

Multi-purpose 3-flute ball end mill

EMBE/EMBPE

Epoch Mega Feed Ball (Pencil) Evolution-ATH



MOLDINO Tool Engineering Europe GmbH

Multi-purpose 3-flute ball end mill for good efficiency in deep areas

Features of EMBE-ATH/EMBPE-ATH

01 New high-helix edge shape

02 Unequal pitch geometry

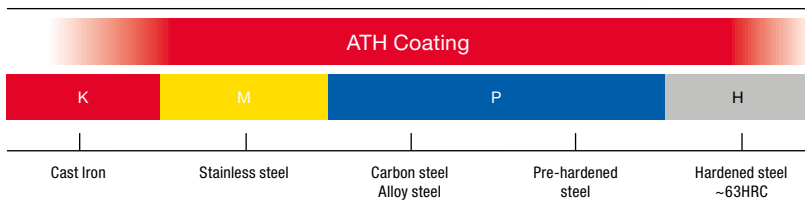
03 Improved R-tolerance

Line-up: EMBE 9 items / EMBPE 15 items

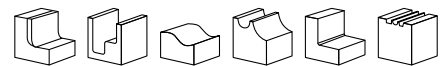
DC: 1 – 12 mm



Recommended usage

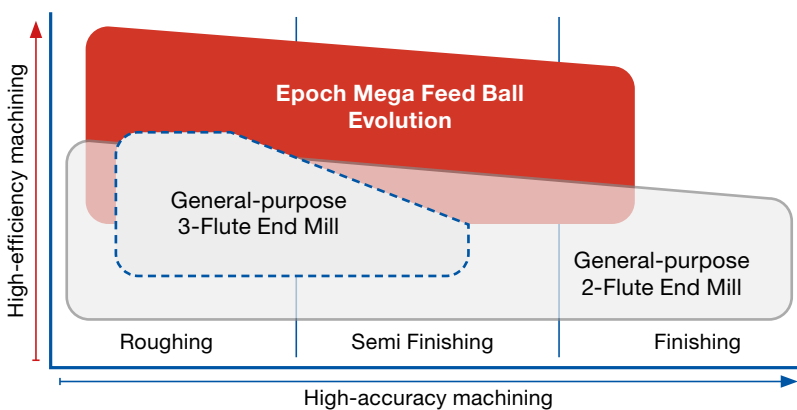


Applications



Customer need and product benefit

Multi-purpose ball end mill with good relation between accuracy and productivity.



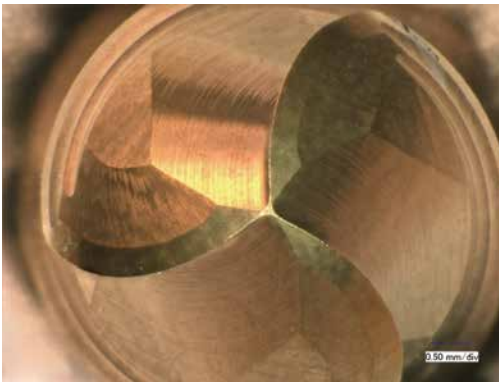
Challenge

Good surfaces with high productivity in deep areas.

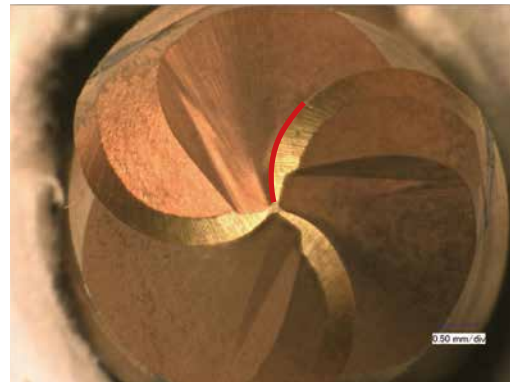
Solution

Efficient and accurate machining from roughing to finishing with EMBE. Deep area machining with pencil neck version EMBPE.

Feature **01** High-helix edge shape



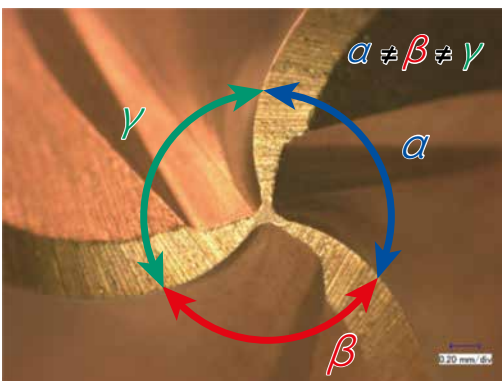
Evolution



Evolution:

- Strong S-curve provides less cutting force and better chip evacuation.
- Chip space optimization around tip point.
- Smooth connection between ball radius and peripheral cutting edge for efficient side milling.

Feature **02** Unequal pitch geometry



Can reduce chattering vibration in case of deep cutting or corner part processing. Especially effective in case of high-speed-cutting.

Feature **03** Improved R-tolerance

DC	Old tolerance	New tolerance
1 – 3	± 0.01	± 0.005
4 – 6	± 0.01	± 0.007
8 – 12	± 0.01	± 0.01

Evolution

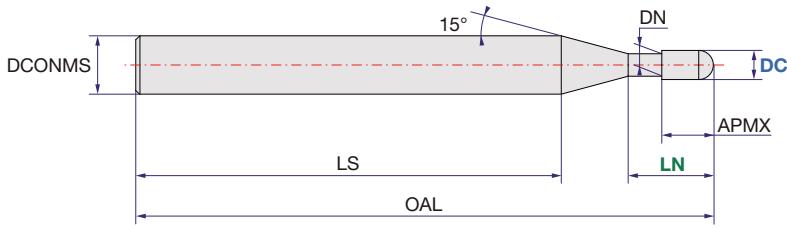
EMBE-ATH Epoch Mega Feed Ball Evolution

3 Flutes
Helix 40°
h5
Carbide
ATH coated
63 HRC

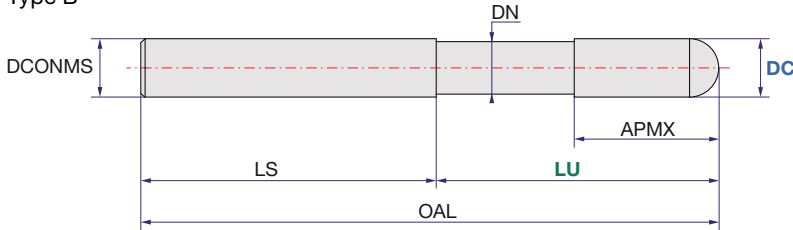
P
M
K

N
S
H

Type A



Type B



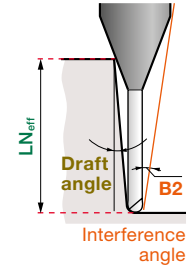
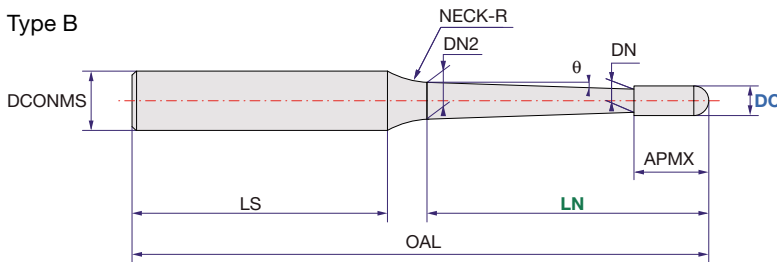
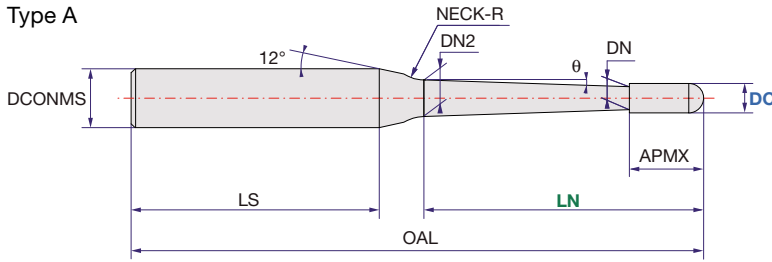
DC (mm)	R-tolerance (mm)
1 - 3	± 0.005
4 - 6	± 0.007
8 - 12	± 0.01

ID Code	Item Code	Stock	Size (mm)							
			DC	APMX	LN/LU	DN	LS	OAL	DCONMS	Type
EP2105	EMBE-3010-S6-ATH	●	1	1.5	3	0.95	37.6	50	6	A
EP2109	EMBE-3020-S6-ATH	●	2	3	6	1.9	36.4	50	6	A
EP2113	EMBE-3030-S6-ATH	●	3	4.5	9	2.9	55.3	70	6	A
EP2117	EMBE-3040-S6-ATH	●	4	6	12	3.9	54.1	70	6	A
EP2118	EMBE-3050-ATH	●	5	7.5	15	4.7	62.6	80	6	A
EP2119	EMBE-3060-ATH	●	6	9	18	5.7	72.0	90	6	B
EP2120	EMBE-3080-ATH	●	8	12	24	7.6	76.0	100	8	B
EP2121	EMBE-3100-ATH	●	10	15	30	9.5	70.0	100	10	B
EP2122	EMBE-3120-ATH	●	12	18	36	11.5	74.0	110	12	B

● Stock Item

EMBE-ATH Epoch Mega Feed Ball Evolution Pencil Neck

3 Flutes Helix 40° h5 Carbide ATH coated 63 HRC

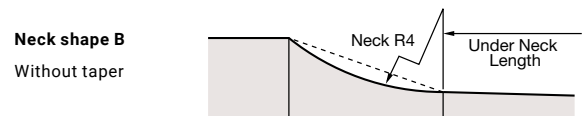
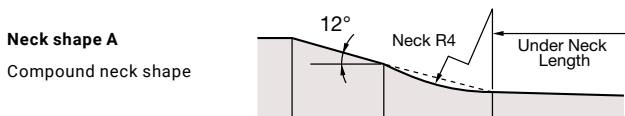


DC (mm)	R-tolerance (mm)
4 - 6	± 0.07
8 - 10	± 0.01

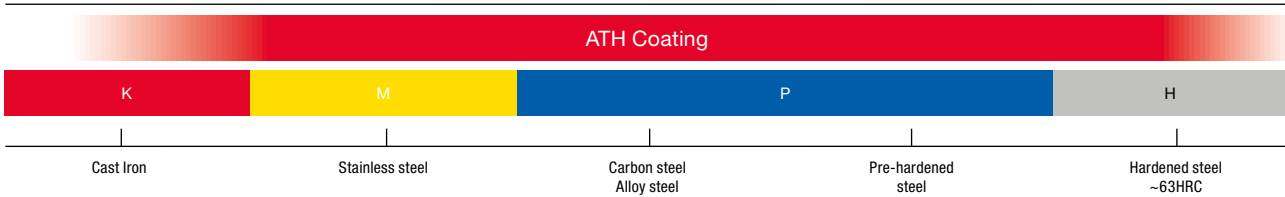
ID Code	Item Code	Stock	Size (mm)										LN _{eff} (mm)				
			DC	APMX	LN	DN	θ	DN2	LS	OAL	DCONMS	Type	B2	0.75°	1°	1.5°	2°
EP2184	EMBPE-3040-30-09-ATH	●	4	6	30	3.9	0.9	4.654	46.9	80	6	A	1.84	30.61	31.19	32.18	-
EP2185	EMBPE-3040-40-09-ATH	●	4	6	40	3.9	0.9	4.968	48.1	90	6	B	1.42	40.38	41.25	-	-
EP2186	EMBPE-3040-50-09-ATH	●	4	6	50	3.9	0.9	5.282	48.4	100	6	B	1.16	45.15	51.3	-	-
EP2187	EMBPE-3040-60-09-ATH	●	4	6	60	3.9	0.9	5.596	48.8	110	6	B	0.97	45.15	-	-	-
EP2191	EMBPE-3050-40-09-ATH	●	5	8	40	4.9	0.9	5.921	45.2	90	8	A	2.03	40.54	41.29	42.8	44.78
EP2193	EMBPE-3050-60-09-ATH	●	5	8	60	4.9	0.9	6.549	46.6	110	8	A	1.42	51.67	61.4	-	-
EP2198	EMBPE-3060-50-09-ATH	●	6	9	50	5.9	0.9	7.188	48.3	100	8	B	1.18	50.46	51.39	-	-
EP2199	EMBPE-3060-60-09-ATH	●	6	9	60	5.9	0.9	7.502	48.7	110	8	B	0.99	58.18	-	-	-
EP2200	EMBPE-3060-70-09-ATH	●	6	9	70	5.9	0.9	7.816	44.9	120	10	A	1.59	58.18	71.48	74.54	-
EP2201	EMBPE-3060-80-09-ATH	●	6	9	80	5.9	0.9	8.130	45.7	130	10	A	1.41	58.18	81.53	-	-
EP2206	EMBPE-3080-60-09-ATH	●	8	12	60	7.9	0.9	9.408	58.5	120	10	B	1.00	60.53	-	-	-
EP2207	EMBPE-3080-70-09-ATH	●	8	12	70	7.9	0.9	9.722	59.0	130	10	B	0.86	70.22	-	-	-
EP2208	EMBPE-3080-80-09-ATH	●	8	12	80	7.9	0.9	10.036	55.4	140	12	A	1.43	71.21	81.6	-	-
EP2212	EMBPE-3100-60-09-ATH	●	10	15	60	9.9	0.9	11.313	68.4	130	12	B	1.02	60.76	61.59	-	-
EP2213	EMBPE-3100-75-09-ATH	●	10	15	75	9.9	0.9	11.785	64.1	140	12	B	0.81	75.49	-	-	-

● Stock Item

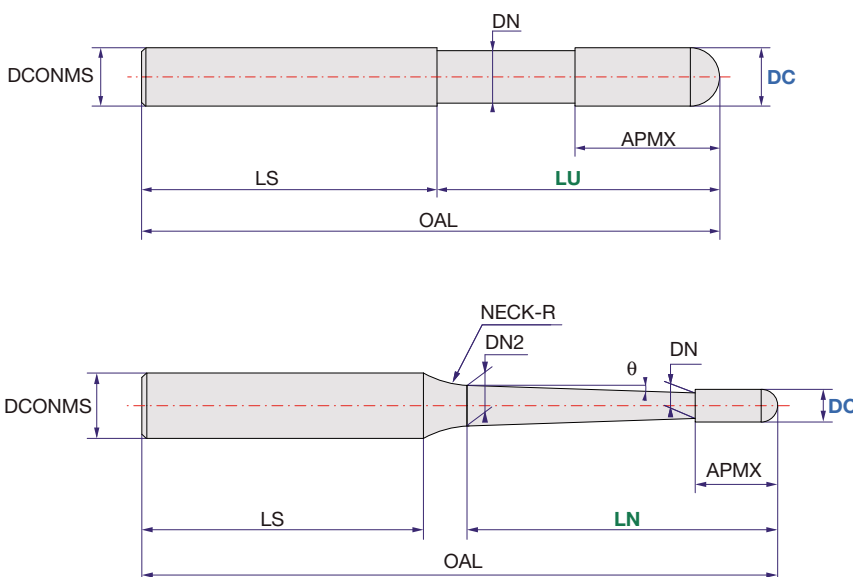
Detail of neck shape, EMBPE only



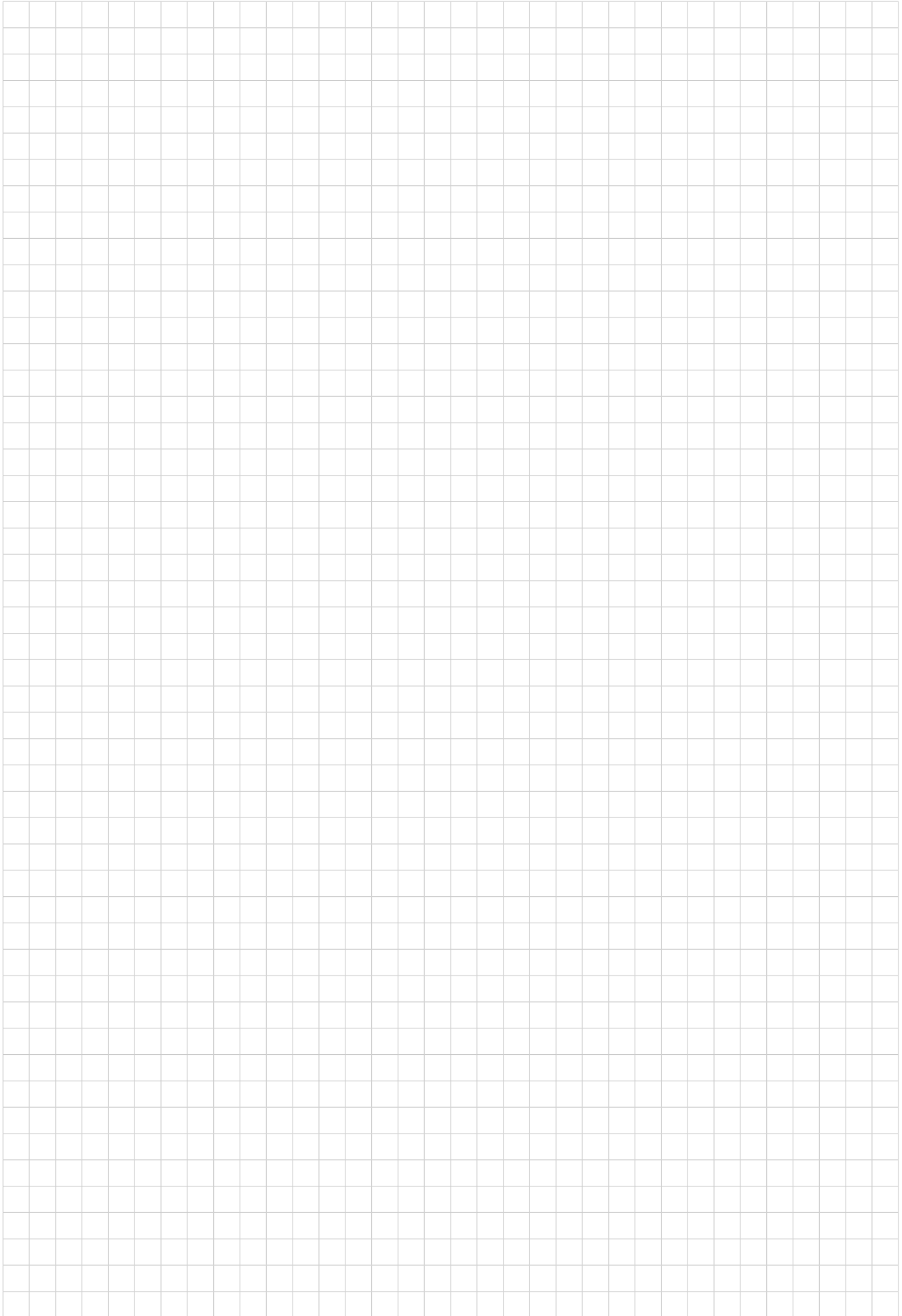
EMBE/EMBPE General technical information



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-ferrous	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	



Drawing nomenclature (mm)	
APMX	Cutting edge length
DC	Diameter cutting
DCONMS	Connection diameter
DN	Neck diameter
LN	Underneck length
LS	Shaft length
LU	Usable length
OAL	Overall length



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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For more details please check our digital tool database



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