

Radius mill TD6N type

TD6N



MOLDINO Tool Engineering Europe GmbH

High-feed 6-corner indexable cutter for maximized material removal

Line-up: 8 bodies, 3 insert types and grades

DCX: 52 – 125 mm

Varieties: more than 70 possible combinations

Features of TD6N

01

High-feed and high-depth insert types

02

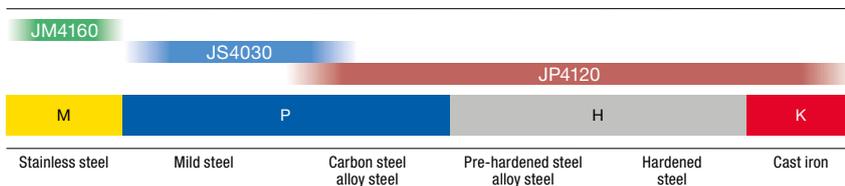
High strength 6-corner insert geometry

03

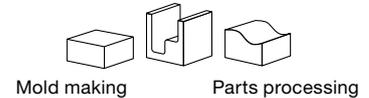
Optimized insert-radius-design



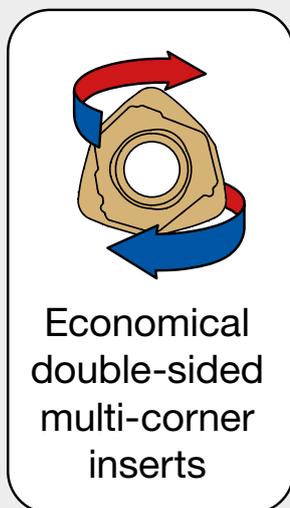
Recommended usage



Applications



Customer need and product benefit



Need for maximized productivity with safe and economic processing in Mold & Die industries.

Challenge

High volume roughing operations with maximized process safety and minimized cost per cutting edge.

Solution

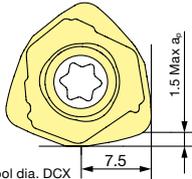
High-efficiency machining with TD6N

- Reduced processing time and cost
- Enhanced process safety and tool life
- Optimized cost per cutting edge

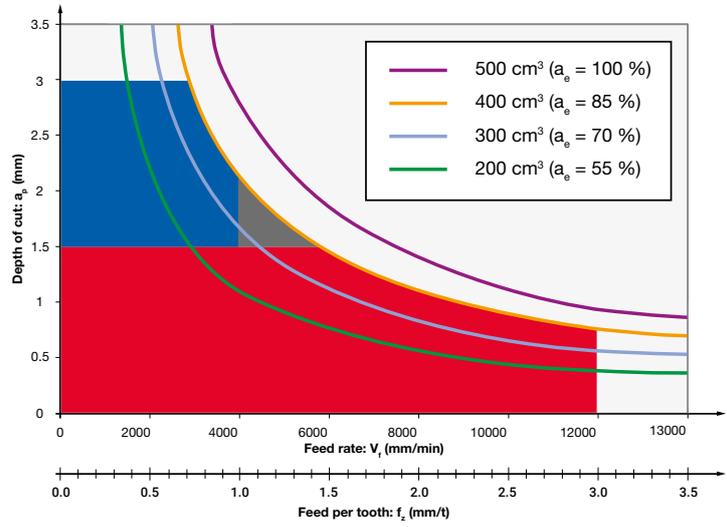
Features **01** High-feed and high-depth insert types

High-feed Inserts
FC Type - General Usage
FB Type - Low force

CAM R 3

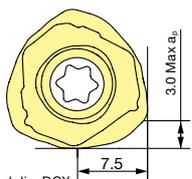


Max a_p : 1.5 mm
High-speed machining center



High-depth Inserts
HC Type

CAM R 4

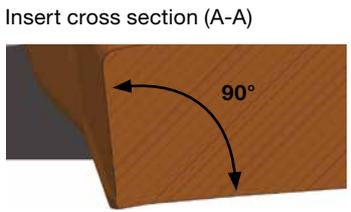
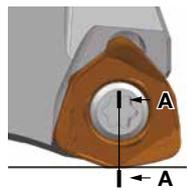


Max a_p : 3.0 mm
High-rigidity machining center



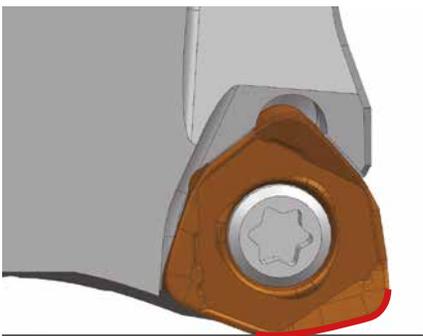
“High-feed type” and “high depth type” inserts can be set in all cutter body of TD6N!

Features **02** High-strength 6-corner insert geometry



- Negative geometry/high toughness substrate**
- High process safety in interrupted cutting
 - High cutting edge strength
 - Reduced chipping

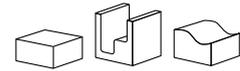
Features **03** Optimized insert-radius-design



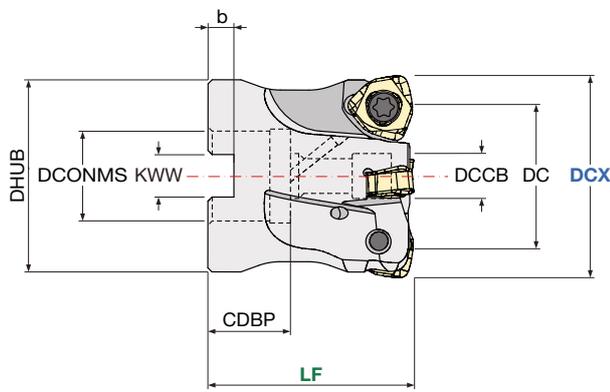
- Cutting edge shape**
- Constant cutting thickness
 - High-feed machining

TD6N Radius mill TD6N type

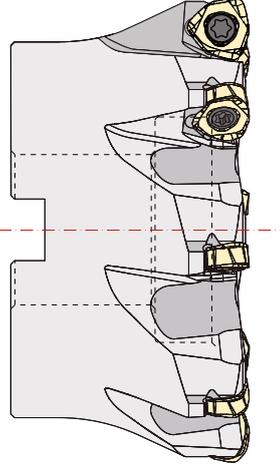
3-8 Rake angle negative 50 HRC



Type 1



Type 2

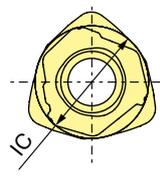


Diameter holder only	
-0.15 / -0.25 mm	
CAM radius	Fastening torque
3 mm / 4 mm	4.9 Nm

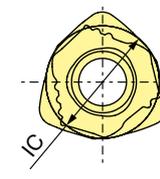
ID code	Item code	z	Size (mm)									Body type	Inner cooling
			DCX	DCONMS	DHUB	LF	CDBP	KWW	b	DC	DCCB		
FH300	TD6N-5052BM-3-22	3	52	22	48	50	20.0	10.4	6.3	37	11	1	●
FH301	TD6N-5052BM-4-22	4	52	22	48	50	20.0	10.4	6.3	37	11	1	●
FH302	TD6N-5066BM-4-27	4	66	27	60	50	22.0	12.4	7.0	51	20	2	●
FH303	TD6N-5066BM-5-27	5	66	27	60	50	22.0	12.4	7.0	51	20	2	●
FH304	TD6N-5080BM-6-27	6	80	27	60	63	22.0	12.4	7.0	65	20	2	●
FH305	TD6N-5100BM-7-32	7	100	32	78	63	25.5	14.4	8.0	85	26	2	●
FH306	TD6N-5125BM-6-40	6	125	40	89	63	38.0	16.4	9.0	110	60	2	○
FH307	TD6N-5125BM-8-40	8	125	40	89	63	38.0	16.4	9.0	110	60	2	○

NOTE: Double headed arbor screw W50-1031 for DCX52 (Body type 1) is included in body box.

High-feed CAM R 3

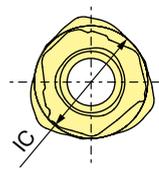


FC type
High-feed / general usage



FB type
High-feed / low cutting force

High-depth CAM R 4



HC type
High-depth

Item code	Tolerance class	CAM R	Grades			Size (mm)		Type
			JM4160	JS4030	JP4120	IC	T	
			ID codes			IC	T	
WOMU-140620-ER-FC	M	3	WF404	WF405	WF403	14	6.36	FC - High Feed
WOMU-140620-ER-FB			WF407	WF408	WF406*			FB - High Feed Low Force
WOMU-140630-ER-HC	M	4	WF410	WF411	WF409	14	6.21	HC - High Depth

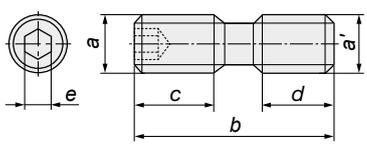
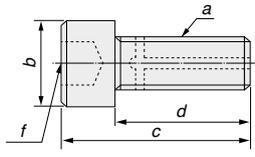
* Can be used to process the precipitation hardened stainless steel.

NOTE: Please note that the JS4030 coating does not cause a reaction in conductive touch sensors.

TD6N Radius mill TD6N type

Parts selection

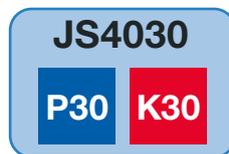
Parts	Clamp screw			Wrench	
Shape					
Cutter body	ID code	Item code	Fastening torque	ID code	Item code
DCX: 52-125 mm	ET162	555-141	4.9 Nm	ET014	105-T20

Parts	Arbor screw (double headed type and with airhole type)										
Shape	Type 1 					Type 2 					
Cutter body	ID code	Item code	Fastening torque	Type	a	a'	b	c	d	e	f
DCX: 52 mm	ET178	W50-1031	9.0 Nm	1	M10x1.0	M10x1.5	31	14	12	5	-
DCX: 66-80 mm	ET064	100-179	-	2	M12x1.75	-	18	42	30	-	10
DCX: 100 mm	ET181	100-180	-	2	M16x2.0	-	24	51	35	-	14
DCX: 125 mm	-	-	-	-	-	-	-	-	-	-	-

* Only needed when you using Arbor with centered cooling channel.

Insert grade classification and usage recommendation

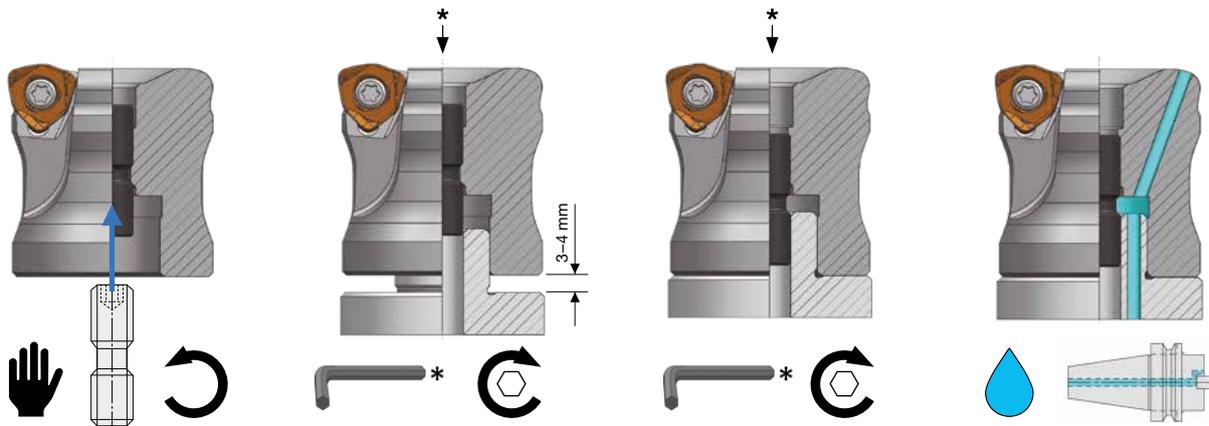
ISO 513 classification



Recommended insert grade by work material

	Work hardness			Work hardness		Work hardness		Work hardness	
	Low		High	Low	High	Low	High	Low	High
Unstable machining	JM4160					JM4160		JS4030	
Stable machining	JS4030			JP4120		JM4160		JP4120	
	Mild steel	Carbon steel, alloy steel	Carbon steel, alloy steel	Hardened steel (≤ 50 HRC)		Stainless steel materials SUS		Cast iron, FC, FCD	
	P			H		M		K	

| TD6N How to install DCX 52 body to arbor



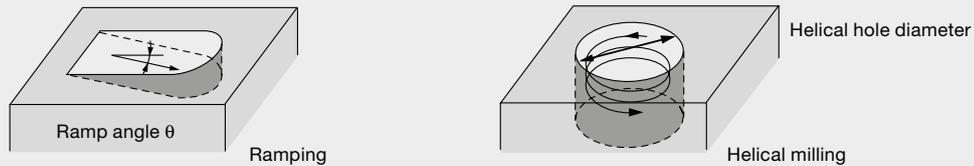
Tighten the arbor screw (W50-1031) **counterclockwise by hand** to the body until it stops.

Align the key groove and insert the body into the arbor, and while holding the body with hand, tighten the arbor screw **clockwise by hex-wrench**. (Clearance at start of tightening is about 3 to 4 mm)

Firmly tighten the arbor screw until it stops and make sure that the body is in **close contact** with arbor.

When using a center through, use an **arbor with coolant supply port** on the arbor side connection end.

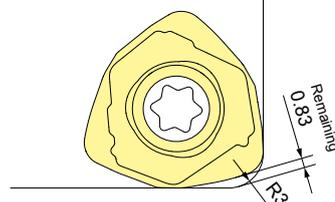
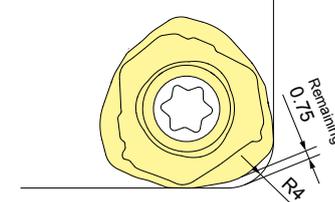
○ Regarding ramping and helical milling



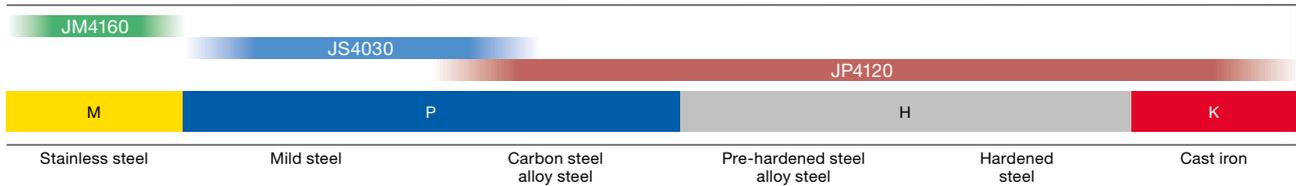
Process	Insert type		Parameter	DCX (mm)				
				52	66	80	100	125
Ramping	High-feed	WOMU-140620-ER-FC WOMU-140620-ER-FB	Max. ramp angle θ	2.4°	1.6°	1.2°	0.9°	0.7°
			Recommendation	1°			0.5°	
	High-depth	WOMU-140630-ER-HC	Max. ramp angle θ	2.0°	1.4°	1.1°	0.8°	0.6°
			Recommendation	1°		0.5°		0.4°
Helical milling	All types		Hole diameter (mm)	88-102	116-130	144-158	184-198	234-248
			Helical pitch (mm)	0.5 – 1.5				

○ About define the programming R on CAM

Please define the tool shape on the CAM with reference as below table

High feed inserts		High depth inserts	
WOMU-140620-ER-FC WOMU-140620-ER-FB		WOMU-140630-ER-HC	
CAM R	3.0	CAM R	4.0
Remains (mm)	0.83	Remains (mm)	0.75
High-feed type insert CAM R 3.0 		High-depth type insert CAM R 4.0 	

TD6N 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	



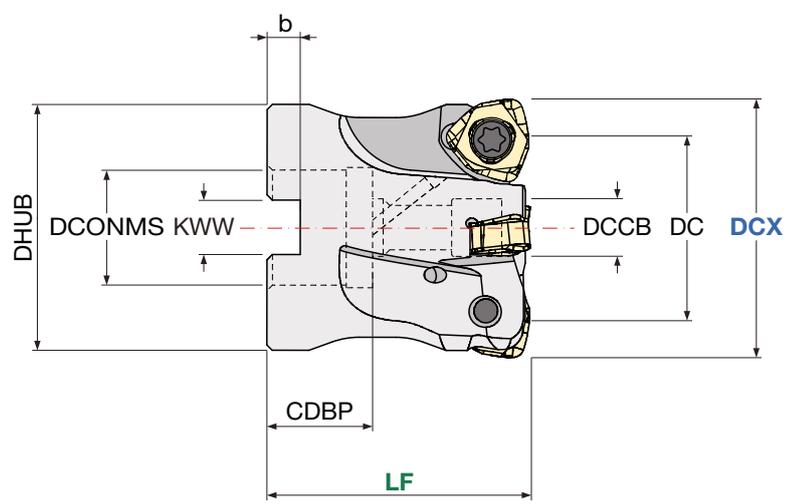
Rotations per minute (rpm)

$$n = \frac{V_c \cdot 1000}{\pi \cdot DCX}$$

Feed rate (mm/min)

$$V_f = n \cdot z \cdot f_z$$

Cutting parameters	
a_e	Radial depth of cut (mm)
a_p	Axial depth of cut (mm)
f_z	Feed per tooth (mm/t)
n	Revolutions per minute (min ⁻¹)
V_c	Cutting speed (m/min)
V_f	Feed rate (mm/min)
z	Number of teeth



Drawing nomenclature (mm)	
b	Depth of keyway
CDBP	Connection bore depth
DCCB	Counterbore diameter connection bore
DCONMS	Connection diameter machine side
DC	Diameter cutting (bottom)
DCX	Diameter cutting maximum
DHUB	Hub diameter
LF	Functional length
KWW	Keyway width



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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