MillLine

DOPENT

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Tungaloy Report No. 372S1-US

New grades and cutters for improved productivity machining large components of various materials

INDUSTRY 4.0

FEED the SPEED!

DOPENT
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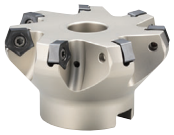
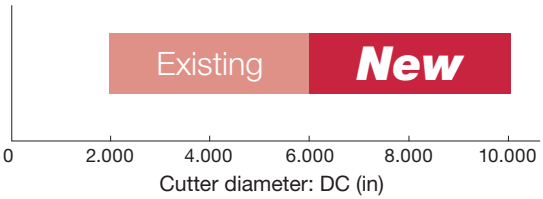
For more information

Addition of cutters with large diameters improves machining efficiency of large components

DoPent's new cutters with 8.000" and 10.000" diameters are also available in variable-pitch design for reduced chatter and vibration during machining.

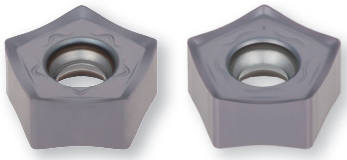


Bore type

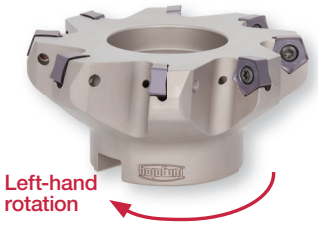


A combination of new grades and neutral cutting edges boosts productivity in a wider application range

- For steel: **AH3225** PVD grade offers a good combination of wear and fracture resistance. **NS740** cermet grade is an excellent option for finishing steel.
- For hardened materials: **AH8015** PVD grade exhibits a good balance between wear and fracture resistance.



Since neutral inserts can be mounted on either the left- or right-hand cutter, DoPent is an ideal solution for duplex milling applications where the workpiece is machined with two spindles simultaneously.

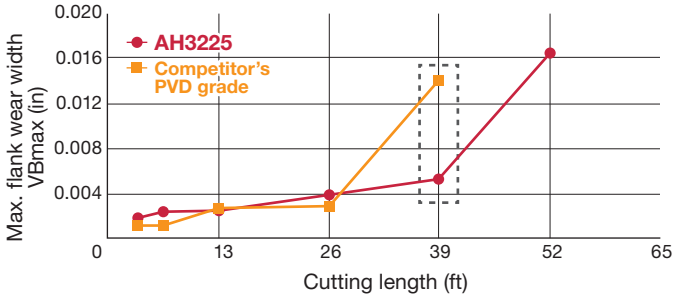


Left-hand cutter

CUTTING PERFORMANCE

AH3225 P

- Excellent resistance to wear, fracture and oxidation
- First choice grade for steel machining with the latest nano-multilayer coating technology, combined with a dedicated carbide substrate



Cutter	: TEN09R250U0075A04 (ø2.500", z = 4)
Insert	: PNMU0905GNEN-MJ AH3225
Workpiece material	: 1055 (200HB)
Cutting speed	: *Vc* = 660 sfm
Feed per tooth	: *fz* = 0.008 ipr
Depth of cut	: *ap* = 0.080"
Depth of width	: *ae* = 1.970"
Coolant	: Dry

After 39 ft

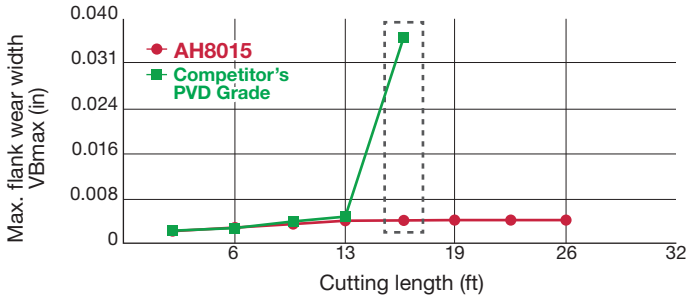
Competitor's PVD grade

Reduced crater wear

AH3225

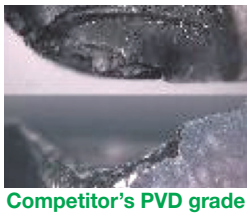
AH8015 H K

- Extremely hard coating and carbide substrate
- First choice grade for hardened materials with superior resistance to wear, thermal shock and welding



Cutter	: TEN09R250U0075A04 (ø2.500", z = 4)
Insert	: PNMU0905GNEN-MJ AH8015
Workpiece material	: H-13 (52HRC)
Cutting speed	: *Vc* = 330 sfm
Feed per tooth	: *fz* = 0.004 ipr
Depth of cut	: *ap* = 0.020"
Depth of width	: *ae* = 1.180"
Coolant	: Dry

After 16 ft



Competitor's PVD grade

... and still could have continued

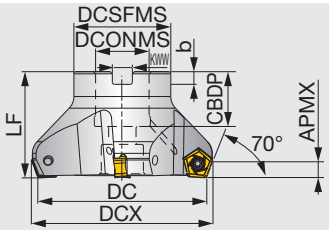
AH8015

TEN09R/L

70° face mill, with screw clamp system, for double sided pentagonal inserts

GAMP=-6°,GAMF=-10°~-2°

Arbor type A



Right hand (R) shown.

Inch	APMX	DC	CICT	DCX	DCSFMS	LF	DCONMS	CBDP	KWW	b	WT(lb)	Air hole	Insert	Arbor type
TEN09R200U0075A03	0.250	2.000	3	2.240	1.690	1.570	0.750	0.750	0.310	0.200	0.9	With	PN*U0905...	A
TEN09R200U0075A04	0.250	2.000	4	2.240	1.690	1.570	0.750	0.750	0.310	0.200	0.9	With	PN*U0905...	A
TEN09R200U0075A06	0.250	2.000	6	2.240	1.690	1.570	0.750	0.750	0.310	0.200	0.9	With	PN*U0905...	A
TEN09R250U0075A04	0.250	2.500	4	2.740	1.690	1.570	0.750	0.750	0.310	0.200	1.3	With	PN*U0905...	A
TEN09R250U0075A06	0.250	2.500	6	2.740	1.690	1.570	0.750	0.750	0.310	0.200	1.3	With	PN*U0905...	A
TEN09R250U0075A08	0.250	2.500	8	2.740	1.690	1.570	0.750	0.750	0.310	0.200	1.3	With	PN*U0905...	A
TEN09R300U0100A04	0.250	3.000	4	3.240	1.970	1.970	1.000	1.020	0.370	0.240	2.0	With	PN*U0905...	A
TEN09R300U0100A07	0.250	3.000	7	3.240	1.970	1.970	1.000	1.020	0.370	0.240	2.0	With	PN*U0905...	A
TEN09R300U0100A10	0.250	3.000	10	3.240	1.969	1.970	1.000	1.020	0.370	0.240	2.2	With	PN*U0905...	A
TEN09R400U0150A05	0.250	4.000	5	4.240	3.150	1.970	1.500	1.380	0.630	0.390	3.5	With	PN*U0905...	B
TEN09R400U0150A08	0.250	4.000	8	4.240	3.150	1.970	1.500	1.380	0.630	0.390	3.7	With	PN*U0905...	B
TEN09R400U0150A12	0.250	4.000	12	4.240	3.150	1.970	1.500	1.380	0.630	0.390	4.0	With	PN*U0905...	B
TEN09R500U0150A06	0.250	5.000	6	5.240	3.150	2.480	1.500	1.460	0.630	0.390	6.0	With	PN*U0905...	B
TEN09R500U0150A10	0.250	5.000	10	5.240	3.150	2.480	1.500	1.460	0.630	0.390	6.4	With	PN*U0905...	B
TEN09R500U0150A16	0.250	5.000	16	5.240	3.150	2.480	1.500	1.460	0.630	0.390	6.8	With	PN*U0905...	B
TEN09R600U0200A07	0.250	6.000	7	6.240	3.940	2.480	2.000	1.500	0.750	0.430	8.6	Without	PN*U0905...	B
TEN09R600U0200A12	0.250	6.000	12	6.240	3.940	2.480	2.000	1.500	0.750	0.430	9.3	Without	PN*U0905...	B
TEN09R600U0200A20	0.250	6.000	20	6.240	3.940	2.480	2.000	1.500	0.750	0.430	10.0	Without	PN*U0905...	B
New TEN09R800U0250A14	0.252	8.000	14	8.230	5.120	2.480	2.500	1.500	1.000	0.550	14.0	Without	PN*U0905...	B
New TEN09R1000U0250A16	0.252	10.000	16	10.230	5.120	2.480	2.500	1.500	1.000	0.550	30.4	Without	PN*U0905...	B

SPARE PARTS



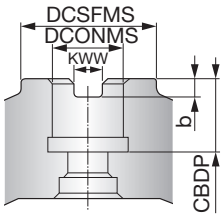


Designation	Clamping screw	Grip	Lubricant	Shell locking bolt (Optional parts)	Torx bit
TEN09R200..., 250...	CSTR-4L100	H-TBS	M-1000	(C0.375X1.125H)	BT15S
TEN09R300...	CSTR-4L100	H-TBS	M-1000	(C0.500X1.375H)	BT15S
TEN09R400..., 500...	CSTR-4L100	H-TBS	M-1000	(TMBA-0.750H)	BT15S
TEN09R600, 800, 1000...	CSTR-4L100	H-TBS	M-1000	-	BT15M

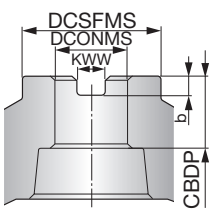
*Recommended clamping torque：CSTR-4L100 = 2.58 lbs·ft

Arbor type

Arbor type A

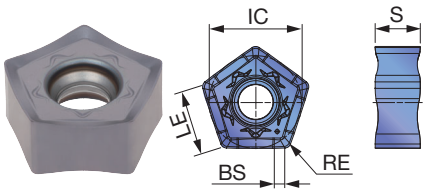


Arbor type B

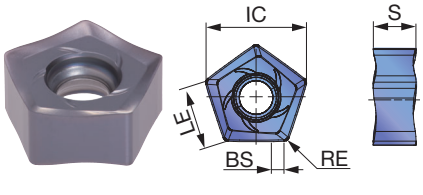


INSERTS

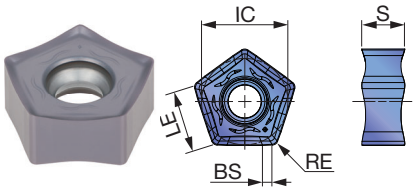
PN*U0905GNEN-MJ (Neutral)



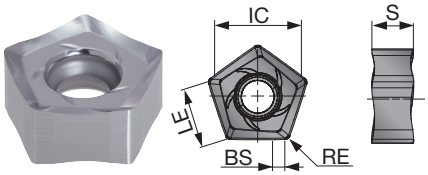
PNCU0905GNER-MJ (Right hand)



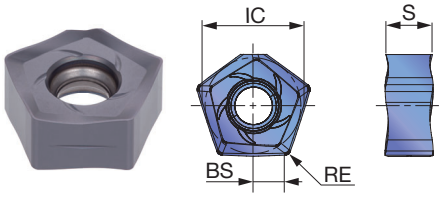
PNCU0905-ML (Neutral)



PNCU0905-AJ (Right hand)



PNCU0905-W (Right hand)



		AH3225	AH8015	AH3135	AH120	AH140	AH725	T1215	T1115	T3225	T3130	NS740	TH10
P	Steel	★	☆	★	☆		★			☆	☆	★	
M	Stainless			★		☆	☆			☆			
K	Cast iron		☆		★		☆	★	★				
N	Non-ferrous												★
S	Superalloys			☆	☆		★						
H	Hard materials		★										

★ : First choice
☆ : Second choice

Designation	RE	APMX	New	New	Coated								Cermet	Uncoated	LE	S	IC	BS
			AH3225	AH8015	AH3135	AH120	AH140	AH725	T1215	T1115	T3225	T3130	NS740	TH10				
PNMU0905GNEN-MJ	0.031	0.252	●	●	●	●			●		●		●		0.350	0.236	0.480	0.055
PNCU0905GNEN-MJ	0.031	0.252	●	●	●	●			●		●		●		0.350	0.236	0.480	0.055
PNCU0905GNER-MJ	0.031	0.252				●	●	●		●		●	●		0.350	0.233	0.480	0.055
PNCU0905GNEN-ML	0.031	0.252	●	●	●										0.350	0.235	0.480	0.055
PNCU0905GNFR-AJ	0.031	0.252												●	0.350	0.246	0.480	0.055
PNCU0905GNER-W	0.031	0.079						●							-	0.233	0.480	0.150

●: New

STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Hardness HB	Selection criteria	Recommended grade	Chip-breaker	Cutting speed *Vc* (sfm)	Feed per tooth *fz* (ipt)
P	Low carbon steels 1015, etc.	200 - 300 HB	First choice	AH3225	MJ	330 - 820	0.004 - 0.016
		200 - 300 HB	Low cutting force	AH3225	ML	330 - 820	0.004 - 0.012
		200 - 300 HB	Wear resistance	T3225	MJ	660 - 1150	0.004 - 0.012
		200 - 300 HB	Surface quality	NS740	MJ	330 - 820	0.004 - 0.012
	High carbon steels, alloyed steels 1045, etc.	150 - 300 HB	First choice	AH3225	MJ	330 - 820	0.004 - 0.014
		150 - 300 HB	Low cutting force	AH3225	ML	330 - 820	0.004 - 0.012
		150 - 300 HB	Wear resistance	T3225	MJ	59 - 990	0.004 - 0.012
		150 - 300 HB	Surface quality	NS740	MJ	330 - 820	0.004 - 0.012
	Prehardened steels NAK80, PX5, etc.	30 - 40 HRC	First choice	AH3225	MJ	330 - 660	0.004 - 0.012
		30 - 40 HRC	Low cutting force	AH3225	ML	330 - 660	0.004 - 0.010
		30 - 40 HRC	Wear resistance	T3225	MJ	490 - 820	0.004 - 0.010
M	Stainless steel S30400, etc.	- 200 HB	First choice	AH3135	ML	330 - 660	0.004 - 0.012
		- 200 HB	Fracture resistance	AH3135	MJ	330 - 660	0.004 - 0.014
		- 200 HB	Wear resistance	T3225	MJ	330 - 820	0.004 - 0.012
K	Gray cast irons No.250B, No.300B, etc.	150 - 250 HB	First choice	T1215	MJ	330 - 980	0.004 - 0.014
		150 - 250 HB	Fracture resistance	AH120	MJ	330 - 820	0.004 - 0.016
	Ductile cast iron 60-40-18, etc.	150 - 250 HB	First choice	T1215	MJ	330 - 980	0.004 - 0.014
		150 - 250 HB	Fracture resistance	AH120	MJ	260 - 660	0.004 - 0.016
N	Aluminum alloys Si < 13%	-	First choice	TH10	AJ	1640 - 4920	0.004 - 0.020
	Aluminum alloys Si ≥ 13%	-	First choice	TH10	AJ	490 - 1640	0.004 - 0.020
S	Titanium alloys Ti-6Al-4V, etc.	- 40 HRC	First choice	AH3135	ML	98 - 197	0.004 - 0.012
		- 40 HRC	Fracture resistance	AH3135	MJ	98 - 197	0.004 - 0.012
	Heat-resistant alloys Inconel 718, etc.	- 40 HRC	First choice	AH725	MJ	33 - 131	0.0004 - 0.004
H	Hardened materials H-13, etc.	- 45 HRC	First choice	AH8015	MJ	260 - 490	0.002 - 0.006
		- 45 HRC	Low cutting force	AH8015	ML	260 - 490	0.002 - 0.006

· Remove excessive chips with an air blast to prevent chip jamming.
· Use water-soluble coolant to avoid built-up edge in case extreme welding occurs on cutting edges. (ex. aluminum machining).
· For operations with a varied depth of cut (ex. casting skin) and machining of workpiece materials with interrupted surface, the feed (*fz*) should be set to the lower recommended value shown in the above table.
· Cutting conditions may be limited depending on machine power, workpiece rigidity and spindle output. When the cutting width, depth or overhang length is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.

MEMO

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