

IX Epoch Deep Ball TH3

IX-EPDB-TH3

Ball End Mill for Hardened Steel



MOLDINO Tool Engineering Europe GmbH

IX-EPDB-TH3 | 2025-09 | Version 1.0 | PDF

„IX“ changes the concept of carbide!



Features of IX-EPDB-TH3

01

Uses a new ultra-fine-grain carbide alloy to combine high wear and chipping resistance

02

Uses a TH3 coating for machining hardened steel, providing excellent wear and heat resistance

03

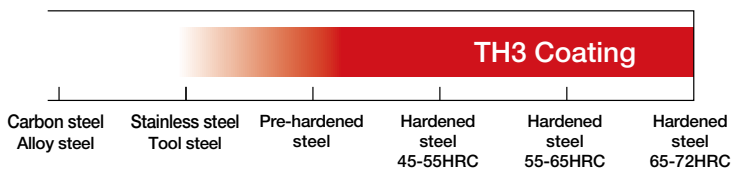
Greatly extends tool life, especially when machining 60HRC hardened steel

Line-up: 70 items

DC: 0.1–2 mm



Recommended usage



Application



Customer need and product benefit



Challenge

Carbide cutting tools for high hard machining, often experience chipping due to lower material toughness, resulting in lower tool life and surface quality. Machining hardened steels with a hardness of 60HRC or higher, present significant challenges regarding high heat and wear.



Solution

Our new "IX" concept changes carbide technology by utilizing a next-generation ultra-fine-grain carbide alloy that dramatically reduces chipping and enhances toughness. The IX-EPDB-TH3 features a specialized TH3 coating designed for machining hardened steel, offering excellent wear and heat resistance. The innovative flute design is optimized for high-hardened steels, effectively minimizing chipping during machining.

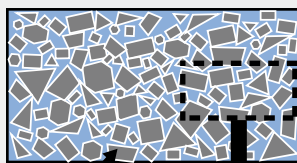
Feature

01

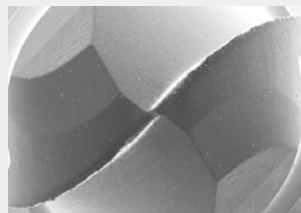
Next-generation carbide alloy for machining hardened steel

- Features refined material structure with approximately 10% greater hardness than conventional materials.
- Incorporates next-generation additive elements to combine high wear resistance (hardness) and chipping resistance (toughness).

Next-generation carbide alloy



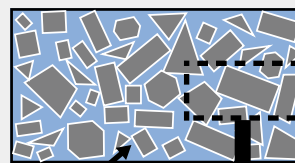
Tungsten carbide (WC)
Next-generation additive elements



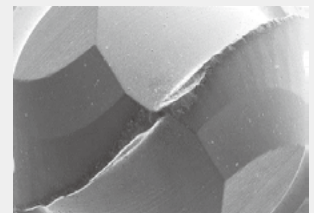
Dramatically reduces chipping.

Next-generation additive elements resist segregating around WC particles.
➔ **Increases carbide toughness.**

Conventional carbide alloy



Cobalt
Conventional additive elements



0.5mm

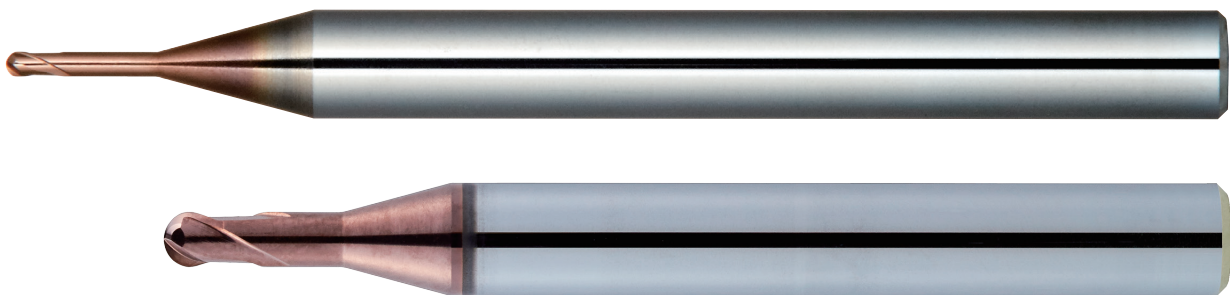
Notable chipping

Conventional additive elements segregate around WC particles.
➔ **Reduces carbide toughness.**

Tool: DC 2 mm | Under neck length 4 mm | Machine: Vertical MC (HSK-E32)

Work material: SLD (60HRC) | Coolant: Mist blow | Cutting time: 320 minutes

Cutting conditions: $n = 30,000 \text{ min}^{-1}$ | $V_c = 188 \text{ m/min}$ | $V_f = 3,000 \text{ mm/min}$ | $f_z = 0.05 \text{ mm/t}$ | $a_p \times a_e = 0.03 \text{ mm} \times 0.05 \text{ mm}$



Feature

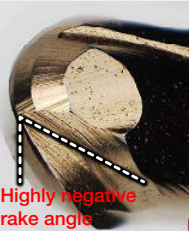
02

Special flute design for high-hardened steels

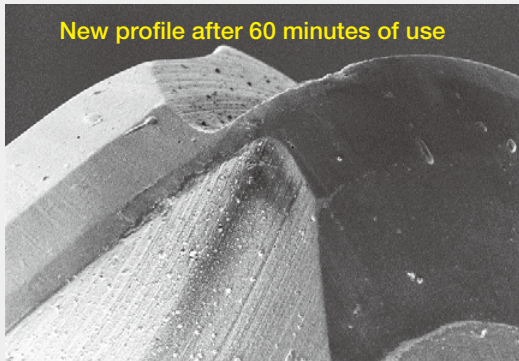
IX-EPDB-TH3



Thick chisel profile for outstanding durability

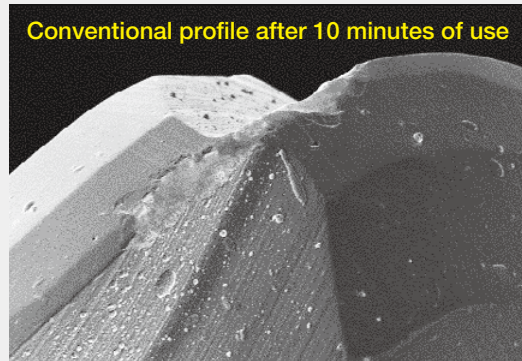


Highly negative rake angle



New profile after 60 minutes of use

Conventional



Conventional profile after 10 minutes of use

0.05mm

Tool: DC 0.6 mm | Under neck length 1.5 mm | Machine: Vertical MC (HSK-E32)
Work material: SLD (60HRC) | Coolant: Mist blow
Cutting conditions: $n = 40,000 \text{ min}^{-1}$ | $V_c = 75 \text{ m/min}$ | $V_f = 800 \text{ mm/min}$ | $f_z = 0.01 \text{ mm/t}$ | $a_p \times a_e = 0.005 \text{ mm} \times 0.01 \text{ mm}$

Effectively reduces chipping common when machining hardened steel.

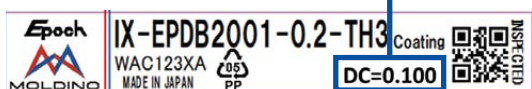
Feature

03

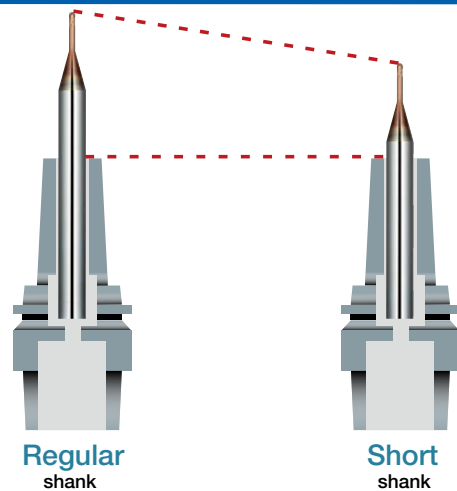
External diameter actual measurement label & short shank design

Allows use of actual size in CAM without the need for measurement, for improved machining accuracy!

Actual size indicated here

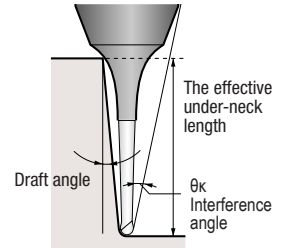
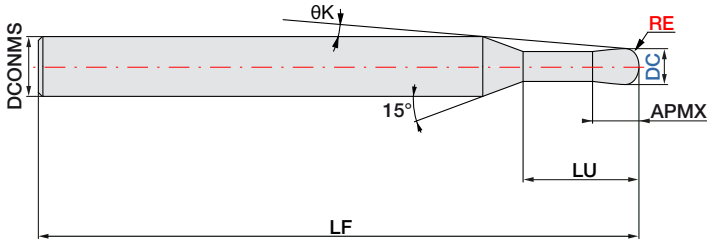
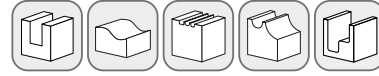


Example product label



Full-length design that fits shrink-fit holders

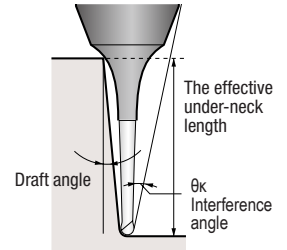
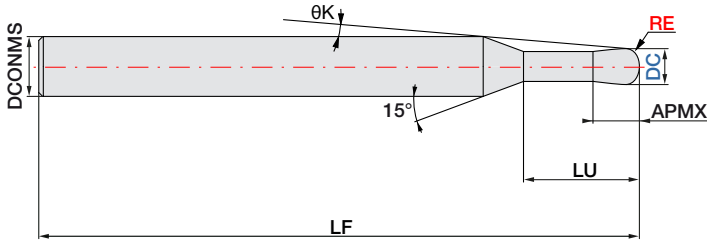
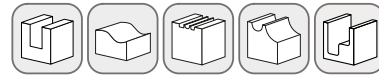
IX-EPDB-TH3 Line-Up



Helix Angle	Ball radius RE (mm)	RE Tolerance (mm)	DCONMS Tol.
DC ≤ 1: 25° DC > 1: 30°	RE ≤ 0.075	±0.002	h4
	0.075 < RE ≤ 0.45	±0.003	
	0.45 < RE	±0.005	

ID Code	Item Code	NOF	Size (mm)							0K (°)	Effective usage length with respect to draft angle (mm)				
			DC	RE	LU	APMX	DN	LF	DCONMS		0.5°	1°	1.5°	2°	3°
EP2724	IX-EPDB2001-0.2-TH3	2	0.1	0.05	0.2	0.08	0.09	35	4	14.66	0.22	0.23	0.23	0.24	0.25
EP2725	IX-EPDB2001-0.3-TH3	2	0.1	0.05	0.3	0.08	0.09	35	4	14.47	0.32	0.33	0.34	0.35	0.38
EP2726	IX-EPDB20015-0.3-TH3	2	0.15	0.075	0.3	0.12	0.14	35	4	14.51	0.32	0.33	0.34	0.35	0.37
EP2727	IX-EPDB20015-0.5-TH3	2	0.15	0.075	0.5	0.12	0.14	35	4	14.14	0.53	0.54	0.56	0.58	0.62
EP2728	IX-EPDB2002-0.3-TH3	2	0.2	0.1	0.3	0.15	0.19	35	4	14.54	0.32	0.33	0.34	0.35	0.37
EP2729	IX-EPDB2002-0.5-TH3	2	0.2	0.1	0.5	0.15	0.19	35	4	14.17	0.53	0.54	0.56	0.58	0.62
EP2730	IX-EPDB2002-0.6-TH3	2	0.2	0.1	0.6	0.15	0.19	35	4	13.99	0.63	0.65	0.67	0.69	0.74
EP2731	IX-EPDB2002-0.75-TH3	2	0.2	0.1	0.75	0.15	0.19	35	4	13.73	0.79	0.81	0.84	0.86	0.93
EP2732	IX-EPDB2002-1-TH3	2	0.2	0.1	1	0.15	0.19	38	4	13.32	1.04	1.08	1.11	1.15	1.24
EP2733	IX-EPDB2003-0.5-TH3	2	0.3	0.15	0.5	0.2	0.29	35	4	14.23	0.53	0.54	0.55	0.57	0.6
EP2734	IX-EPDB2003-0.75-TH3	2	0.3	0.15	0.75	0.2	0.29	35	4	13.78	0.78	0.81	0.83	0.86	0.92
EP2735	IX-EPDB2003-1-TH3	2	0.3	0.15	1	0.2	0.29	35	4	13.35	1.04	1.07	1.11	1.14	1.23
EP2736	IX-EPDB2003-1.5-TH3	2	0.3	0.15	1.5	0.2	0.29	38	4	12.58	1.56	1.61	1.66	1.72	1.85
EP2737	IX-EPDB2004-0.5-TH3	2	0.4	0.2	0.5	0.25	0.39	35	4	14.3	0.52	0.54	0.55	0.56	0.59
EP2738	IX-EPDB2004-0.75-TH3	2	0.4	0.2	0.75	0.25	0.39	35	4	13.83	0.78	0.8	0.83	0.85	0.9
EP2739	IX-EPDB2004-1-TH3	2	0.4	0.2	1	0.25	0.39	35	4	13.39	1.04	1.07	1.1	1.14	1.21
EP2740	IX-EPDB2004-1.5-TH3	2	0.4	0.2	1.5	0.25	0.39	38	4	12.59	1.56	1.61	1.66	1.71	1.84
EP2741	IX-EPDB2004-2-TH3	2	0.4	0.2	2	0.25	0.39	38	4	11.87	2.07	2.14	2.21	2.29	2.46
EP2742	IX-EPDB2004-2.5-TH3	2	0.4	0.2	2.5	0.25	0.39	38	4	11.24	2.59	2.68	2.77	2.86	3.08
EP2743	IX-EPDB2004-3-TH3	2	0.4	0.2	3	0.25	0.39	38	4	10.66	3.11	3.21	3.32	3.44	3.7
EP2744	IX-EPDB2004-4-TH3	2	0.4	0.2	4	0.25	0.39	38	4	9.67	4.14	4.28	4.43	4.59	4.94
EP2745	IX-EPDB2005-0.75-TH3	2	0.5	0.25	0.75	0.3	0.49	35	4	13.88	0.78	0.8	0.82	0.84	0.89
EP2746	IX-EPDB2005-1-TH3	2	0.5	0.25	1	0.3	0.49	35	4	13.42	1.04	1.07	1.1	1.13	1.2
EP2747	IX-EPDB2005-1.5-TH3	2	0.5	0.25	1.5	0.3	0.49	38	4	12.6	1.56	1.6	1.65	1.7	1.82
EP2748	IX-EPDB2005-2-TH3	2	0.5	0.25	2	0.3	0.49	38	4	11.87	2.07	2.14	2.21	2.28	2.45
EP2749	IX-EPDB2005-2.5-TH3	2	0.5	0.25	2.5	0.3	0.49	38	4	11.21	2.59	2.67	2.76	2.85	3.07
EP2750	IX-EPDB2005-3-TH3	2	0.5	0.25	3	0.3	0.49	38	4	10.63	3.11	3.21	3.31	3.43	3.69
EP2751	IX-EPDB2005-4-TH3	2	0.5	0.25	4	0.3	0.49	38	4	9.62	4.14	4.28	4.42	4.58	4.93
EP2752	IX-EPDB2006-0.75-TH3	2	0.6	0.3	0.75	0.35	0.58	35	4	13.9	0.8	0.82	0.84	0.86	0.9
EP2753	IX-EPDB2006-1-TH3	2	0.6	0.3	1	0.35	0.58	35	4	13.43	1.06	1.08	1.11	1.14	1.21
EP2754	IX-EPDB2006-1.5-TH3	2	0.6	0.3	1.5	0.35	0.58	35	4	12.58	1.57	1.62	1.67	1.72	1.84
EP2755	IX-EPDB2006-2-TH3	2	0.6	0.3	2	0.35	0.58	38	4	11.83	2.09	2.15	2.22	2.29	2.46
EP2756	IX-EPDB2006-2.5-TH3	2	0.6	0.3	2.5	0.35	0.58	38	4	11.16	2.61	2.69	2.78	2.87	3.08
EP2757	IX-EPDB2006-3-TH3	2	0.6	0.3	3	0.35	0.58	38	4	10.57	3.12	3.22	3.33	3.44	3.7
EP2758	IX-EPDB2006-4-TH3	2	0.6	0.3	4	0.35	0.58	38	4	9.54	4.16	4.29	4.44	4.59	4.94
EP2759	IX-EPDB2006-5-TH3	2	0.6	0.3	5	0.35	0.58	42	4	8.7	5.19	5.36	5.55	5.74	6.19
EP2760	IX-EPDB2006-6-TH3	2	0.6	0.3	6	0.35	0.58	42	4	7.99	6.23	6.43	6.65	6.89	7.43

IX-EPDB-TH3 Line-Up



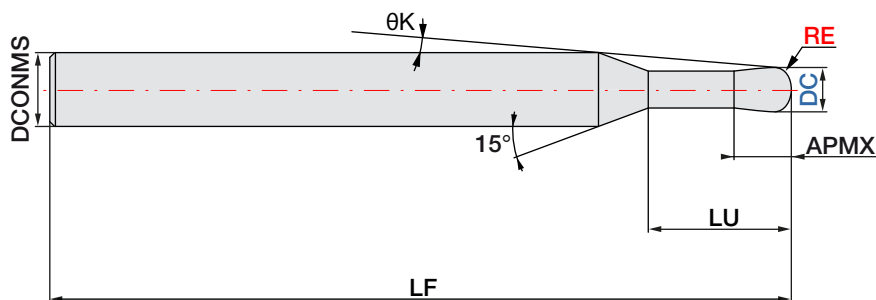
Helix Angle	Ball radius RE (mm)	RE Tolerance (mm)	DCONMS Tol.
DC ≤ 1: 25° DC > 1: 30°	RE ≤ 0.075	±0.002	h4
	0.075 < RE ≤ 0.45	±0.003	
	0.45 < RE	±0.005	

ID Code	Item Code	NOF	Size (mm)							0K (°)	Effective usage length with respect to draft angle (mm)				
			DC	RE	LU	APMX	DN	LF	DCONMS		0.5°	1°	1.5°	2°	3°
EP2761	IX-EPDB2008-1-TH3	2	0.8	0.4	1	0.45	0.78	35	4	13.51	1.05	1.08	1.1	1.13	1.19
EP2762	IX-EPDB2008-2-TH3	2	0.8	0.4	2	0.45	0.78	38	4	11.81	2.09	2.15	2.21	2.28	2.43
EP2763	IX-EPDB2008-2.5-TH3	2	0.8	0.4	2.5	0.45	0.78	38	4	11.11	2.6	2.68	2.76	2.85	3.05
EP2764	IX-EPDB2008-4-TH3	2	0.8	0.4	4	0.45	0.78	38	4	9.42	4.15	4.29	4.43	4.58	4.92
EP2765	IX-EPDB2008-5-TH3	2	0.8	0.4	5	0.45	0.78	42	4	8.55	5.19	5.36	5.54	5.73	6.16
EP2766	IX-EPDB2008-6-TH3	2	0.8	0.4	6	0.45	0.78	42	4	7.82	6.22	6.43	6.64	6.88	7.41
EP2767	IX-EPDB2008-8-TH3	2	0.8	0.4	8	0.45	0.78	42	4	6.69	8.29	8.56	8.86	9.18	9.89
EP2768	IX-EPDB2010-1.5-TH3	2	1	0.5	1.5	0.7	0.97	35	4	12.6	1.59	1.62	1.67	1.71	1.81
EP2769	IX-EPDB2010-2-TH3	2	1	0.5	2	0.7	0.97	35	4	11.75	2.1	2.16	2.22	2.29	2.43
EP2770	IX-EPDB2010-3-TH3	2	1	0.5	3	0.7	0.97	38	4	10.36	3.14	3.23	3.33	3.44	3.68
EP2771	IX-EPDB2010-4-TH3	2	1	0.5	4	0.7	0.97	38	4	9.26	4.17	4.3	4.44	4.59	4.92
EP2772	IX-EPDB2010-5-TH3	2	1	0.5	5	0.7	0.97	38	4	8.37	5.2	5.37	5.55	5.74	6.16
EP2773	IX-EPDB2010-6-TH3	2	1	0.5	6	0.7	0.97	42	4	7.63	6.24	6.44	6.65	6.88	7.41
EP2774	IX-EPDB2010-8-TH3	2	1	0.5	8	0.7	0.97	42	4	6.49	8.31	8.58	8.87	9.18	9.89
EP2775	IX-EPDB2010-10-TH3	2	1	0.5	10	0.7	0.97	45	4	5.64	10.37	10.72	11.09	11.48	12.38
EP2776	IX-EPDB2010-12-TH3	2	1	0.5	12	0.7	0.97	45	4	4.99	12.44	12.86	13.3	13.78	14.86
EP2777	IX-EPDB2015-2-TH3	2	1.5	0.75	2	1.25	1.46	35	4	11.64	2.11	2.16	2.21	2.27	2.4
EP2778	IX-EPDB2015-4-TH3	2	1.5	0.75	4	1.25	1.46	38	4	8.82	4.18	4.3	4.43	4.57	4.88
EP2779	IX-EPDB2015-5-TH3	2	1.5	0.75	5	1.25	1.46	38	4	7.87	5.22	5.37	5.54	5.72	6.13
EP2780	IX-EPDB2015-6-TH3	2	1.5	0.75	6	1.25	1.46	38	4	7.1	6.25	6.44	6.65	6.87	7.37
EP2781	IX-EPDB2015-8-TH3	2	1.5	0.75	8	1.25	1.46	42	4	5.93	8.32	8.58	8.86	9.17	9.86
EP2782	IX-EPDB2015-10-TH3	2	1.5	0.75	10	1.25	1.46	42	4	5.09	10.38	10.72	11.08	11.47	12.34
EP2783	IX-EPDB2015-12-TH3	2	1.5	0.75	12	1.25	1.46	45	4	4.46	12.45	12.86	13.3	13.77	14.83
EP2784	IX-EPDB2020-2.5-TH3	2	2	1	2.5	1.6	1.95	35	4	10.46	2.64	2.7	2.76	2.83	2.98
EP2785	IX-EPDB2020-3-TH3	2	2	1	3	1.6	1.95	35	4	9.6	3.16	3.23	3.32	3.4	3.6
EP2786	IX-EPDB2020-4-TH3	2	2	1	4	1.6	1.95	35	4	8.24	4.19	4.3	4.42	4.55	4.85
EP2787	IX-EPDB2020-6-TH3	2	2	1	6	1.6	1.95	38	4	6.42	6.26	6.44	6.64	6.85	7.33
EP2788	IX-EPDB2020-8-TH3	2	2	1	8	1.6	1.95	42	4	5.25	8.33	8.58	8.86	9.15	9.82
EP2789	IX-EPDB2020-10-TH3	2	2	1	10	1.6	1.95	42	4	4.44	10.39	10.72	11.07	11.45	12.31
EP2790	IX-EPDB2020-12-TH3	2	2	1	12	1.6	1.95	45	4	3.85	12.46	12.86	13.29	13.75	14.79
EP2791	IX-EPDB2020-14-TH3	2	2	1	14	1.6	1.95	45	4	3.39	14.53	15	15.51	16.05	17.28
EP2792	IX-EPDB2020-16-TH3	2	2	1	16	1.6	1.95	50	4	3.03	16.6	17.14	17.72	18.35	19.76
EP2793	IX-EPDB2020-20-TH3	2	2	1	20	1.6	1.95	55	4	2.5	20.73	21.42	22.16	22.95	No interference

IX-EPDB-TH3 General technical information

ISO 513 Symbol	Description	Examples
P	Non-alloy steel, low alloy steel, high alloy steel, ferritic/martensitic stainless steel, tool steel	1.2343 / X38CrMoV5-1; 1.2738 / 40CrMnNiMo8; 1.0503 / C45; 1.0570 / ST52-3; 1.1730 / C45W; 1.7131 / 16MnCr5; 1.7225 / 42CrMo4; 1.3343 / HS6-5-2; 1.0511 / C40; 1.2312 / 40CrMnMoS8-6; 1.2311 / 40CrMnMo7; 1.2344 / X40CrMoV5-1; 1.2767 / X45NiCrMo4; 1.2083 / X42Cr13; 1.2085 / X33CrS16; 1.2714 / 55NiCrMoV7; 1.2842 / 90MnCrV8;
M	Austenitic stainless steel	1.4301 / X5CrNi18-9; 1.4401 / X5CrNiMo17-12-2; 1.4404 / X2CrNiMo17-13-2; 1.4828 / X15CrNiSi20 12
K	Grey cast iron (GG), nodular cast iron (GGG), malleable cast iron	0.6025 / GG-25; GGG-40.3; 0.8155 / GTS-55-04
N	Aluminum wrought all, copper alloy, aluminum-cast, alloyed, non-metallic	2.0060 / E-Cu57; 2.0321 / CuZn37; 3.0255 / Al99.5; 3.5103 / MgSE3Zn27r1
S	High temperature alloys, titanium and Ti alloys	1.4864 / X12NiCrSi36 16; 2.4856 / NiCr22Mo9Nb; 1.4977 / X40CoCrNi20 20; 2.4669 / NiCr15Fe7TiAl
H	Hardened steel, chilled cast iron, cast iron	

Recommended						Suitable						NOT recommended					
P	M	K	N	S	H	P	M	K	N	S	H	P	M	K	N	S	H



Drawing Nomenclature	
DC	Cutting Diameter
RE	Radius Edge
APMX	Cutting Edge Length
LU	Usable Length
LF	Functional Length
DCONMS	Connection Diameter Machine Side
DN	Neck Diameter
θK	Interference Angle

Attentions on Safety

1. Cautions regarding handling

- (1) When removing the tool from its case (packaging), be careful that the tool does not pop out or is dropped. Be particularly careful regarding contact with the tool flutes.
- (2) When handling tools with sharp cutting flutes, be careful not to touch the cutting flutes directly with your bare hands.

2. Cautions regarding mounting

- (1) Before use, check the outside appearance of the tool for scratches, cracks, etc. and that it is firmly mounted in the collet chuck, etc.
- (2) When preparing for use, be sure that the inserts are firmly mounted in place and that they are firmly mounted on the arbor, etc.
- (3) If abnormal chattering, etc. occurs during use, stop the machine immediately and remove the cause of the chattering.

3. Cautions during use

- (1) Before use, confirm the dimensions and direction of rotation of the tool and milling work material.
- (2) The numerical values in the standard cutting conditions table should be used as criteria when starting new work. The cutting conditions should be adjusted as appropriate when the cutting depth is large, the rigidity of the machine being used is low, or according to the conditions of the work material.
- (3) Cutting tools are made of a hard material. During use, they may break and fly off. In addition, cutting chips may also fly off. Since there is a danger of injury to workers, fire, or eye damage from such flying pieces, a safety cover should be attached when work is performed and safety equipment such as safety goggles should be worn to create a safe environment for work.
- (4) There is a risk of fire or inflammation due to sparks, heat due to breakage, and cutting chips. Do not use where there is a risk of fire or explosion. Please caution of fire while using oil base coolant, fire prevention is necessary.
- (5) Do not use the tool for any purpose other than that for which it is intended.

4. Cautions regarding regrinding

- (1) If regrinding is not performed at the proper time, there is a risk of the tool breaking. Replace the tool with one in good condition, or perform regrinding.
- (2) Grinding dust will be created when regrinding a tool. When regrinding, be sure to attach a safety cover over the work area and wear safety clothes such as safety goggles, etc.
- (3) This product contains the specified chemical substance cobalt and its inorganic compounds. When performing regrinding or similar processing, be sure to handle the processing in accordance with the local laws and regulations regarding prevention of hazards due to specified chemical substances.

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The diagrams and table data are examples of test results and are not guaranteed values.

For more details please check our digital tool database



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