

MillLine



DOOCTO

www.tungaloy.com

Tungaloy Report No. 385-G

Enhances efficiency in rough face milling operations - now available in **new CVD grades**



INDUSTRY 4.0
FEED the SPEED!

ngaloy

TAN07R080
MAX. RPM: 3000
(10x680)

ACCELERATED MACHINING

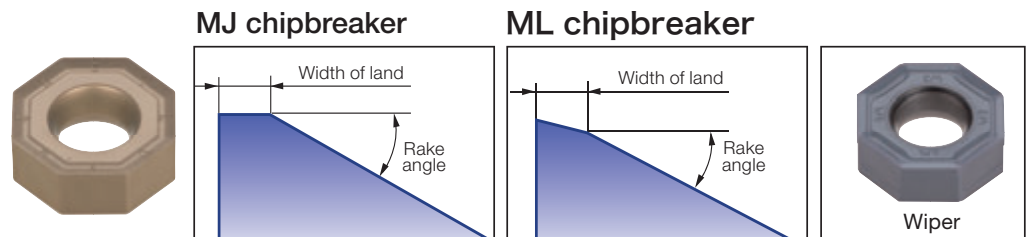


Economical face milling cutter with good depth of cut capability

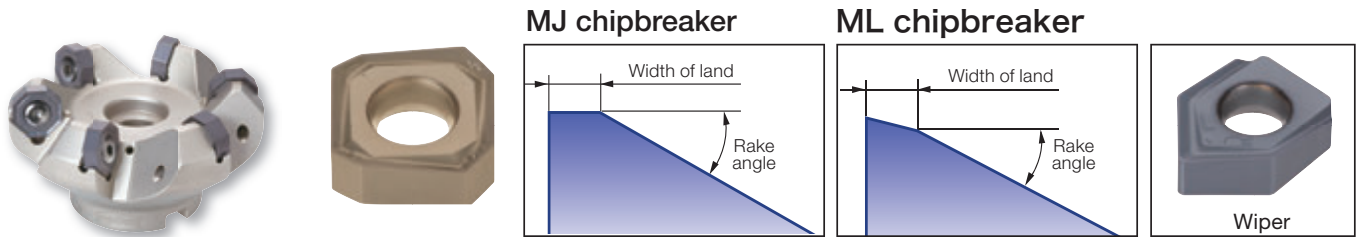
Enhanced geometries and grades for machining a wide range of materials, **especially for milling cast iron**

Inserts are available in single-sided or double-sided geometry, covering large cutting depths and high feed applications

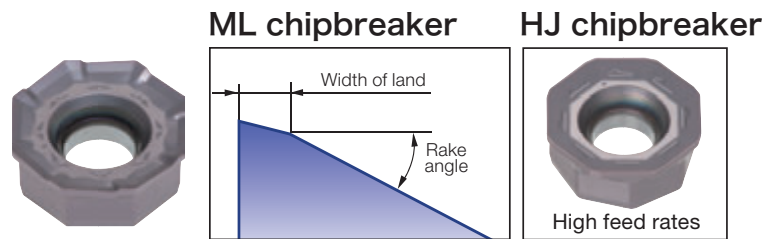
ONMU / ONHU Double-sided, octagonal inserts (economy)



SNMU / SNHU Double-sided, square inserts (large cutting depths)



OWMT Single-sided, octagonal insert (with low cutting load, high feed rates)



Enhanced cutter body lineup:

Including cutter diameters of $>\varnothing 315$ mm or extra close pitched design for effective cast iron milling



standard or close pitch (screw clamping)

For general purpose

Optimized orientation of coolant outlet which is located in a large chip gullet facilitates smooth chip evacuation. Large clamping screw enhances insert security. Cutter diameters: $\varnothing 80$ mm - $\varnothing 315$ mm



Extra close pitch (wedge clamping)

For efficient cast iron milling

Offers twice as much insert density as a screw clamping style cutter with easy indexability. Cutter diameters: $\varnothing 80$ mm - $\varnothing 160$ mm

OWMT inserts do not fit the cutter body with wedge clamping method.



Rich grade lineup for every kind of material

- A total of four grades, including two new CVD grades

AH3135



- PVD grade for high fracture resistance
- Most suitable for steel and stainless steel in general cutting parameters

AH120



- PVD grade with a well-balanced wear and fracture resistance
- Ideal for general machining of steel and stainless steel

T1215



- CVD grade with outstanding wear and chipping resistance
- Best for cast iron at high-speed machining

New

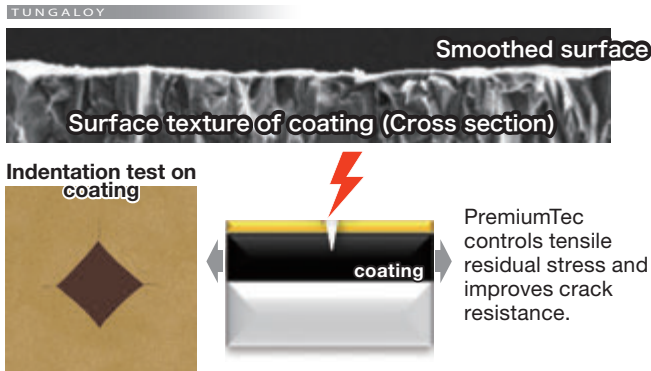
T3225



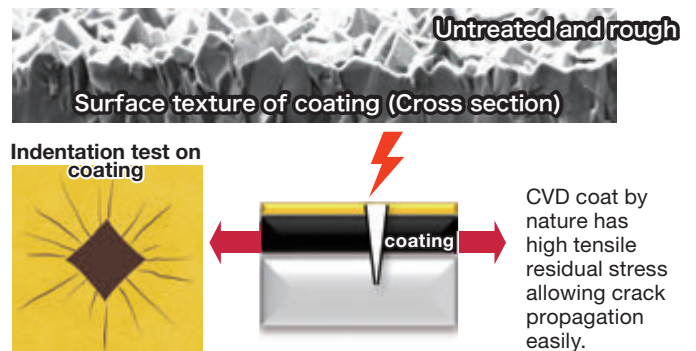
- CVD grade with excellent chipping and fracture resistance
- Most suited for steel and stainless steel at high-speed machining

Special Surface Technology

PREMIUMTEC

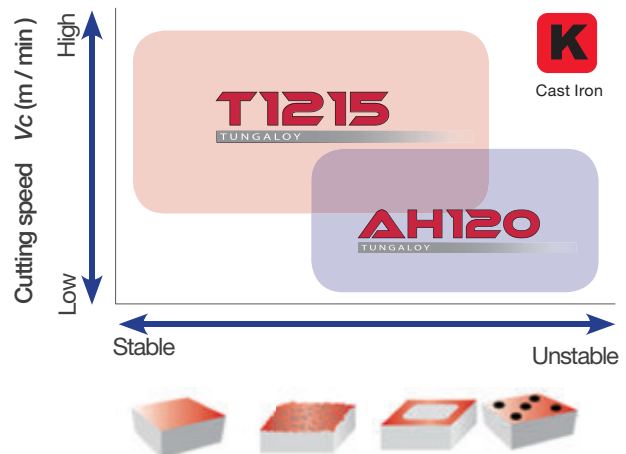
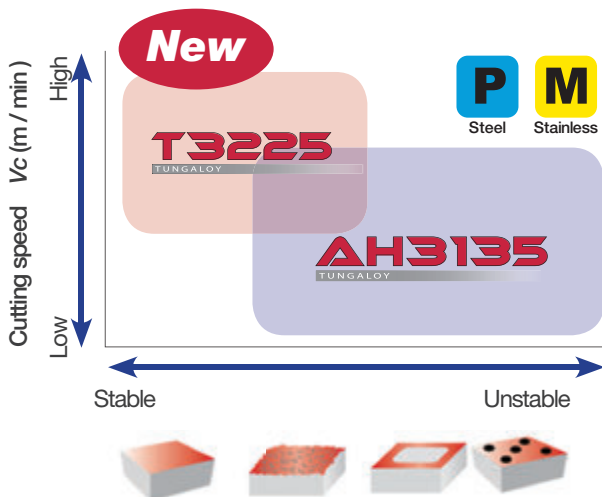


Conventional item



PremiumTec technology enhances both smoothness and toughness on coating surface, improving resistance to chipping, build-up edge, and fracture.

Application Area



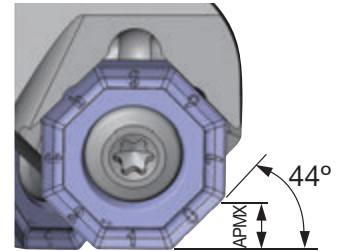
Features of ONMU and ONHU (double-sided, octagonal) inserts

Economical 16-edged insert

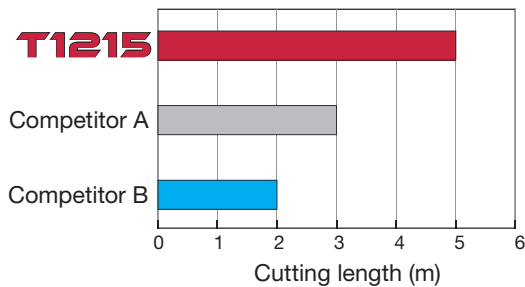
40% larger insert size (IC = 17.3 mm) to enhance insert strength



APMX = 4.75 mm

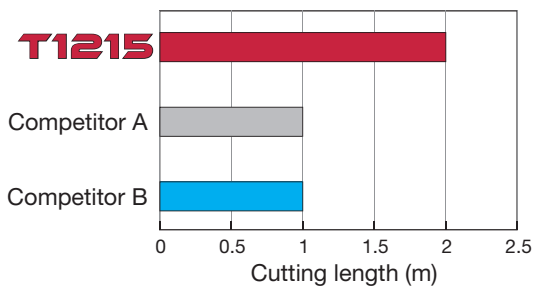


Tool life comparison in machining ductile cast iron (dry)



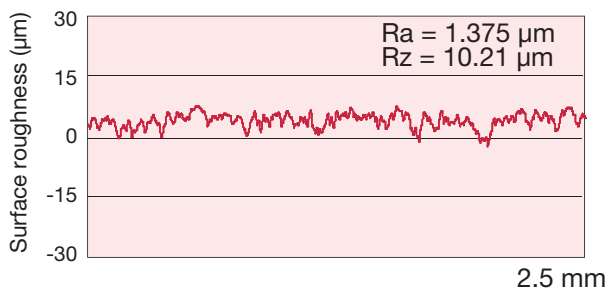
Cutter : TAN07R080M25.4-06 (ø80mm, Z = 1)
 Insert : ONMU0705ANPN-MJ T1215
 Workpiece material : FCD600 (160HB)
 Cutting speed : $V_c = 250$ m/min
 Feed per tooth : $f_z = 0.3$ mm/t
 Depth of cut : $a_p = 4$ mm
 Width of cut : $a_e = 60$ mm
 Coolant : Dry

Tool life comparison in machining ductile cast iron (wet)

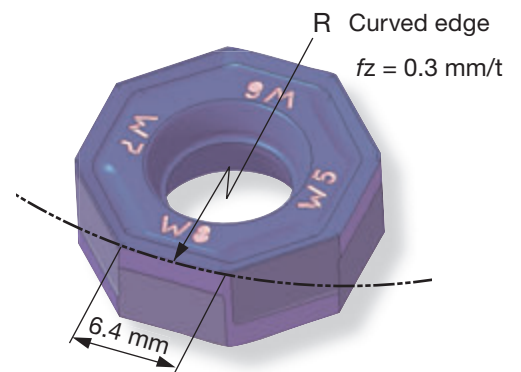


Cutter : TAN07R080M25.4-06 (ø80mm, Z = 1)
 Insert : ONMU0705ANPN-MJ T1215
 Workpiece material : FCD600 (160HB)
 Cutting speed : $V_c = 150$ m/min
 Feed per tooth : $f_z = 0.3$ mm/t
 Depth of cut : $a_p = 4$ mm
 Width of cut : $a_e = 60$ mm
 Coolant : Wet

Surface roughness (with wiper insert)



Cutter : TAN07R080M25.4-08 (ø80mm, Z = 8)
 Insert : ONHU0705ANTN-ML AH120 (7/8 pockets)
 ONHU0705ANPR-W AH120 (1/8 pocket)
 Workpiece material : FC250(180HB)
 Cutting speed : $V_c = 250$ m/min
 Feed per tooth : $f_z = 0.2$ mm/t
 Depth of cut : $a_p = 3$ mm
 Width of cut : $a_e = 60$ mm
 Coolant : Dry

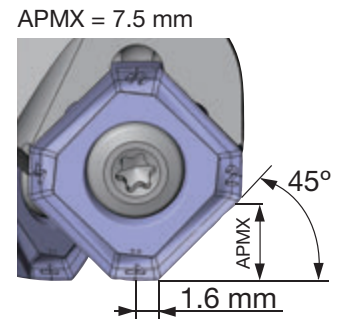


Features of SNMU and SNHU (double-sided, square) inserts

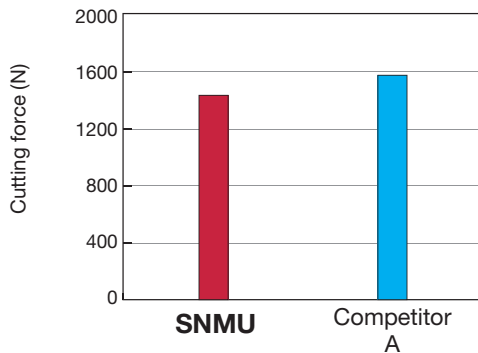
Allows large depths of cut up to 7.5 mm - ideal for removing scales

40% larger insert size (IC = 17.3 mm) to enhance insert strength

Large inclination angle on the cutting edge facilitates smooth chip evacuation

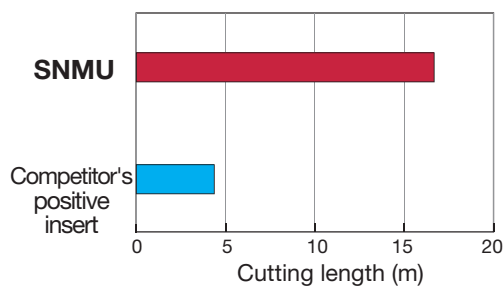


Cutting force



Cutter : TAN07R100M31.7-07 (ø100 mm, Z = 1)
 Insert : SNMU1706ANTR-ML AH3135
 Workpiece material : S55C (200HB)
 Cutting speed : $V_c = 150$ m/min
 Feed per tooth : $f_z = 0.2$ mm/t
 Depth of cut : $a_p = 3$ mm
 Width of cut : $a_e = 70$ mm
 Coolant : Dry

Tool life comparison in carbon steel



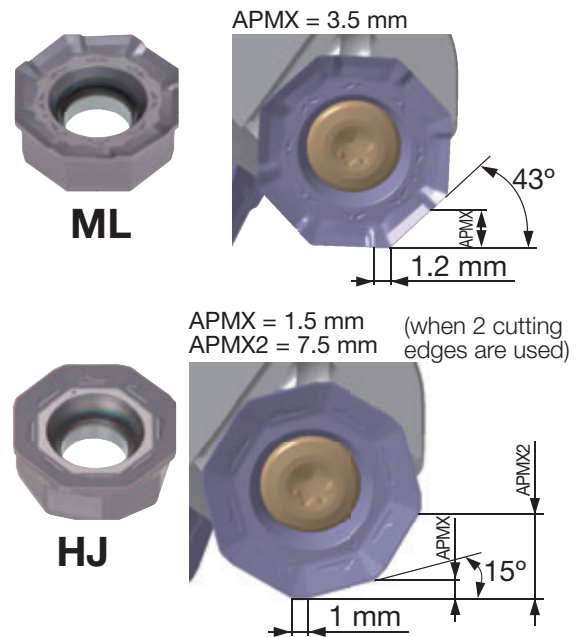
Cutter : TAN07R125M38.1-08 (ø125 mm, Z = 1)
 Insert : SNMU1706ANPR-MJ AH3135
 Workpiece material : S50C (200HB)
 Cutting speed : $V_c = 157$ m/min
 Feed per tooth : $f_z = 0.15$ mm/t
 Depth of cut : $a_p = 2$ mm
 Width of cut : $a_e = 120$ mm
 Coolant : Dry

Features of OWMT (single-sided, octagonal) inserts

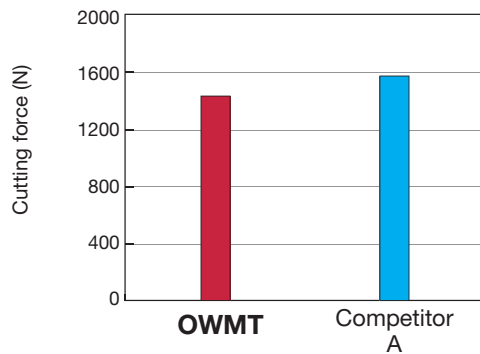
Offers ML style chipbreaker for up to 3.5 mm depth of cut and HJ style chipbreaker for high feed milling

Free cutting, positive geometry

Economical insert with 8 cutting edges

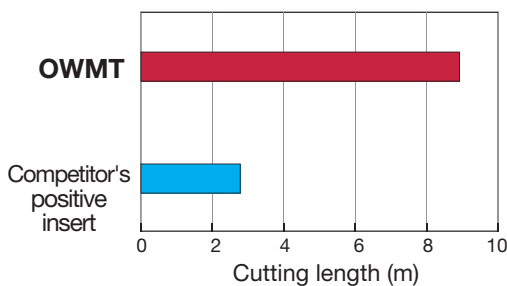


Cutting force



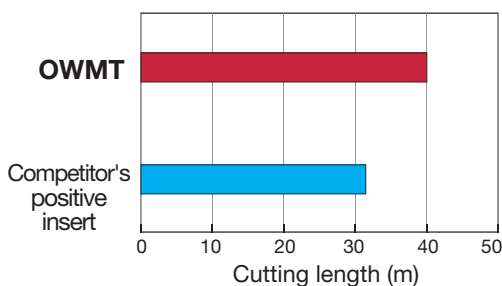
Cutter : TAN07R100M31.7-07 ($\phi 100$ mm, Z = 1)
 Insert : OWMT0807AAER-ML AH3135
 Workpiece material : S55C (200HB)
 Cutting speed : $V_c = 150$ m/min
 Feed per tooth : $f_z = 0.2$ mm/t
 Depth of cut : $a_p = 3$ mm
 Width of cut : $a_e = 70$ mm
 Coolant : Dry

Tool life comparison in stainless steel



Cutter : TAN07R100M31.7-07 ($\phi 100$ mm, Z = 1)
 Insert : OWMT0807AAER-ML AH3135
 Workpiece material : SUS304 (200HB)
 Cutting speed : $V_c = 150$ m/min
 Feed per tooth : $f_z = 0.2$ mm/t
 Depth of cut : $a_p = 2.5$ mm
 Width of cut : $a_e = 70$ mm
 Coolant : Dry

Tool life comparison in carbon steel

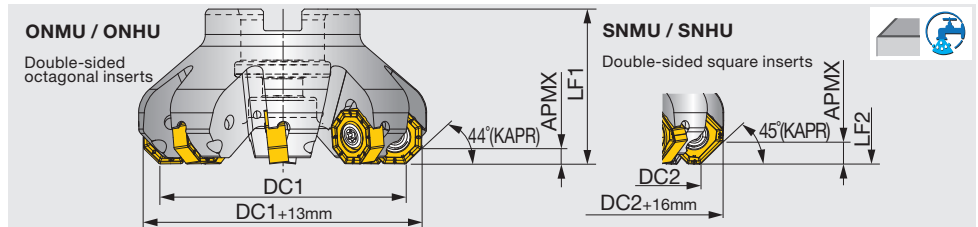


Cutter : TAN07R100M31.7-07 ($\phi D_c = 100$ mm, Z = 1)
 Insert : OWMT0807ZNER-HJ AH3135
 Workpiece material : S55C(200HB)
 Cutting speed : $V_c = 200$ m/min
 Feed per tooth : $f_z = 1$ mm/t
 Depth of cut : $a_p = 1$ mm
 Width of cut : $a_e = 60$ mm
 Coolant : Dry

TAN07

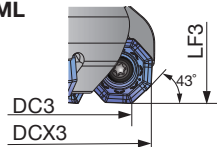
45° screw clamp type face mills with double sided octagonal or square inserts

A.R.=-6°,R.R.=+15.5°

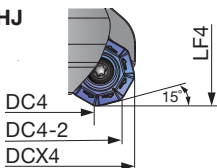


Designation	DC1	DC2	CICT	DCSFS	LF1	LF2	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert	Arbor type
TAN07R063M22.0E05	63	60.3	5	41	40	41.4	22	20	10.4	6.3	0.5	with	SN*U/ON*U/OWMT...	A
TAN07R063M22.0E06	63	60.3	6	41	40	41.4	22	20	10.4	6.3	0.5	with	SN*U/ON*U/OWMT...	A
TAN07R080M25.4-06	80	77.3	6	50	50	51.4	25.4	26	9.5	6	1	with	SN*U/ON*U/OWMT...	A
TAN07R080M25.4-08	80	77.3	8	50	50	51.4	25.4	26	9.5	6	1	with	SN*U/ON*U/OWMT...	A
TAN07R100M31.7-07	100	97.3	7	60	50	51.4	31.75	32	12.7	8	1.5	with	SN*U/ON*U/OWMT...	B
TAN07R100M31.7-10	100	97.3	10	60	50	51.4	31.75	32	12.7	8	1.5	with	SN*U/ON*U/OWMT...	B
TAN07R125M38.1-08	125	122.3	8	80	63	64.4	38.1	38	15.9	10	2.5	with	SN*U/ON*U/OWMT...	B
TAN07R125M38.1-12	125	122.3	12	80	63	64.4	38.1	38	15.9	10	2.5	with	SN*U/ON*U/OWMT...	B
TAN07R160M50.8-10	160	157.3	10	100	63	64.4	50.8	38	19	11	4	without	SN*U/ON*U/OWMT...	B
TAN07R160M50.8-15	160	157.3	15	100	63	64.4	50.8	38	19	11	4	without	SN*U/ON*U/OWMT...	B
TAN07R200M47.6-12	200	197.3	12	130	63	64.4	47.625	38	25.4	14	6.6	without	SN*U/ON*U/OWMT...	C
TAN07R200M47.6-18	200	197.3	18	130	63	64.4	47.625	38	25.4	14	6.7	without	SN*U/ON*U/OWMT...	C
TAN07R250M47.6-15	250	247.3	15	130	63	64.4	47.625	38	25.4	14	9.3	without	SN*U/ON*U/OWMT...	C
TAN07R250M47.6-21	250	247.3	21	130	63	64.4	47.625	38	25.4	14	9.4	without	SN*U/ON*U/OWMT...	C
TAN07R315M47.6-18	315	312.3	18	220	63	64.4	47.625	38	25.4	14	17.9	without	SN*U/ON*U/OWMT...	C
TAN07R315M47.6-24	315	312.3	24	220	63	64.4	47.625	38	25.4	14	18	without	SN*U/ON*U/OWMT...	C

OWMT-ML

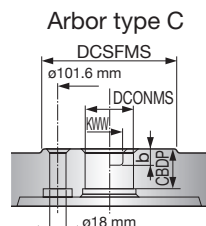
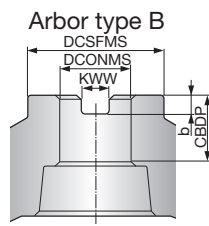
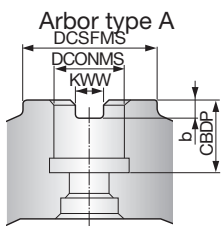


OWMT-HJ



Designation	OWMT-ML			OWMT-HJ			
	DC3	DCX3	LF3	DC4	DC4-2	DCX4	LF4
TAN07R063M...	63.5	76	41	55.7	67.2	76.4	41.4
TAN07R080M...	80.5	93	51	72.7	84.2	93.4	51.4
TAN07R100M...	100.5	113	51	92.7	104.2	113.4	51.4
TAN07R125M...	125.5	138	64	117.7	129.2	138.4	64.4
TAN07R160M...	160.5	173	64	152.7	164.2	173.4	64.4
TAN07R200M...	200.5	213	64	192.7	204.2	213.4	64.4
TAN07R250M...	250.5	263	64	242.7	252.2	263.4	64.4
TAN07R315M...	315.5	328	64	307.7	319.2	328.4	64.4

Note: OWMT08 inserts can be only used with screw on type cutters.

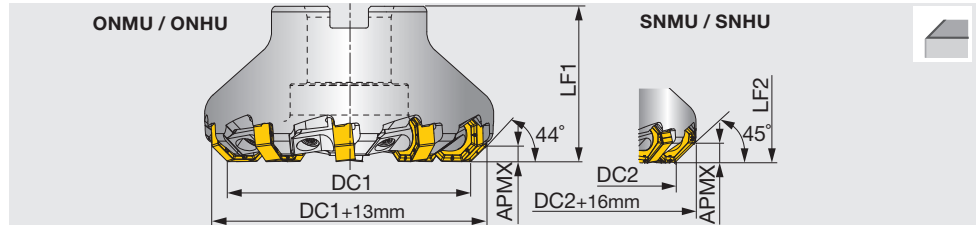


SPARE PARTS

Designation	Clamping screw	Grip	Shell locking bolt	Shell locking bolt 1	Torx bit
TAN07R063M22.0...	SRM5X0.8IP20X+ACROLYTE	H-TB	-	CM10X30H	BLDIP20/S7
TAN07R080M25.4...	SRM5X0.8IP20X+ACROLYTE	H-TB	-	CM12X30H	BLDIP20/S7
TAN07R100M31.7...	SRM5X0.8IP20X+ACROLYTE	H-TB	TMBA-M16H	-	BLDIP20/S7
TAN07R125M38.1...	SRM5X0.8IP20X+ACROLYTE	H-TB	TMBA-M20H	-	BLDIP20/S7
TAN07R160 - 315...	SRM5X0.8IP20X+ACROLYTE	H-TB	-	-	BLDIP20/M7

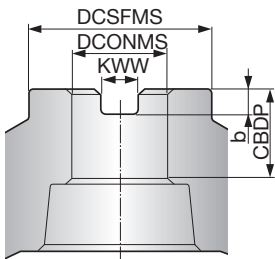
TAN07-W

45° wedge clamp type face mills with double sided octagonal or square inserts.



Designation	DC1	DC2	CICT	DCSFMS	LF1	LF2	DCONMS	CBDP	KWW	b	WT(kg)	Air hole	Insert	Arbor type
TAN07R063M22.0E08W	63	60.3	8	41	40	41.4	22	20	10.4	6.3	0.6	without	SN*U/ON*U/OWMT	B
TAN07R080M25.4-10W	80	77.3	10	50	50	51.4	25.4	26	9.5	6	1	without	SN*U/ON*U/OWMT	B
TAN07R100M31.7-14W	100	97.3	14	60	50	51.4	31.75	32	12.7	8	1.3	without	SN*U/ON*U/OWMT	B
TAN07R125M38.1-18W	125	122.3	18	80	63	64.4	38.1	38	15.9	10	2.8	without	SN*U/ON*U/OWMT	B
TAN07R160M50.8-22W	160	157.3	22	100	63	64.4	50.8	38	19	11	4	without	SN*U/ON*U/OWMT	B

Arbor type B

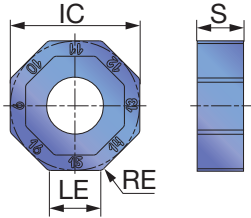


SPARE PARTS

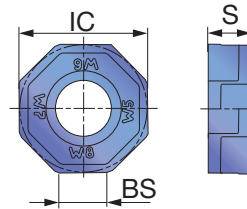
Designation	Grip	Locator	Clamping screw	Torx bit
TAN07-W	H-TBS	CLARM-10-TUNG1	DS-6P	BLDIP15/S7

INSERT

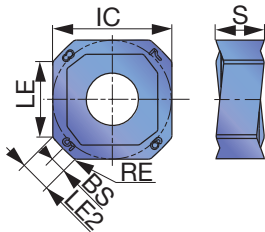
ONMU/ONHU0705-MJ / -ML



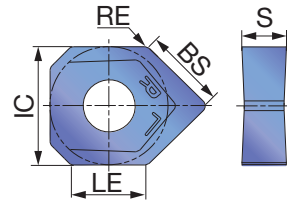
ONHU0705-W



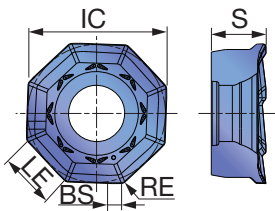
SNMU/SNHU1706 -MJ / -ML



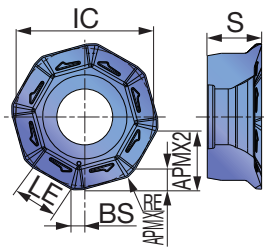
SNHU1706-W



OWMT0807-ML



OWMT0807-HJ



P Steel	☆			★	★			★
M Stainless		★	☆	☆	★			★
K Cast iron	★			☆		★	★	
N Non-ferrous								
S Superalloys	★	☆		★	☆			
H Hard materials								

★ : First choice
☆ : Second choice

Designation	RE	APMX	Coated New							LE	S	LE2	IC	BS	APMX2		
			AH120	AH130	AH140	AH725	AH3135	T1115	T1215							T3225	
ONMU0705ANPN-MJ	0.8	4.75			●	●	●	●	●	●	●	7.2	6.2	-	17.3	-	-
ONMU0705ANPN-ML	0.8	4.75	●				●					7.2	6.2	-	17.3	-	-
ONHU0705ANPN-MJ	0.8	4.75			●	●						7.2	6.2	-	17.3	-	-
ONHU0705ANTN-ML	0.8	4.75	●		●	●						7.2	6.2	-	17.3	-	-
ONHU0705ANPR-W *	-	4.75	●									7.2	5.8	-	17.5	6.4	-
SNMU1706ANPR-MJ	0.8	7.5			●	●	●		●	●		11	6.98	4.4	17.3	1.8	-
SNMU1706ANTR-ML	0.8	7.5	●				●					11	6.98	4.4	17.3	1.8	-
SNHU1706ANPR-MJ	0.8	7.5			●	●						11	6.98	4.4	17.3	1.8	-
SNHU1706ANTR-ML	0.8	7.5	●				●					11	6.98	4.4	17.3	1.8	-
SNHU1706ANFN-W *	0.4	7.5	●									11	6.5	-	17.3	11	-
OWMT0807AAER-ML	0.8	3.5		●				●				5.2	7.4	-	-	1.2	-
OWMT0807ZNER-HJ	1.2	1.5						●				-	7.4	-	19	1	7.5

* Pay attention to the wiper insert installation procedure : page12.

● : new product
● : Line up

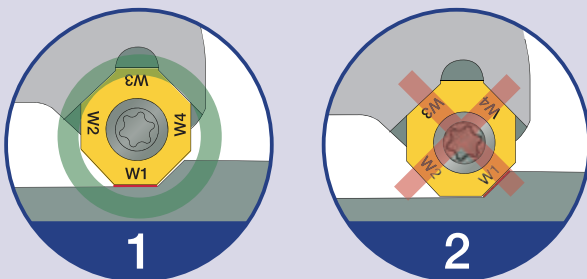
STANDARD CUTTING CONDITIONS

NEGATIVE TYPE (ONMU / ONHU / SNMU / SNHU)

ISO	Workpiece material	Hardness	Priority	Recommendation		Cutting speed Vc (m/min)	Feed per tooth fz (mm/t)
				Grade	Chipbreaker		
P	Low carbon steel C15E, etc.	- 200 HB	First choice	AH3135	MJ	100 - 250	0.2 - 0.5
		- 200 HB	For wear resistance	T3225	MJ	200 - 350	0.2 - 0.4
		- 200 HB	For fracture resistance	AH3135	ML	100 - 250	0.2 - 0.4
	High carbon steel C45E, C55E, etc.	200 - 300 HB	First choice	AH3135	MJ	100 - 230	0.2 - 0.4
		200 - 300 HB	For wear resistance	T3225	MJ	180 - 300	0.2 - 0.4
		200 - 300 HB	For fracture resistance	AH3135	ML	100 - 230	0.2 - 0.4
	Alloy steel 42CrMo4, 17Cr3, etc.	150 - 330 HB	First choice	AH3135	MJ	100 - 200	0.2 - 0.4
		150 - 330 HB	For wear resistance	T3225	MJ	150 - 250	0.2 - 0.4
		150 - 330 HB	For fracture resistance	AH3135	ML	100 - 200	0.2 - 0.4
M	Stainless steel X5CrNi18-9, etc.	- 200 HB	First choice	AH3135	MJ	100 - 200	0.1 - 0.3
		- 200 HB	For wear resistance	T3225	MJ	100 - 250	0.1 - 0.3
K	Grey cast iron 250, 300, etc.	150 - 250 HB	First choice	T1215	MJ	150 - 300	0.1 - 0.5
		150 - 250 HB	For fracture resistance	AH725	MJ	100 - 250	0.1 - 0.5
		150 - 250 HB	For wear resistance	AH120	ML	100 - 250	0.1 - 0.5
	Ductile cast iron 600-3, etc.	150 - 300HB	First choice	T1215	MJ	100 - 300	0.1 - 0.5
		150 - 300 HB	For fracture resistance	AH725	MJ	80 - 200	0.1 - 0.5
		150 - 300 HB	For wear resistance	AH120	ML	80 - 200	0.1 - 0.5
H	Hardened steel	HRC 40 - 50	First choice	AH725	MJ	80 - 130	0.1 - 0.2
		HRC 50 - 60	First choice	AH725	MJ	50 - 70	0.05 - 0.1

Attention for wiper inserts

ONHU0705ANPR-W

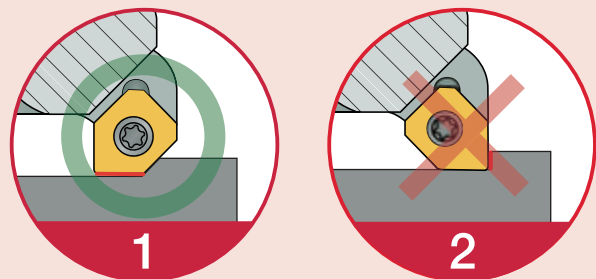


Attach only one wiper insert on the cutter and make sure the wiper edge faces the machining surface.

Feed rate: $f < 5.5$ mm/rev

Do not use this insert mixed with SNMU, SNHU, or OWMT inserts on the same cutter.

SNHU1706ANFN-W



Attach only one wiper insert on the cutter and make sure the wiper edge faces the machining surface.

Feed rate: $f < 9.5$ mm/rev

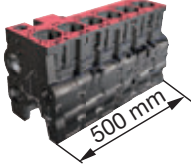
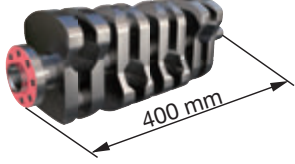
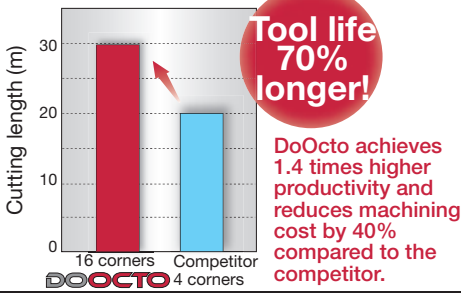

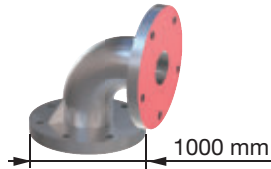
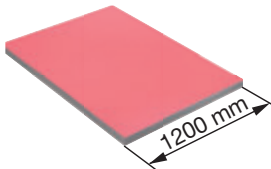
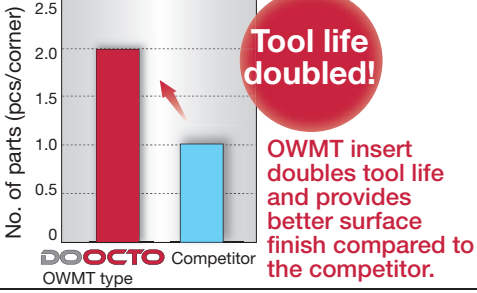
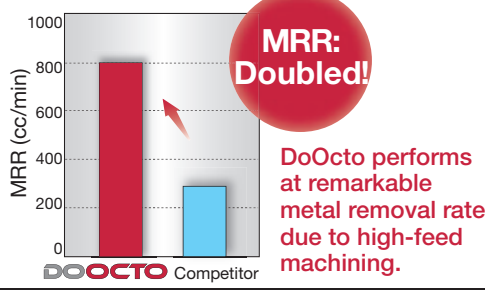
Do not use this insert mixed with ONMU, ONHU, or OWMT inserts on the same cutter.

STANDARD CUTTING CONDITIONS

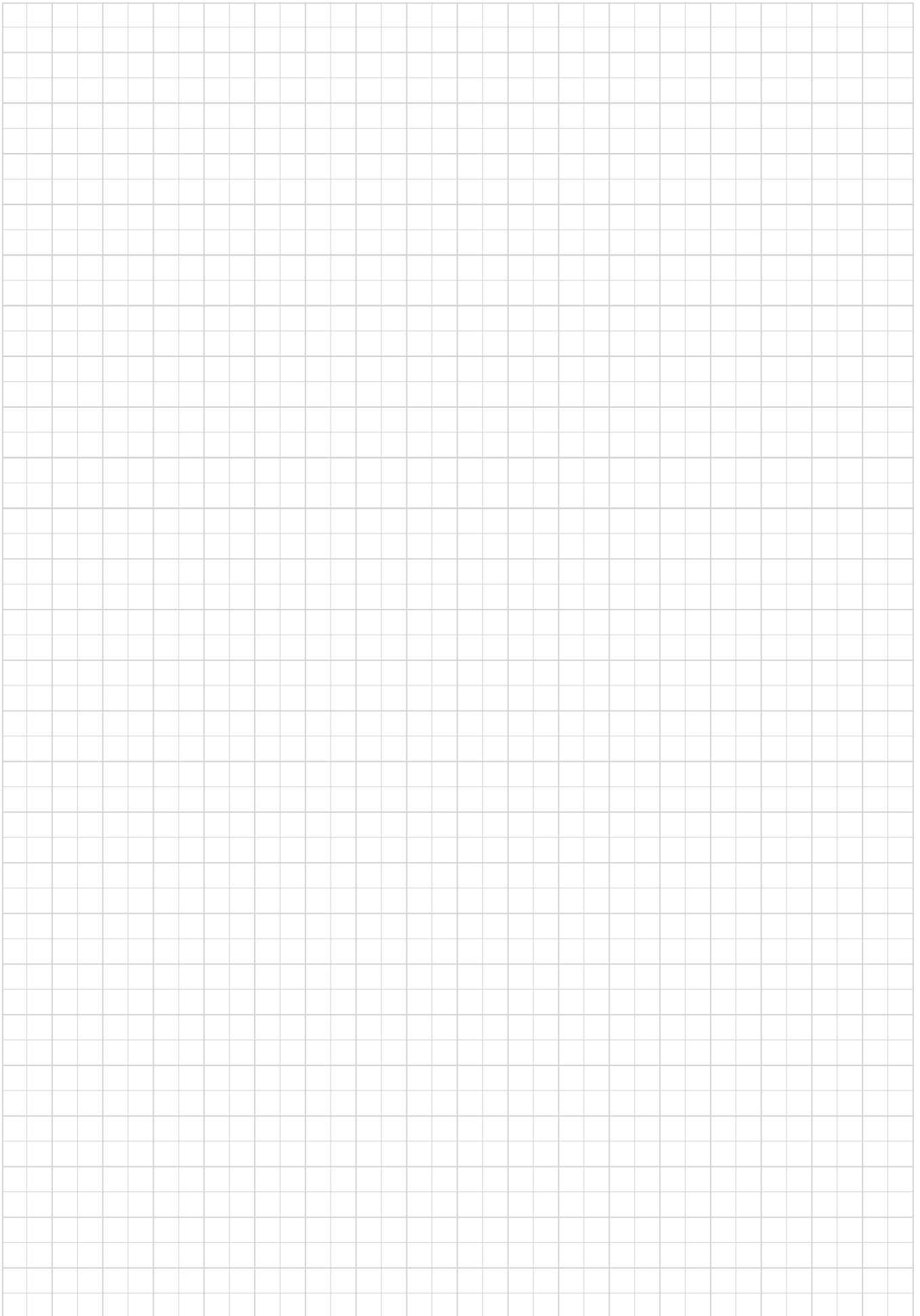
POSITIVE TYPE (OWMT)

ISO	Workpiece material	Hardness	Priority	Grade	Cutting speed Vc (m/min)	Feed per tooth : fz (mm/t)	
						ML	HJ*
P	Low carbon steel C15E, etc.	- 200 HB	First choice	AH3135	100 - 300	0.1 - 0.4	0.5 - 1.5
		- 200 HB	For fracture resistance	AH130	100 - 300	0.1 - 0.4	-
	High carbon steel C45E, C55E, etc.	200 - 300 HB	First choice	AH3135	100 - 230	0.1 - 0.3	0.5 - 1.5
		200 - 300 HB	For fracture resistance	AH130	100 - 230	0.1 - 0.3	-
M	Alloy steel 42CrMo4, 17Cr3, etc.	150 - 330 HB	First choice	AH3135	100 - 200	0.1 - 0.3	0.5 - 1.5
		150 - 330 HB	For fracture resistance	AH130	100 - 200	0.1 - 0.3	-
M	Stainless steel X5CrNi18-9, etc.	- 200 HB	First choice	AH3135	100 - 150	0.1 - 0.3	0.3 - 0.7
		- 200 HB	For fracture resistance	AH130	100 - 150	0.1 - 0.3	-
K	Grey cast iron 250, 300, etc.	150 - 250 HB	First choice	AH3135	100 - 250	0.1 - 0.4	0.5 - 1.5
		150 - 250 HB	For fracture resistance	AH130	100 - 250	0.1 - 0.4	-
	Ductile cast iron 600-3, etc.	150 - 250 HB	First choice	AH3135	80 - 200	0.1 - 0.3	0.5 - 1.5
		150 - 250 HB	For fracture resistance	AH130	80 - 200	0.1 - 0.3	-
S	Titanium alloy Ti-6Al-4V, etc.	- HRC 40	First choice	AH3135	30 - 60	0.1 - 0.3	0.3 - 0.7
		- HRC 40	For fracture resistance	AH130	30 - 60	0.1 - 0.3	-
	Heat resistant alloy Inconel718, etc.	- HRC 40	First choice	AH3135	10 - 40	0.05 - 0.15	0.1 - 0.3
		- HRC 40	For fracture resistance	AH130	10 - 40	0.05 - 0.15	-
H	Hardened steel	HRC 40 - 50	First choice	AH3135	80 - 130	-	0.1 - 0.3
		HRC 50 - 60	First choice	AH3135	50 - 70	-	0.03 - 0.07

PRACTICAL EXAMPLES

Workpiece type		Cylinder block	Crank shaft
Cutter		TAN07R160M50.8-15 (ø160 mm, z = 15)	TAN07R100M31.7-07 (ø100 mm, z = 7)
Insert		ONHU0705ANTN-ML	ONMU0705ANPN-ML
Grade		AH120	AH3135
Workpiece material		FC250  K	SCM435 / 34CrMo4  P
Cutting conditions	Cutting speed: Vc (m/min)	180	80
	Feed per tooth: fz (mm/t)	0.18 → 0.2	0.18
	Feed speed: Vf (mm/min)	780 → 1080	320
	Depth of cut: ap (mm)	3	3
	Cutting width: ae (mm)	100	75
	Method of machining	Face milling	Face milling
	Coolant	Dry	Wet
Machine		Vertical M/C, BT50	Specialized machine
Results		 <p>Tool life 70% longer!</p> <p>DoOcto achieves 1.4 times higher productivity and reduces machining cost by 40% compared to the competitor.</p>	 <p>Tool life 80% longer!</p> <p>Tool life of AH3135 is 1.8 times longer than the competitor.</p>
Workpiece type		Elbow	Mold base
Cutter		TAN07R200M47.6-12 (ø200 mm, z = 12)	TAN07R125M40.0E08 (ø125 mm, z = 8)
Insert		OWMT0807AAER-ML	OWMT0807ZNER-HJ
Grade		AH3135	AH3135
Workpiece material		SCS10 / 25Cr5NiMoN  M	SS400  P
Cutting conditions	Cutting speed: Vc (m/min)	70	200
	Feed per tooth: fz (mm/t)	0.2	1.5
	Feed speed: Vf (mm/min)	267	6100
	Depth of cut: ap (mm)	1	1
	Cutting width: ae (mm)	180	110
	Method of machining	Face milling	Face milling
	Coolant	Wet	Dry
Machine		Horizontal M/C, BT50	Vertical M/C, BT50
Results		 <p>Tool life doubled!</p> <p>OWMT insert doubles tool life and provides better surface finish compared to the competitor.</p>	 <p>MRR: Doubled!</p> <p>DoOcto performs at remarkable metal removal rate due to high-feed machining.</p>

MEMO

A large grid of graph paper, consisting of 20 columns and 30 rows of small squares, intended for writing a memo. The grid is empty and occupies most of the page.

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