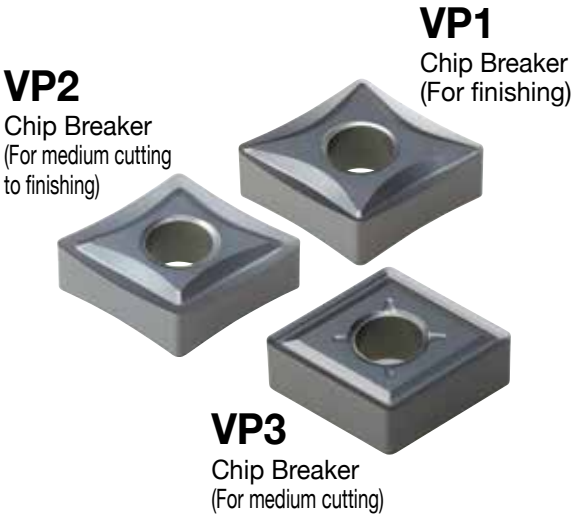
KORLOY
TECH-NEWS

PC8105 / PC8110 / PC8115

Insert Series for Turning Application of Hard-to-cut Materials



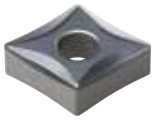
A Solution for Machining Hard-to-cut Materials

- **PC8100 Series**
  Exclusive grades for turning application of heat resistant alloy and stainless steel
- **H01 / H05**
  Exclusive grades for machining titanium alloy
- **VP Series Chip Breaker**
  Higher productivity and stable machining due to excellent chip evacuation at high temperature

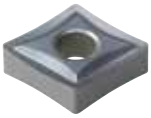
KORLOY

High Performance PVD Coated Turning Insert

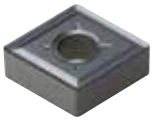
for Hard-to-cut Materials such as Heat Resistant Alloy and Stainless Steel



PC8100 Series (VP1 chip breaker) — For finishing (Continuous cutting)



PC8100 Series (VP2 chip breaker) — For medium cutting to finishing



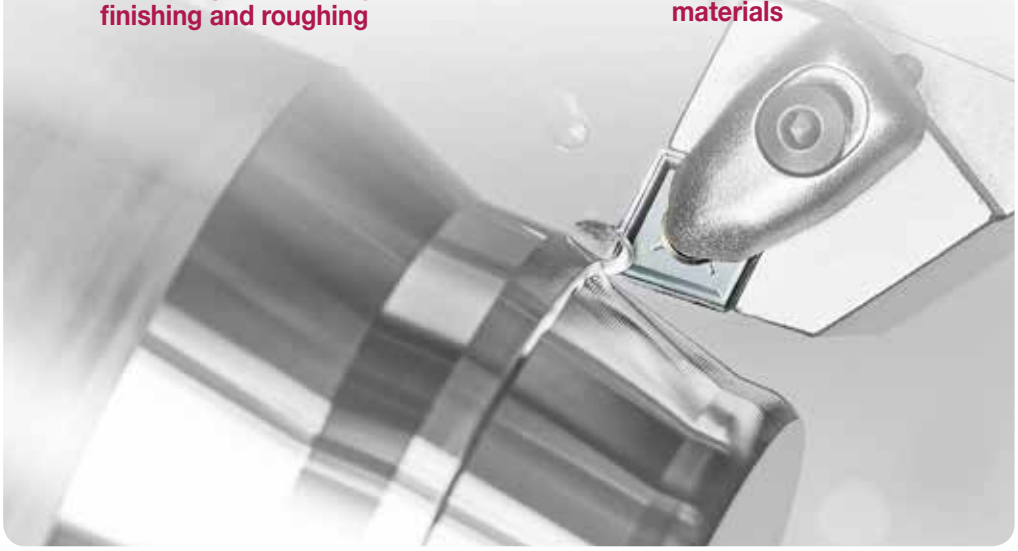
PC8100 Series (VP3 chip breaker) — For medium cutting

Heat resistant alloy(Inconel, etc.) causes high cutting force and temperature on cutting edges when being operated resulting from its properties of high strength at high temperature and low heat conductivity. Therefore, cutting velocity should be decreased as cutting tools go worn out. In addition, it accompanies chipping, breakage or notch wear in accordance with depth of cut due to thermal shock and work hardening. Thus, it is so important to select the most proper chip beaker and grade depending on your cutting velocity and cutting length and the other factors.

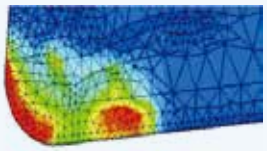
PC8105, PC8110 and **PC8115** are PVD turning grades for Heat resistant alloy.

PC8105 (S05) is a grade used for finishing heat resistant alloy and stainless steel with its characteristics of wear resistance in continuous operation at high speed and high temperature.
PC8110 (S10) is an universal grade used for medium cutting to finish of heat resistant alloy and stainless steel with its characteristics of wear resistance and chipping resistance in continuous operation at mid to high speed and high temperature.
PC8115 (S15) is an universal grade used for finish, medium cutting and roughing of heat resistant alloy and stainless steel with its characteristics of wear resistance and chipping resistance in various machining conditions.

- Stable tool life
  → Higher productivity
- Longer tool life and high removal rate
  → Difficult cutting conditions possible and shortened cutting time
- Perfect harmony between grades and chip breakers
  → Increased tool life
  → Various operation range such as finishing and roughing
- Proper to machine heat resistant alloy and stainless steel
  → Responsive to a wide range of hard-to-cut materials

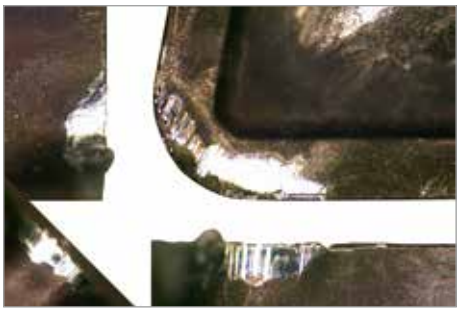


Troubles when Machining Hard-to-cut Materials

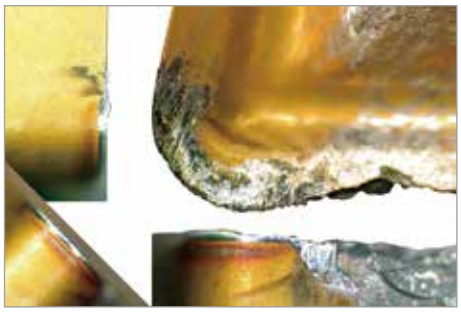


Hard-to-cut materials(Inconel, etc.) feature high hardness and low heat conductivity. This results in concentrated heat on cutting edges and thus rapid wear at a high temperature over 800°. In addition, thermal impact and work hardening cause involve chipping or breakage according to the depth of cut.

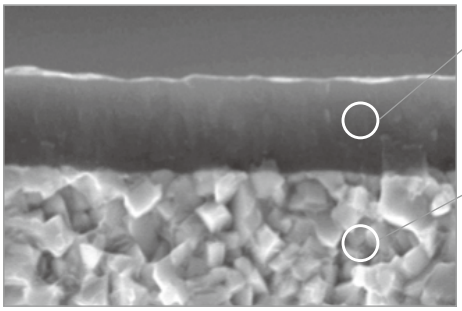
1. Severe wear



2. Chipping / fracture



Development of PC8100 Series

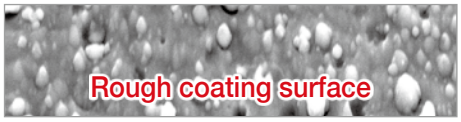


It prevents wear at a high temperature to apply excellent surface roughness and coating with oxidation resistance and high hardness.

It improves wear resistance to equalize submicron matrix, secure stability between corners and improve chipping and wear resistance

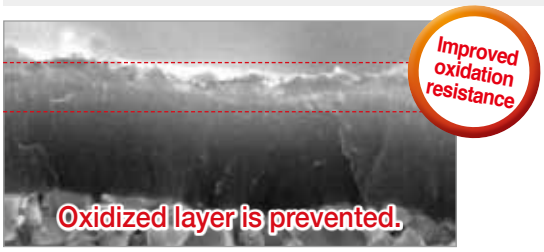
Coating surface treatment technology (Pictures of coating layer)

[PC8100 Series]



[Conventional coating]

Oxidation resistant coating technology (Pictures of coating layer heat-treated at 900°C)



[PC8100 Series]

[Competitor]

Development Effect

1. Increased wear resistance

[PC8105]

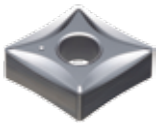
[Competitor S05]

2. Reduced chipping / fracture

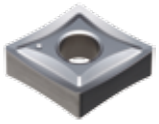
[PC8115]

[Competitor S15]

Carbide Insert Exclusive for Turning Application of Titanium Alloy



H01 / H05
(VP1 chip breaker)
For finishing
(Continuous cutting)



H01 / H05
(VP2 chip breaker)
For medium
cutting to finishing

H01 / H05
(VP3 chip breaker)
For medium
cutting

Titanium alloy is highly responsive to chemicals and built-up edges on blades frequently happen during operation, which in result causes rapid increase of cutting loads or unnecessary overlapped cutting actions.
Its characteristics of low heat conductivity and high work hardening trigger notch wear, while the low elasticity is blamed for elastic recovery and bending of workpieces. This is why chipping on cutting edges or breakage occurs on tools during operation. Therefore, it is important to select the best combination of exclusive grade and chip breaker for machining titanium alloy.

H01 and **H05** are specially designed for titanium alloy operation with its special surface treatment to prevent built-up edges and breakage, which in return increases tool life.

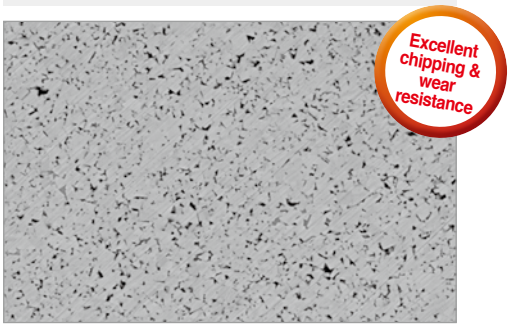
H01 (S05) is a grade used for finishing titanium alloy with its characteristics of a sharp cutting edge in continuous operation at high speed.

H05 (S15) is a grade highly recommended for medium cutting to finishing of titanium alloy in various machining conditions.

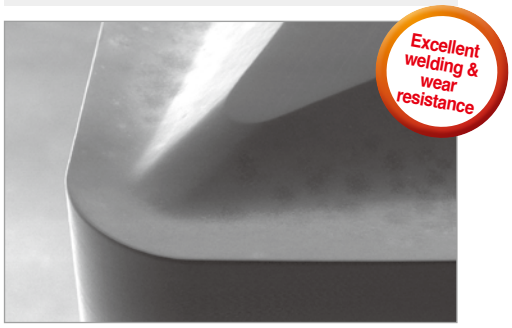
On top of that, we recommend a PVD coated universal grade, PC5300 in interrupted machining or roughing of titanium alloy.

H01 / H05 - Exclusive Grade for Machining Titanium Alloy

Cemented carbide substrate applied



Special surface treatment / sharp cutting edge

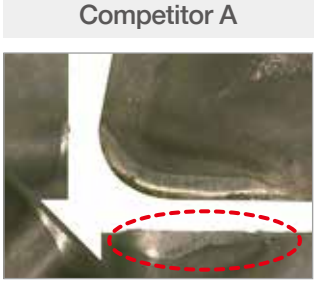


Troubles when Machining Titanium and Development Effect

Titanium alloy features high hardness and low heat conductivity.
This results in concentrated heat on cutting edges and thus rapid wear and flaking derived from built-up edge.

H01

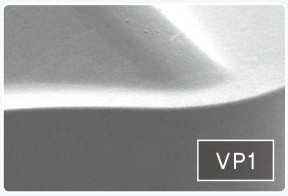
Competitor A

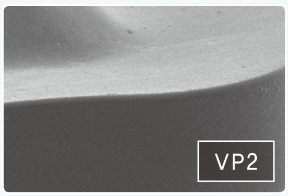


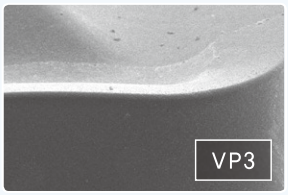
Competitor B

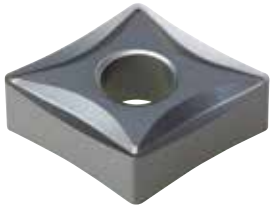
Features of VP Chip Breakers

Advanced technology enables sharp cutting edges and minimized cutting heat.



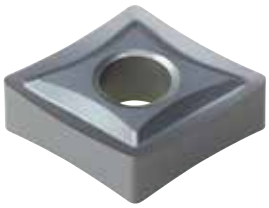






VP1 (For finishing-continuous cutting)

- Cutting edges designed in high-positive
  Reduced contact area between rake surface and chip minimizes cutting heat and improved tool life.
- Recommended cutting conditions
  fn(mm/rev) = 0.05~0.2, ap(mm) = 0.1~1.5



VP2 (For medium cutting to finishing)

- Cutting edges designed in high-positive / Side rake angle applied
  Stable chip control improves machinability when ball machining at variable depth of cut.
- Recommended cutting conditions
  fn(mm/rev) = 0.1~0.4, ap(mm) = 0.5~4.5

VP3 (For medium cutting)

- Cutting edges designed in high-positive / Wide land applied
  Improved stability at interrupted cutting when toughness is required. Stable chip control and machinability at high depth of cut.
- Recommended cutting conditions
  fn(mm/rev) = fn(mm/rev) = 0.1~0.45, ap(mm) = 0.5~5.0

Chip Breaker Line-up [Heat resistant alloy and stainless steel]

	Negative				Positive		
	Finishing (~1.0mm)	Medium cutting to finishing (~1.5mm)	Medium cutting (~3.0mm)	Roughing (~5.0mm)	Finishing (~1.0mm)	Medium cutting to finishing (~1.5mm)	Medium cutting (~2.5mm)
Continuous cutting	VP1 PC8105	VP2 PC8105	VP3 PC8110	MP PC8110	VP1 PC8105	VL PC8110	MP PC8110
General cutting	VP1 PC8115	VP2 PC8115	VP3 PC8115	MP PC8115	VP1 PC8115	VL PC8115	MP PC8115
Interrupted cutting	VP1 PC5300	VP2 PC5300	VP3 PC5300	MP PC5300	VP1 PC5300	VL PC5300	MP PC5300

Chip Breaker Line-up [Titanium alloy]

	Negative			Positive	
	Finishing (~1.0mm)	Medium cutting to finishing (~1.5mm)	Medium cutting (~3.0mm)	Finishing (~1.0mm)	Medium cutting to finishing (~1.5mm)
Continuous cutting	VP1 H01	VP2 H01	VP3 H05	VP1 H01	VL H01
General cutting	VP1 H05	VP2 H05	VP3 H05	VP1 H05	VL H05
Interrupted cutting	VP1 PC5300	VP2 PC5300	VP3 PC5300	VP1 PC5300	MP PC5300

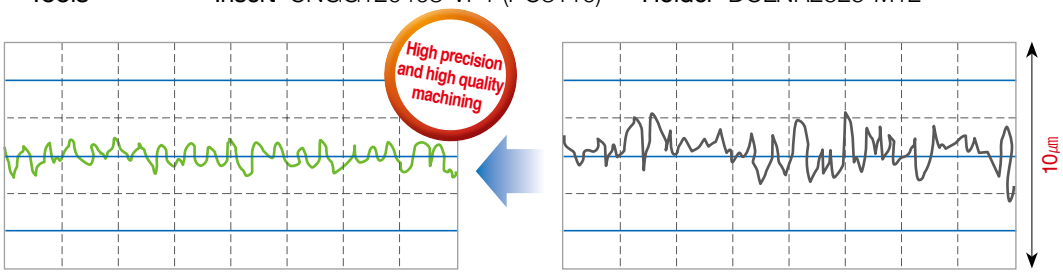
* Detailed recommended depth of cut per designation and insert shape differ according to nose R. Please see page 11~15p.

Performance Test

VP1 surface roughness performance test

- Workpiece: Inconel718
- Cutting conditions: vc(m/min) = 60, fn(mm/rev) = 0.1, ap(mm) = 0.2, wet
- Tools: Insert CNGG120408-VP1 (PC8110) Holder DCLNR2525-M12

VP1 chip breaker enables **high precision** and **high quality machining.**

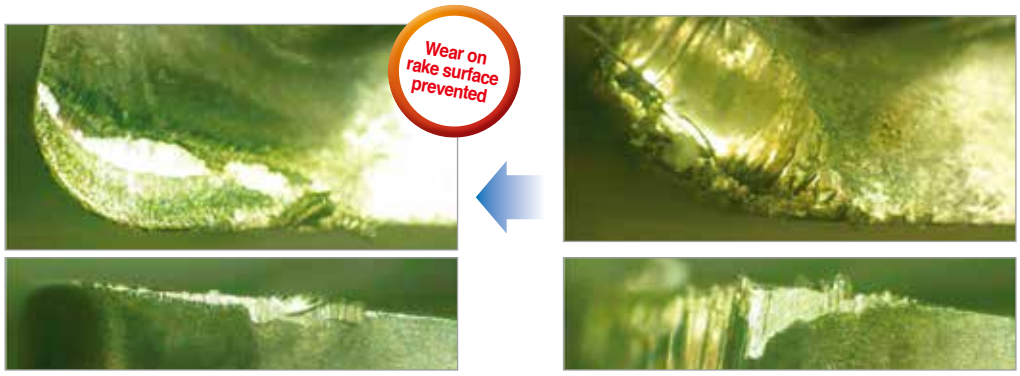


[KORLOY] [Competitor]

VP2 tool life test

- Workpiece: X5CrNi18-9 / X5CrNiMo17-12-2
- Cutting conditions: vc(m/min) = 200~120, fn(mm/rev) = 0.25, ap(mm) = 1.5, dry
- Tools: Insert CNMG120408-VP2 (PC8110) Holder DCLNR2525-M12

VP2 chip breaker prevents wear on rake surface of insert with excellent chip control when machining HRSA.

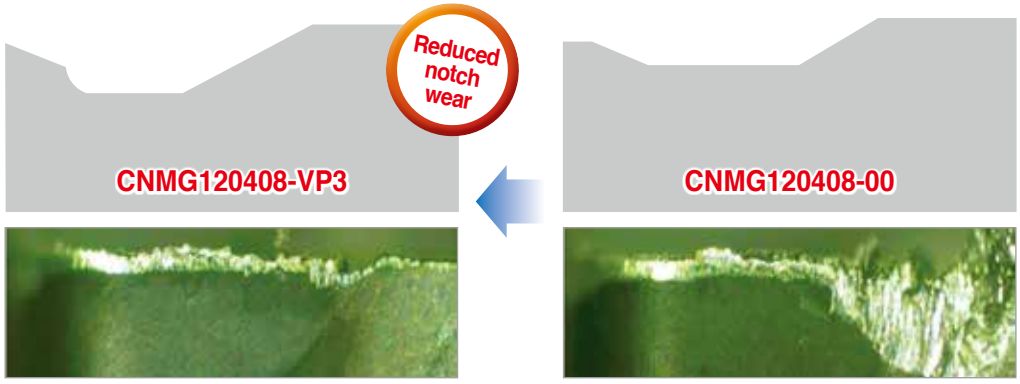


[KORLOY (After 300 passes)] [Competitor (After 300 passes)]

VP3 tool life test

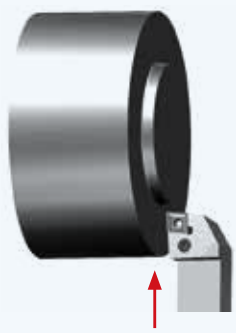
- Workpiece: Inconel718
- Cutting conditions: vc(m/min) = 60, fn(mm/rev) = 0.2, ap(mm) = 2.0, wet
- Tools: Insert CNMG120408-VP3 (PC8110) Holder DCLNR2525-M12

VP3 chip breaker prevents notch wear with sharp cutting edges and wide land.



[KORLOY (After 10 passes)] [Competitor (After 7 passes)]

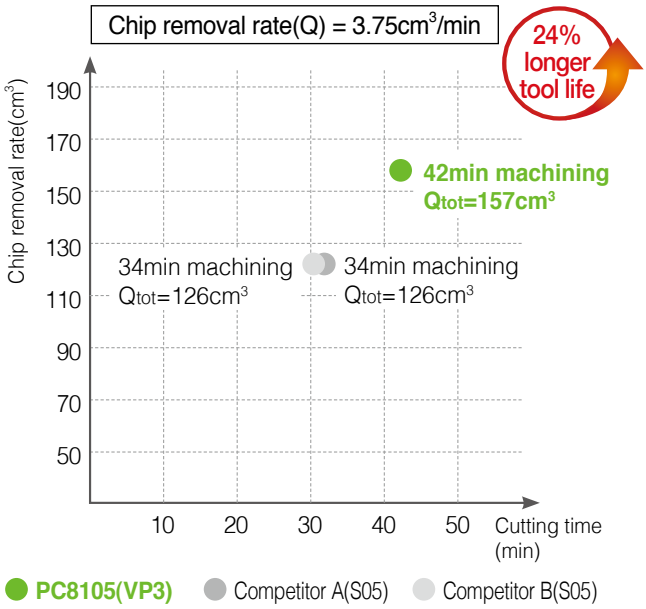
Performance Test

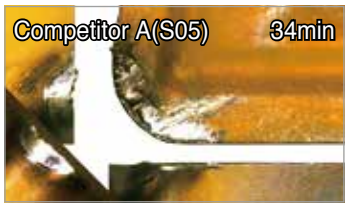


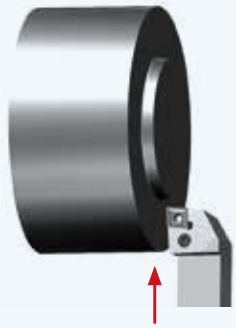
[Machining type]

PC8105 tool life test

- Workpiece: Inconel718
- Cutting conditions: vc(m/min) = 50, fn(mm/rev) = 0.15, ap(mm) = 0.5, wet
- Tools: Insert CNMG120408-VP3 (PC8105) Holder PCLNR2525-M12



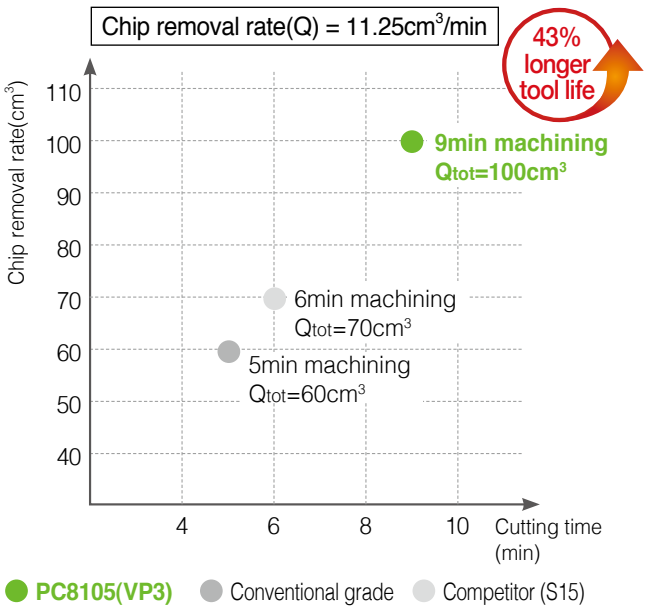




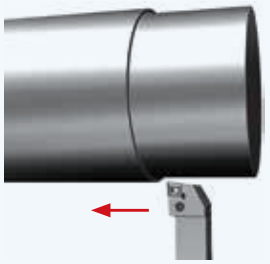
[Machining type]

PC8115 tool life test

- Workpiece: Inconel718
- Cutting conditions: vc(m/min) = 50, fn(mm/rev) = 0.15, ap(mm) = 1.5, wet
- Tools: Insert CNMG120408-VP3 (PC8115) Holder PCLNR2525-M12



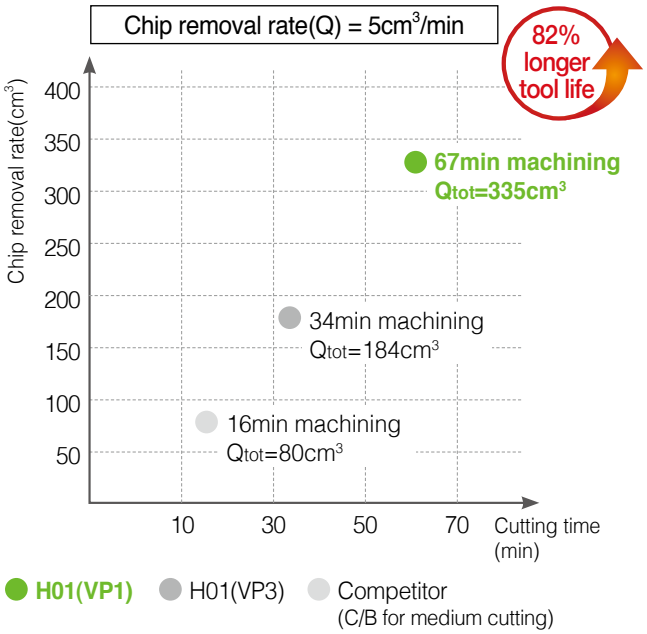
Performance Test

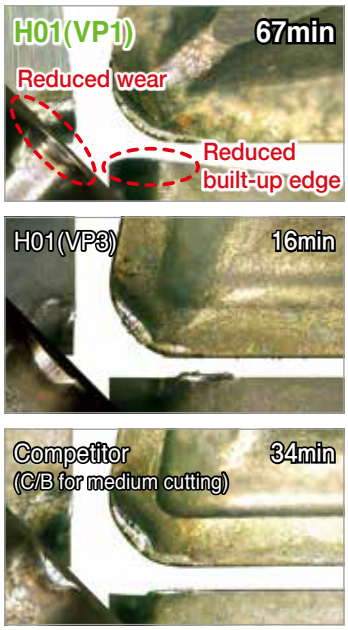


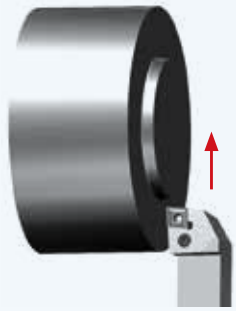
[Machining type]

H01 tool life test

- Workpiece Ti-6A-4V
- Cutting conditions vc(m/min) = 100, fn(mm/rev) = 0.1, ap(mm) = 0.5, wet
- Tools Insert CNMG120408-VP1 (H01) Holder PCLNR2525-M12



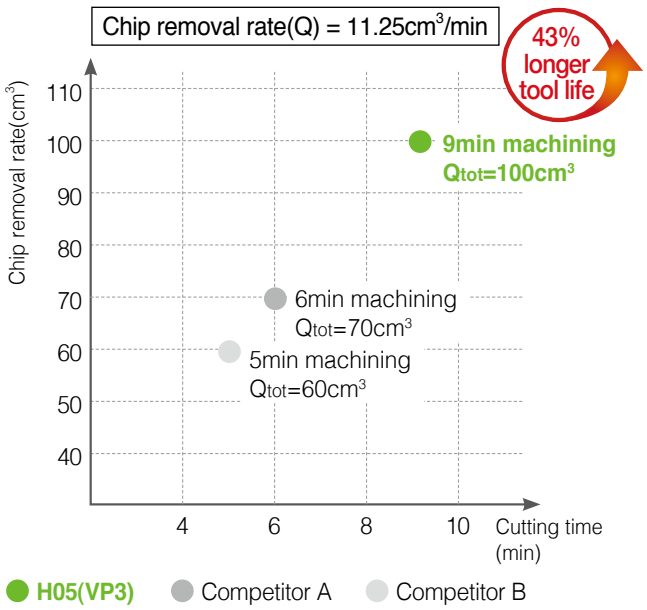


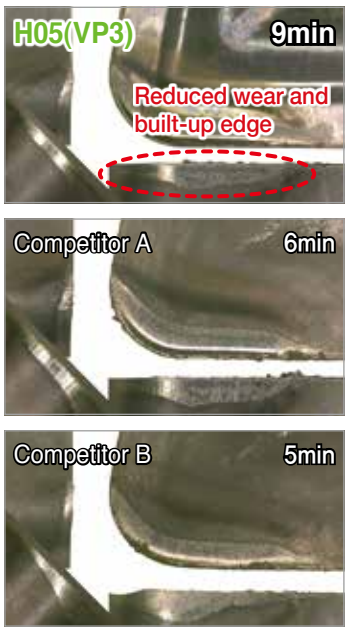


[Machining type]

H05 tool life test

- Workpiece Ti-6Al-4V
- Cutting conditions vc(m/min) = 80, fn(mm/rev) = 0.2, ap(mm) = 2.0, wet
- Tools Insert CNMG120408-VP3 (H05) Holder PCLNR2525-M12





Application Example

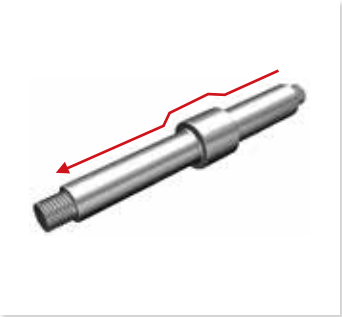
Pipe ring

- Workpiece: Inconel718, H_RC 46, Ø300
- Cutting conditions: vc(m/min) = 30, fn(mm/rev) = 0.2, ap(mm) = 1.0, wet
- Tools: Insert CNMG120408–VP3 (PC8105)

PC8105	4ea/corner
Competitor	2ea/corner

100% longer

➔ 100% longer tool life per corner



Parts for general machine

- Workpiece: X2CrNiMo17-12-2, H_RC 22, Ø30
- Cutting conditions: vc(m/min) = 80, fn(mm/rev) = 0.2, ap(mm) = 7.0, wet
- Tools: Insert CNMG120408–VP3 (PC8115)

PC8115	6ea/corner
Competitor	3ea/corner

100% longer

➔ 100% longer tool life per corner

Parts for Industrial machine

- Workpiece: Ti-6Al-4V, H_RC 50, Ø200
- Cutting conditions: vc(m/min) = 60, fn(mm/rev) = 0.2, ap(mm) = 0.8, wet
- Tools: Insert CNMG120408–VP2 (H01)

H01	12ea/corner
Competitor	8ea/corner

50% longer

➔ 50% longer tool life per corner

Parts for Industrial machine

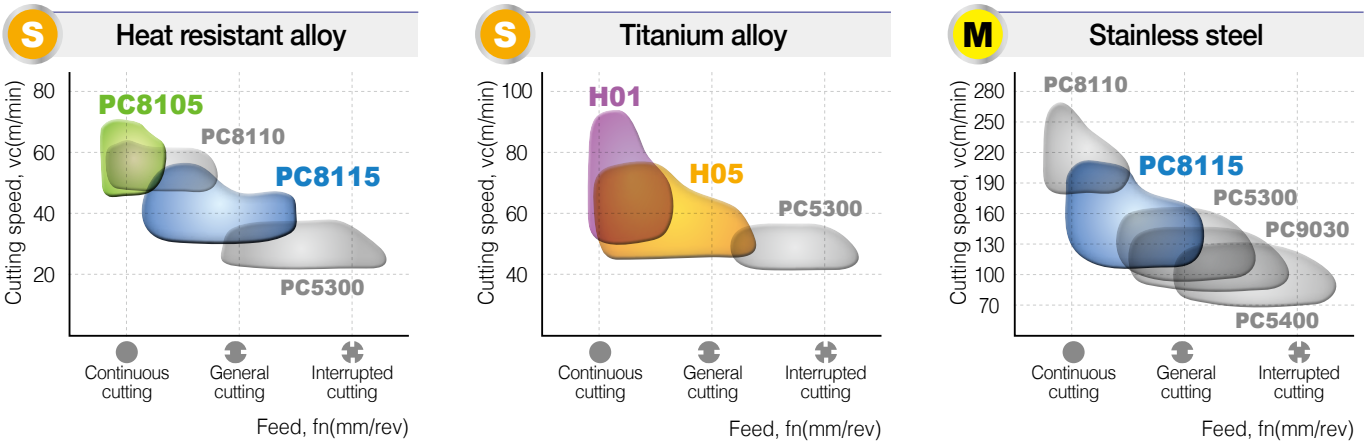
- Workpiece: Ti-6Al-4V, H_RC 47, Ø50~Ø70
- Cutting conditions: vc(m/min) = 50, fn(mm/rev) = 0.15, ap(mm) = 2.0, wet
- Tools: Insert CNMG120408–VP3 (H05)

H05	15ea/corner
Competitor	13ea/corner

15% longer

➔ 15% longer tool life per corner

Grade Line-up



Turning Grade Comparison [Heat resistant alloy / STS]

ISO	KORLOY	Competitor A	Competitor B	Competitor C	Competitor D	Competitor E	Competitor F	Competitor G
S05	**PC8105**	S05F	MP9005 VP05RT	IC808	PR1305	TT5080	TS2000	WSM10
S10	**PC8110**	GC1105	VP10RT	IC907	PR1310			
S15	**PC8115**	GC1115	MP9015	-	-			
S25	**PC5300**	GC1125 GC2025	VP15TF VP20MF	IC908	PR1125 PR1325	TT9030 TT9080	CP500 TS2500	WSM20
S35	**PC5400**	GC2035	MP7035	IC328	PR660	TT8020 TT8080	TM4000 F40M	WSM30

Turning Grade Comparison [Titanium alloy]

ISO	KORLOY	Competitor A	Competitor B	Competitor C	Competitor D	Competitor E	Competitor F	Competitor G
S05	**H01**	-	-	-	-	-	-	-
S15	**H05**	H13A	MT9015	IC20	-	TT5080	THR	WS10
S25	**PC5300**	GC1125	RT9015	IC908	PR1125 PR1325	TT9030 TT9080	CP500 TS2500	WSM20

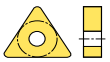
Turning Grade Comparison [HRSA (Heat resistant alloy / Titanium alloy)]

ISO	KORLOY	Competitor A	Competitor B	Competitor C	Competitor D	Competitor E	Competitor F	Competitor G
R (Roughing)	**MP**	SMR	RS, GJ	TF	MS	ET	MR4	NRT, NRS
M (Medium cutting)	**VP3**	SM	MS	VL	MU	EM	MR3	NMS
L (Medium cutting to finishing)	**VP2**	NGP	MJ	PP	TK	ML	MF1	NMT
F (Finishing)	**VP1**	SF	LS, FJ	SF	MQ	EA	M1	NFT

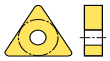
Available Stock [Negative_VP1]

Shape	Designation		Class	PVD Coated				Non Coated		Cutting conditions	
				PC8105	PC8110	PC8115	PC5300	H01	H05	Depth of cut ap(mm)	Feed fn(mm/rev)
	CNMG	120404-VP1	M	●	●	-	-	●	-	0.10 ~ 1.50	0.05 ~ 0.15
		120408-VP1	M	●	●	-	-	●	-	0.10 ~ 1.50	0.07 ~ 0.20
	DNMG	150404-VP1	M	●	●	●	-	●	●	0.10 ~ 1.50	0.05 ~ 0.15
		150408-VP1	M	●	●	●	-	●	●	0.10 ~ 1.50	0.07 ~ 0.20
		150604-VP1	M	●	-	●	-	-	-	0.10 ~ 1.50	0.05 ~ 0.15
		150608-VP1	M	-	-	●	-	-	-	0.10 ~ 1.50	0.07 ~ 0.20

Available Stock [Negative_VP2]

Shape	Designation		Class	PVD Coated				Non Coated		Cutting conditions	
				PC8105	PC8110	PC8115	PC5300	H01	H05	Depth of cut ap(mm)	Feed fn(mm/rev)
	CNMG	120404-VP2	M	●	●	●	●	●	-	0.10 ~ 3.00	0.05 ~ 0.30
		120408-VP2	M	●	●	●	●	●	-	0.50 ~ 4.50	0.10 ~ 0.40
	DNMG	150404-VP2	M	●	●	●	●	●	-	0.10 ~ 3.00	0.05 ~ 0.30
		150408-VP2	M	●	●	●	●	●	-	0.50 ~ 4.50	0.10 ~ 0.40
		150604-VP2	M	●	●	●	●	●	-	0.10 ~ 3.00	0.05 ~ 0.30
		150608-VP2	M	●	●	●	●	●	-	0.50 ~ 4.50	0.10 ~ 0.40
	SNMG	120404-VP2	M	●	●	●	●	●	-	0.10 ~ 3.00	0.05 ~ 0.35
		120408-VP2	M	●	●	●	●	●	-	0.50 ~ 4.50	0.10 ~ 0.45
		120412-VP2	M	●	●	●	●	●	-	0.50 ~ 5.00	0.10 ~ 0.50
	TNMG	160404-VP2	M	●	●	●	●	●	-	0.10 ~ 3.00	0.05 ~ 0.35
		160408-VP2	M	●	●	●	●	●	-	0.50 ~ 4.50	0.10 ~ 0.45
		160412-VP2	M	●	●	●	-	●	-	0.50 ~ 5.00	0.10 ~ 0.50
		220404-VP2	M	-	●	-	●	-	-	0.10 ~ 5.00	0.05 ~ 0.35
		220408-VP2	M	-	●	-	●	-	-	0.10 ~ 5.00	0.10 ~ 0.45
	WNMG	080404-VP2	M	-	●	-	●	-	-	0.50 ~ 4.50	0.10 ~ 0.40
		080408-VP2	M	●	●	●	●	●	-	0.50 ~ 4.50	0.10 ~ 0.40
		080412-VP2	M	●	●	●	●	●	-	0.50 ~ 4.50	0.10 ~ 0.40

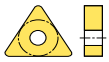
Available Stock [Negative_VP3]

Shape	Designation		Class	PVD Coated				Non Coated		Cutting conditions	
				PC8105	PC8110	PC8115	PC5300	H01	H05	Depth of cut ap(mm)	Feed fn(mm/rev)
	CNGG	120404-VP3	G	●	●	●	-	●	-	0.10 ~ 3.00	0.05 ~ 0.30
		120408-VP3	G	●	●	●	-	●	-	0.50 ~ 5.00	0.10 ~ 0.45
		120412-VP3	G	●	●	●	-	●	-	0.50 ~ 5.00	0.12 ~ 0.50
	CNMG	120404-VP3	M	●	●	●	●	●	●	0.10 ~ 3.00	0.05 ~ 0.30
		120408-VP3	M	●	●	●	●	●	●	0.50 ~ 5.00	0.10 ~ 0.45
		120412-VP3	M	●	●	●	●	●	●	0.50 ~ 5.00	0.12 ~ 0.50
	DNGG	150404-VP3	G	●	●	●	-	●	-	0.10 ~ 3.00	0.05 ~ 0.30
		150408-VP3	G	●	●	●	-	●	-	0.50 ~ 5.00	0.10 ~ 0.45
		150412-VP3	G	●	●	●	-	●	-	0.50 ~ 5.00	0.12 ~ 0.50
		150604-VP3	G	●	●	●	-	●	-	0.10 ~ 3.00	0.05 ~ 0.30
		150608-VP3	G	●	●	●	-	●	-	0.50 ~ 5.00	0.10 ~ 0.45
		150612-VP3	G	●	●	●	-	●	-	0.50 ~ 5.00	0.12 ~ 0.50
	DNMG	150404-VP3	M	●	●	●	●	●	●	0.10 ~ 3.00	0.05 ~ 0.30
		150408-VP3	M	●	●	●	●	●	●	0.50 ~ 5.00	0.10 ~ 0.45
		150412-VP3	M	●	●	●	●	●	●	0.50 ~ 5.00	0.12 ~ 0.50
		150604-VP3	M	●	●	●	●	●	●	0.10 ~ 3.00	0.05 ~ 0.30
		150608-VP3	M	●	●	●	●	●	●	0.50 ~ 5.00	0.10 ~ 0.45
		150612-VP3	M	●	●	●	●	●	●	0.50 ~ 5.00	0.12 ~ 0.50
	SNGG	120404-VP3	G	●	●	●	-	●	-	0.10 ~ 3.00	0.05 ~ 0.30
		120408-VP3	G	●	●	●	-	●	-	1.00 ~ 5.00	0.10 ~ 0.45
		120412-VP3	G	●	●	●	-	●	-	1.00 ~ 5.00	0.12 ~ 0.50
	SNMG	120404-VP3	M	●	●	●	●	●	●	0.10 ~ 3.00	0.05 ~ 0.30
		120408-VP3	M	●	●	●	●	●	●	1.00 ~ 5.00	0.10 ~ 0.45
		120412-VP3	M	●	●	●	●	●	●	1.00 ~ 5.00	0.12 ~ 0.50
	TNGG	160404-VP3	G	●	●	●	-	●	-	0.10 ~ 3.00	0.05 ~ 0.30
		160408-VP3	G	●	●	●	-	●	-	0.50 ~ 5.00	0.10 ~ 0.45
	TNMG	160404-VP3	M	●	●	●	●	●	●	0.10 ~ 3.00	0.05 ~ 0.30
		160408-VP3	M	●	●	●	●	●	●	0.50 ~ 5.00	0.10 ~ 0.45
	VNGG	160404-VP3	G	●	●	●	-	●	-	0.10 ~ 3.00	0.05 ~ 0.30
		160408-VP3	G	-	-	-	-	-	-	0.50 ~ 5.00	0.10 ~ 0.45

Available Stock [Negative_VP3]

Shape	Designation		Class	PVD Coated				Non Coated		Cutting conditions	
				PC8105	PC8110	PC8115	PC5300	H01	H05	Depth of cut ap(mm)	Feed fn(mm/rev)
	VNMG	160404-VP3	M	●	●	●	●	●	●	0.10 ~ 3.00	0.05 ~ 0.30
		160408-VP3	M	●	●	●	●	●	●	0.50 ~ 5.00	0.10 ~ 0.45
	WNMG	080404-VP3	M	●	●	●	●	●	●	0.50 ~ 5.00	0.10 ~ 0.45
		080408-VP3	M	●	●	●	●	●	●	0.50 ~ 5.00	0.12 ~ 0.50
		080412-VP3	M	●	●	●	●	●	●	0.10 ~ 3.00	0.05 ~ 0.30

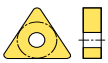
Available Stock [Negative_MP]

Shape	Designation		Class	PVD Coated				Non Coated		Cutting conditions	
				PC8105	PC8110	PC8115	PC5300	H01	H05	Depth of cut ap(mm)	Feed fn(mm/rev)
	CNMG	120404-MP	M	●	●	●	-	-	-	0.40 ~ 4.00	0.10 ~ 0.40
		120408-MP	M	●	●	●	-	-	-	0.50 ~ 4.50	0.15 ~ 0.45
		120412-MP	M	●	●	-	-	-	-	0.80 ~ 5.00	0.15 ~ 0.50
	DNMG	150404-MP	M	-	●	-	-	-	-	0.40 ~ 4.00	0.10 ~ 0.40
		150408-MP	M	●	●	-	-	-	-	0.50 ~ 4.50	0.15 ~ 0.45
		150412-MP	M	●	●	-	-	-	-	0.80 ~ 5.00	0.15 ~ 0.50
		150604-MP	M	●	●	-	-	-	-	0.40 ~ 4.00	0.10 ~ 0.40
		150608-MP	M	●	●	-	-	-	-	0.50 ~ 4.50	0.15 ~ 0.45
		150612-MP	M	●	●	-	-	-	-	0.80 ~ 5.00	0.15 ~ 0.50
	SNMG	120404-MP	M	●	●	-	-	-	-	0.40 ~ 4.00	0.10 ~ 0.40
		120408-MP	M	●	●	-	-	-	-	0.50 ~ 4.50	0.15 ~ 0.45
	TNMG	160404-MP	M	●	●	-	-	-	-	0.40 ~ 3.50	0.10 ~ 0.40
		160408-MP	M	●	●	-	-	-	-	0.50 ~ 4.00	0.15 ~ 0.45
		160412-MP	M	●	●	-	-	-	-	0.80 ~ 4.50	0.15 ~ 0.50
	VNMG	160404-MP	M	●	●	-	-	-	-	0.40 ~ 3.50	0.10 ~ 0.40
		160408-MP	M	●	●	-	-	-	-	0.50 ~ 4.00	0.15 ~ 0.45
	WNMG	080404-MP	M	●	●	●	-	-	-	0.40 ~ 4.00	0.10 ~ 0.40
		080408-MP	M	●	●	●	-	-	-	0.50 ~ 4.50	0.15 ~ 0.45
		080412-MP	M	●	●	-	-	-	-	0.80 ~ 5.00	0.15 ~ 0.50

Available Stock [Positive_VP1]

Shape	Designation		Class	PVD Coated				Non Coated		Cutting conditions	
				PC8105	PC8110	PC8115	PC5300	H01	H05	Depth of cut ap(mm)	Feed fn(mm/rev)
	CCGT	060201-VP1	G	●	●	●	●	●	-	0.03 ~ 0.06	0.06 ~ 1.00
		060202-VP1	G	●	●	●	●	●	-	0.03 ~ 0.10	0.08 ~ 1.50
		060204-VP1	G	●	●	●	●	●	-	0.05 ~ 0.12	0.10 ~ 1.50
		09T301-VP1	G	●	●	●	●	●	-	0.03 ~ 0.13	0.06 ~ 1.00
		09T302-VP1	G	●	●	●	●	●	-	0.04 ~ 0.15	0.08 ~ 1.50
		09T304-VP1	G	●	●	●	●	●	-	0.06 ~ 0.20	0.10 ~ 1.50
	DCGT	070201-VP1	G	●	●	●	●	●	-	0.03 ~ 0.06	0.06 ~ 1.00
		070202-VP1	G	●	●	●	●	●	-	0.03 ~ 0.10	0.08 ~ 1.50
		070204-VP1	G	●	●	●	●	●	-	0.05 ~ 0.12	0.10 ~ 1.50
		11T301-VP1	G	●	●	●	●	●	-	0.03 ~ 0.13	0.06 ~ 1.00
		11T302-VP1	G	●	●	●	●	●	-	0.04 ~ 0.15	0.08 ~ 1.50
		11T304-VP1	G	●	●	●	●	●	-	0.06 ~ 0.20	0.10 ~ 1.50
	VCGT	110301-VP1	G	●	●	●	●	●	-	0.02 ~ 0.15	0.05 ~ 0.50
		110302-VP1	G	●	●	●	●	●	-	0.02 ~ 0.18	0.10 ~ 1.00
		110304-VP1	G	●	●	●	●	●	-	0.03 ~ 0.18	0.15 ~ 1.20
	VPGT	110301-VP1	G	●	●	●	●	●	-	0.02 ~ 0.15	0.05 ~ 0.50
		110302-VP1	G	●	●	●	●	●	-	0.02 ~ 0.18	0.10 ~ 1.00
		110304-VP1	G	●	●	●	●	●	-	0.03 ~ 0.18	0.15 ~ 1.20

Available Stock [Positive_VL]

Shape	Designation		Class	PVD Coated				Non Coated		Cutting conditions	
				PC8105	PC8110	PC8115	PC5300	H01	H05	Depth of cut ap(mm)	Feed fn(mm/rev)
	CCMT	060204-VL	M	●	●	●	●	-	-	0.08 ~ 0.90	0.04 ~ 0.10
		09T304-VL	M	●	●	●	●	●	●	0.10 ~ 1.00	0.05 ~ 0.10
		09T308-VL	M	●	●	●	●	●	●	0.10 ~ 1.00	0.08 ~ 0.15
	DCMT	070202-VL	M	-	-	-	-	-	●	0.06 ~ 0.80	0.02 ~ 0.10
		070204-VL	M	●	●	●	●	●	●	0.08 ~ 0.90	0.04 ~ 0.10
		11T302-VL	M	-	-	-	-	-	●	0.07 ~ 0.80	0.03 ~ 0.10
		11T304-VL	M	-	●	-	●	-	●	0.10 ~ 1.00	0.05 ~ 0.10
		11T308-VL	M	●	●	●	●	●	●	0.10 ~ 1.00	0.08 ~ 0.15
	SCMT	09T304-VL	M	●	●	●	●	-	-	0.10 ~ 1.00	0.05 ~ 0.10
		90T308-VL	M	-	●	●	●	-	-	0.10 ~ 1.00	0.08 ~ 0.15
	TCMT	16T304-VL	M	●	●	●	●	-	-	0.30 ~ 1.50	0.05 ~ 0.20
		16T308-VL	M	●	●	●	●	-	-	0.30 ~ 1.50	0.05 ~ 0.20
	TPMT	110304-VL	M	●	●	●	●	-	-	0.08 ~ 0.90	0.04 ~ 0.10

Available Stock [Positive_VL]

Shape	Designation		Class	PVD Coated				Non Coated		Cutting conditions	
				PC8105	PC8110	PC8115	PC5300	H01	H05	Depth of cut ap(mm)	Feed fn(mm/rev)
	VBMT	160404-VL	M	●	●	●	●	-	-	0.30 ~ 1.50	0.05 ~ 0.20
		160408-VL	M	●	●	●	●	-	-	0.30 ~ 1.50	0.10 ~ 0.20
		160412-VL	M	●	●	●	-	-	-	0.30 ~ 1.50	0.10 ~ 0.25
	VCMT	160404-VL	M	●	●	-	-	-	-	0.30 ~ 1.50	0.05 ~ 0.20
		160408-VL	M	●	●	-	-	-	-	0.30 ~ 1.50	0.10 ~ 0.20

Available Stock [Positive_MP]

Shape	Designation		Class	PVD Coated				Non Coated		Cutting conditions	
				PC8105	PC8110	PC8115	PC5300	H01	H05	Depth of cut ap(mm)	Feed fn(mm/rev)
	CCMT	060202-MP	M	●	●	●	●	-	-	0.20 ~ 1.50	0.04 ~ 0.12
		060204-MP	M	●	●	●	●	-	-	0.30 ~ 1.50	0.05 ~ 0.15
		09T302-MP	M	●	●	●	●	-	-	0.30 ~ 2.00	0.07 ~ 0.15
		09T304-MP	M	●	●	●	●	-	-	0.50 ~ 2.50	0.08 ~ 0.25
		09T308-MP	M	●	●	●	●	-	-	0.50 ~ 2.50	0.10 ~ 0.30
	DCMT	070202-MP	M	●	●	●	●	-	-	0.12 ~ 1.80	0.04 ~ 0.12
		070204-MP	M	●	●	●	●	-	-	0.30 ~ 1.80	0.05 ~ 0.15
		070208-MP	M	●	●	●	●	-	-	0.30 ~ 1.80	0.08 ~ 0.22
		11T302-MP	M	●	●	●	●	-	-	0.30 ~ 2.00	0.04 ~ 0.15
		11T304-MP	M	●	●	●	●	-	-	0.50 ~ 2.30	0.08 ~ 0.20
		11T308-MP	M	●	●	●	●	-	-	0.50 ~ 2.30	0.10 ~ 0.30
	SCMT	09T304-MP	M	●	●	-	-	-	-	0.30 ~ 2.80	0.05 ~ 0.25
		09T308-MP	M	●	●	-	-	-	-	0.50 ~ 2.80	0.10 ~ 0.30
		120408-MP	M	●	●	-	-	-	-	0.80 ~ 3.50	0.15 ~ 0.35
	TCMT	110202-MP	M	●	●	-	-	-	-	0.20 ~ 1.50	0.03 ~ 0.12
		110204-MP	M	●	●	-	-	-	-	0.20 ~ 1.t50	0.05 ~ 0.15
		110208-MP	M	●	●	-	-	-	-	0.25 ~ 2.00	0.10 ~ 0.28
		16T304-MP	M	●	●	●	●	-	-	0.30 ~ 2.50	0.08 ~ 0.20
		16T308-MP	M	●	●	●	●	-	-	0.50 ~ 2.50	0.10 ~ 0.30
		16T312-MP	M	●	●	●	-	-	-	0.50 ~ 2.50	0.20 ~ 0.40
	TPMT	110304-MP	M	-	-	-	●	-	-	0.20 ~ 1.50	0.05 ~ 0.20
		-	-	-	-	-	-	-	-	-	-
	VBMT	160404-MP	M	●	●	●	●	-	-	0.30 ~ 2.00	0.08 ~ 0.20
		160408-MP	M	●	●	●	●	-	-	0.50 ~ 2.30	0.10 ~ 0.25
		160412-MP	M	●	●	●	●	-	-	0.50 ~ 2.30	0.10 ~ 0.35
	VCMT	160404-MP	M	●	●	-	-	-	-	0.30 ~ 2.00	0.08 ~ 0.18
		160408-MP	M	●	●	-	-	-	-	0.50 ~ 2.30	0.10 ~ 0.23
		160412-MP	M	●	●	-	-	-	-	0.50 ~ 2.30	0.10 ~ 0.33

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