180-220 BHN	0.04-0.2	200	0.07-0.25	200	0.07-0.33	250
S	Nickel Based	Monel 400, Hastelloy C, Inconel 625,718, Waspaloy	28-38HRc	0.009-0.013	40	0.005-0.06	40	0.01-0.12	60
	Titanium Alloys	6Al4V, 6Al4V-2Sn, Monel, Monel K	28-38HRc	0.009-0.013	40	0.005-0.06	40	0.01-0.12	60

CORNER RADIUS END MILLS



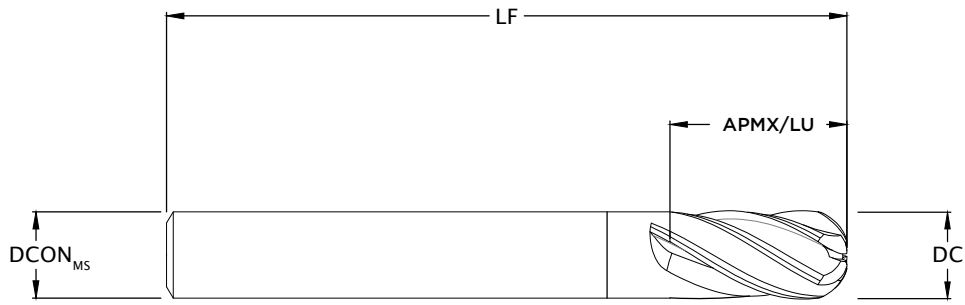
DC	Product Part Number	APMX /LU	CR	CR	CR	ZEFP	DCONMS	LF
3	ARE-0300-08-050-4	8	0.3	0.5		4	3	50
4	ARE-0400-10-050-4	10	0.3	0.5		4	4	50
5	ARE-0500-13-050-4	13	0.3	0.5		4	5	50
6	ARE-0600-15-057-4	15	0.3	0.5		4	6	57
8	ARE-0800-20-063-4	20	0.3	0.5	1	4	8	63
10	ARE-1000-25-072-4	25		0.5	1	4	10	72
12	ARE-1200-30-080-4	30		0.5	1	4	12	80
16	ARE-1600-40-092-4	40		0.5	1	4	16	92
20	ARE-2000-50-104-4	50			1	4	20	104

BALL NOSE END MILLS



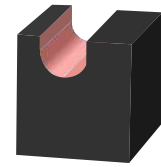
MATERIAL				PROFILING	
ISO	Description	Specifications	Hardness	fz (mm/rev)	Vc (m/min)
P	Low Alloy Steel / Free Cutting	12L14, 12L15, 1030-1060, 1050-1060, 1144-1146	120-200 BHN	0.1-0.2	150
	Medium Alloy Steel	4140, 4340, 52100, 8620	200-240 BHN	0.08-0.15	150
	High Alloy Steel	4340, 4330V, 300M, etc,	225-300 BHN	0.08-0.15	120
H	Hardox	Hardox-500	52-60 HRc	0.05-0.15	50-80
M	Ferritic/martensitic stainless steel	416, 420, etc,	185-275 BHN	0.08-0.12	80-120
	Austenitic stainless steel	304, 316, 17-4PH, etc,	185-275 BHN	0.08-0.12	80-100
	Duplex stainless steel	318-329, 400-446, DUPLEX	185-275 BHN	0.08-0.12	80-100
K	Malleable	A220-70003, A220-80002	200-320 BHN	0.08-0.15	150
	Grey	Grade 150 - 350,	200-320 BHN	0.05-0.1	100
	Nodular	A220, A436, A439, A602	200-320 BHN	0.05-0.1	150
N	Aluminium Alloys Si < 10%	6061 T6, 7075, 314-340, 380-390	< 120 BHN	0.1-0.2	600
	Aluminium Alloys Si > 10%	Mg Wisker	120-150 BHN	0.1-0.2	130
	Copper / Alloys	Alloyed Cu + Al + Fe, Ampco 18-25	180-220 BHN	0.1-0.2	500
S	Nickel Based	Monel 400, Hastelloy C, Inconel 625,718, Waspaloy	28-38HRc	0.009-0.013	40
	Titanium Alloys	6Al4V, 6Al4V-2Sn, Monel, Monel K	28-38HRc	0.009-0.013	40

BALL NOSE END MILLS



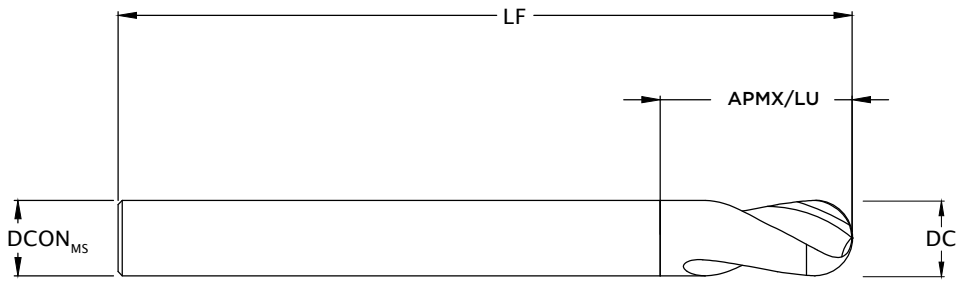
DC	Product Part Number	APMX /LU	ZEFP	DCONMS	LF
2	ABE-0200-06-050-2	6	2	4	50
3	ABE-0300-09-050-4	9	4	3	50
4	ABE-0400-10-050-4	10	4	4	50
5	ABE-0500-12-050-4	12	4	5	50
6	ABE-0600-15-057-4	15	4	6	57
8	ABE-0800-20-063-4	20	4	8	63
10	ABE-1000-25-072-4	25	4	10	72
12	ABE-1200-30-080-4	30	4	12	80
16	ABE-1600-40-092-4	40	4	16	92
20	ABE-2000-50-104-4	50	4	20	104

STUB BALL NOSE



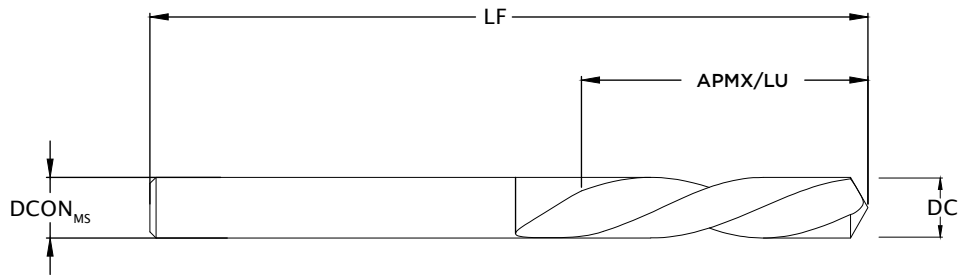
MATERIAL				PROFILING	
ISO	Description	Specifications	Hardness	fz (mm/rev)	Vc (m/min)
P	Low Alloy Steel / Free Cutting	12L14, 12L15, 1030-1060, 1050-1060, 1144-1146	120-200 BHN	0.1-0.2	150
	Medium Alloy Steel	4140, 4340, 52100, 8620	200-240 BHN	0.08-0.15	150
	High Alloy Steel	4340, 4330V, 300M, etc,	225-300 BHN	0.08-0.15	120
H	Hardox	Hardox-500	52-60 HRc	0.05-0.15	50-80
M	Ferritic/martensitic stainless steel	416, 420, etc,	185-275 BHN	0.08-0.12	80-120
	Austenitic stainless steel	304, 316, 17-4PH, etc,	185-275 BHN	0.08-0.12	80-100
	Duplex stainless steel	318-329, 400-446, DUPLEX	185-275 BHN	0.08-0.12	80-100
K	Malleable	A220-70003, A220-80002	200-320 BHN	0.08-0.15	150
	Grey	Grade 150 - 350,	200-320 BHN	0.05-0.1	100
	Nodular	A220, A436, A439, A602	200-320 BHN	0.05-0.1	150
N	Aluminium Alloys Si < 10%	6061 T6, 7075, 314-340, 380-390	< 120 BHN	0.1-0.2	600
	Aluminium Alloys Si > 10%	Mg Wisker	120-150 BHN	0.1-0.2	130
	Copper / Alloys	Alloyed Cu + Al + Fe, Ampco 18-25	180-220 BHN	0.1-0.2	500
S	Nickel Based	Monel 400, Hastelloy C, Inconel 625,718, Waspaloy	28-38HRc	0.009-0.013	40
	Titanium Alloys	6Al4V, 6Al4V-2Sn, Monel, Monel K	28-38HRc	0.009-0.013	40

STUB BALL NOSE



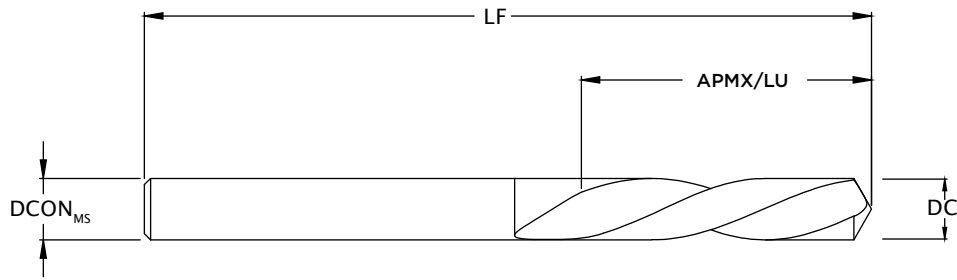
DC	Product Part Number	APMX /LU	ZEFP	DCONMS	LF
3	ASB-0300-03-057-4	3	2	3	57
4	ASB-0400-04-075-4	4	2	4	75
5	ASB-0500-05-075-4	5	2	5	75
6	ASB-0600-06-100-4	6	2	6	100
8	ASB-0800-08-100-4	8	2	8	100
10	ASB-1000-10-100-4	10	2	10	100
12	ASB-1200-12-110-4	12	2	12	110
16	ASB-1600-16-125-4	16	2	16	125
20	ASB-2000-20-125-4	20	2	20	125

STANDARD DRILL



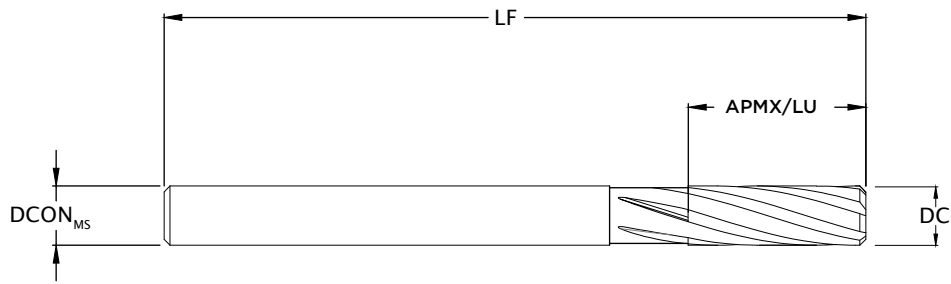
DC	APMX /LU	LF
2,0 - 2,3	12	40
2,4 - 2,6	14	43
2,7 - 2,9	16	46
3,0 - 3,3	18	46
3,4 - 3,8	20	52
3,9 - 4,2	22	55
4,3 - 4,7	24	58
4,8 - 5,3	26	62
5,4 - 6,0	28	66
6,1 - 6,7	31	70
6,8 - 7,5	34	74
7,6 - 8,5	37	79
8,6 - 9,5	40	84
9,6 - 10,5	43	89
11,0 -11,9	47	95
12,0 -13,0	51	102
13,0 -14,9	54	107
15,0 -15,5	56	111
15,6 - 16,0	58	115

LONG DRILLS



DC	APMX /LU	LF
3,0 - 3,7	28	66
3,8 - 4,7	36	74
4,8 - 6,0	44	82
6,1 - 8,0	53	91
8,1 - 10,0	61	103
10,1 - 12,0	71	118
12,5 - 14,0	77	124
14,5 - 18,0	83	133
18,1 - 20,0	101	153

REAMER



DC	Product Part Number	APMX /LU	DCONMR	ZEFP	DCONMS	LF
3	AFR-0300-15-057-4	15	2.8	4	3	57
4	AFR-0400-19-075-6	19	3.8	6	4	75
5	AFR-0500-23-075-6	23	4.8	6	5	75
6	AFR-0600-26-100-6	26	5.8	6	6	100
8	AFR-0800-33-100-6	33	7.8	6	8	100
10	AFR-1000-38-100-6	38	9.8	6	10	100
12	AFR-1200-44-110-6	44	11.8	6	12	110
14	AFR-1400-47-160-6	47	13.8	6	14	160
16	AFR-1600-52-170-6	52	15.8	6	16	170
20	AFR-2000-55-170-6	55	19.8	6	20	170

COATING PROPERTIES

COATINGS	COLOR	TECHNOLOGY	THICKNESS (μm)	HARDNESS (HV)	MAX OPERATION TEMP (°C)	COEFFICIENT OF FRICTION	APPLICATIONS
TiN	Golden Yellow	PVD	1 - 5	2000 - 2300	500	0.5 - 0.6	<ul style="list-style-type: none"> • Cutting tools, punches, pressing die and biomaterials.
CrN	Silver Gray	PVD	1 - 5	1500 - 2000	700	0.4 - 0.6	<ul style="list-style-type: none"> • Extrusion, stretching, sheet metal forming tools and machine components, etc. • Cutting tools for Cu and anti-sticking of semiconductor parts.
AlTiN	Black Purple	PVD	1 - 4	3000 - 3500	900	0.4 - 0.6	<ul style="list-style-type: none"> • High speed turning, milling and drilling process. • It is used for hard alloy and cast iron processing, especially in dry condition.
R7	Red Brown	PVD	1 - 4	2500 - 3000	800	0.4 - 0.6	<ul style="list-style-type: none"> • Mills and drills for steel products and stainless steel (HRC4° ↓). • It is especially suitable for non-continuity cutting in wet condition.
TiX-H	Metallic Golden	PVD	1 - 3	3800 - 4200	1100	0.5 - 0.6	<ul style="list-style-type: none"> • It can machine hard materials (HRC55° ↑) efficiently even at high temperature in dry condition.
AlTiCrN	Gray Black	PVD	1 - 5	2800 - 3200	900	0.4 - 0.5	<ul style="list-style-type: none"> • Recommended to extend the lifetime and corrosion resistance of tools. • Suitable for both wet and dry cutting conditions.
Rainbow Diamond	Bright Rainbow	PECVD	1 - 2	1000 - 1500	600	0.1 - 0.2	<ul style="list-style-type: none"> • Suitable for non-ferrous metal processing. • Al, Cu lead-free Cu and optical plastic machining, hard and soft PCB drilling, etc.
TA	Dark Rainbow	PVD + PECVD	1 - 5	3200 - 3500	900	0.1 - 0.2	<ul style="list-style-type: none"> • Can improve chips removal and be used for stainless steel (304 - 316) processing, hard Al alloy rough finishing.
TS	Golden Rainbow	PVD + PECVD	1 - 4	3800 - 4200	1100	0.1 - 0.2	<ul style="list-style-type: none"> • It can improve chips removal and be used for steel (HRC55° ↑), Ti, Ni, Cu alloy processing.
Me-DLC	Black	PVD	1 - 4	1800 - 2000	350	0.15 - 0.25	<ul style="list-style-type: none"> • Basic wear-resistant parts. • Gage, fixture, screwdriver and tools.
DLC	Black	PECVD	1 - 4	1800 - 2200	350	0.05 - 0.1	<ul style="list-style-type: none"> • CD-R disk mold, eye glass mold, mobile phone mold, semiconductor trimming die, plastic injection mold, IC molding mold, PM mold, aluminium extrusion mold, components of automobile and machines. • Cutting tools for Al(Mg) alloy, Cu alloy, plastic ceramics, composites.
Me/DLC	Black	PVD + PECVD	1 - 5	1800 - 3000	350	0.1 - 0.15	<ul style="list-style-type: none"> • Diesel injection, pressurization pump, cam shaft, piston and other automobile parts.
ta-C	Blue Rainbow	FCVA	0.1 - 1	4000 - 8000	500	0.05 - 0.1	<ul style="list-style-type: none"> • PCB micro-drilling, cutting tools. • Coating for heat dissipation in electronic component and biomaterials materials.
Ti(C, N)/Al ₂ O ₃	Dark Gray	Thermal CVD	5 - 15	2000 - 3000	1000	0.35 - 0.7	<ul style="list-style-type: none"> • Inserts/molds with groove, ditch, blind hole. • Especially used for punch pins, eye mold and trimming tools.
Diamond	Dark Black	HFCVD	0.5 - 20	7000 - 9000	600	0.2 - 0.3	<ul style="list-style-type: none"> • End mills for non-metallic materials (graphite, ceramic, composites, grass fiber, carbon fiber) and non-ferrous metal (Al, Cu) processing. • Coating for heat dissipation, semiconductor materials, electrochemical electrodes.

SOLID CARBIDE SPECIAL AND PROFILE TOOLS

Chamfer Cutter



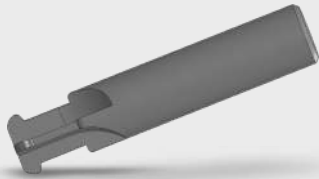
Counter Sunk Tool



Flaring Tool



Profile Cutter



Profile Drill



Roughing BN



Special Ball Nose



Special Pin



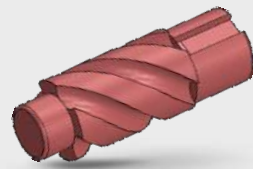
Taper End Mill



Special T Slot Cutter



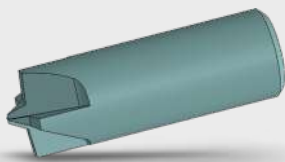
Special Carbide Core Cutter



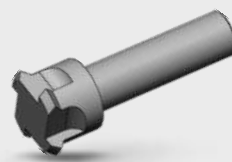
Back Boring Tool



Chamfer Tool



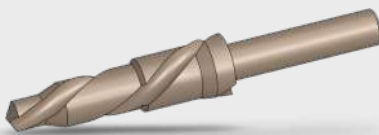
Chamfering Cutter



Step Drill



Special Chamfer Drill



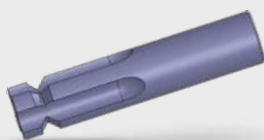
T Slot Profile Cutter



Back Chamfer T Slot



Special Cutter



Side Facing Tool



W Drill

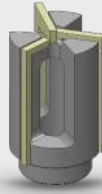


CARBIDE TIPPED BRAZED TOOLS

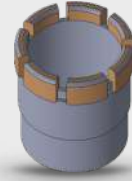
Brazed Ball Profile Cutter



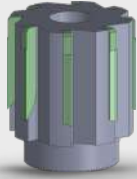
Brazed Flat Profile Cutter



Special Cutter



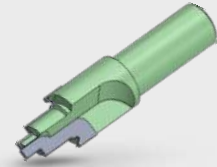
Spoiler Reamer



Special Reamer



Brazed Profile Tool



Profile Grooving Tool



T Slot Special Tool



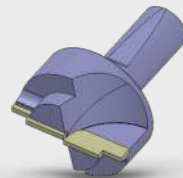
Spot Facing Tool



T Slot Brazed



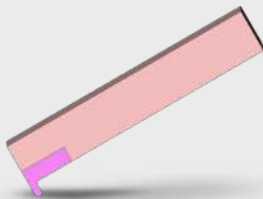
Brazed Profile Tool



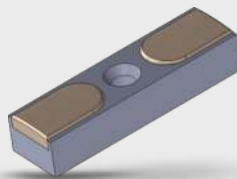
Special Stub End Mill



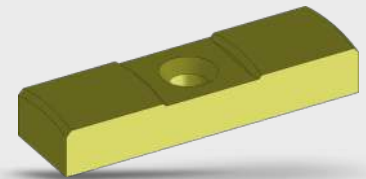
Face Grooving Tool



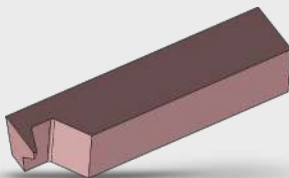
Guide Pads



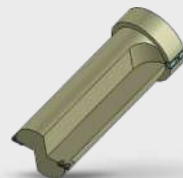
Carbide Guide Pad



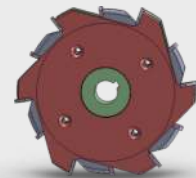
Special Grooving Tool



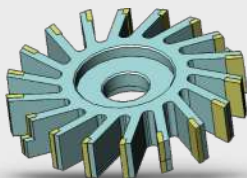
Adjustable Drill Head



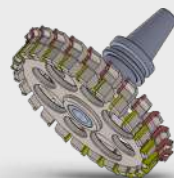
Special Wood Cutter



Spline Cutter



Profile Milling Cutter

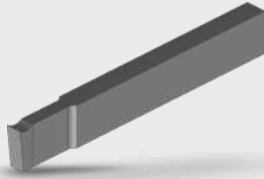


Brazed Special Drill



HOT TAPPING AND PILOT DRILLS

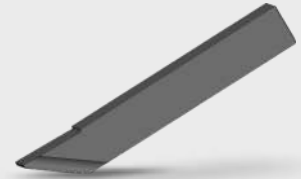
Parting Tool



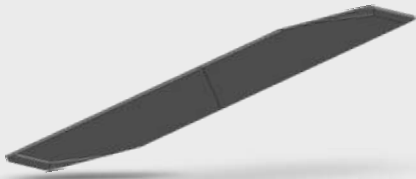
Parting Tool Brazed



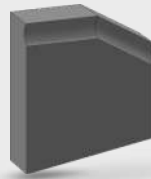
Bevel Tool



Double Side Bevel Tool



Bevel Tool



Pilot Drill Flanged



Threaded Pilot Drill



Customized Pilot Drill



Pilot Drill Flange Type



Special Drill Head



Taper Shank Drill Head



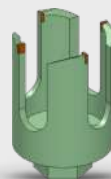
Special Profile Drill Head



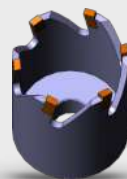
Annular Hot Tap Cutter



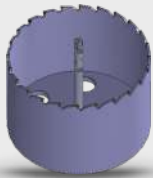
HDPE Cutter



Hole Saw Cutter



Hot Tapping Assembly



Multi Teeth Cutter



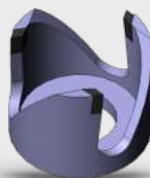
Customized Hot Tapping Cutter



Hot Tapping Cutter



Tank Cutter



Special Annular Cutter



HOLDERS AND MOUNTING HEADS



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