KORLOY
TECH-NEWS

PC2505 / PC2510



Insert Series for High Hardened Steel

Roughing grade series for high hardened steel

- **Ideally Suited for High Hardened Steel, Tool Steel and Pre-Hardened Steel**
  PC2505 (for high hardened steel ≥ HRC45)
  PC2510 (for high hardened / pre-hardened steel ≤ HRC35~50)
- **High Feed and High Efficiency Machining**
  Combination with high feed tools will deliver higher productivity and stable tool life in high feed and high hardness machining



KORLOY

Roughing Grade Series for High Hardened Steels

for High Hardened Steel, Tool Steel and Pre-Hardened Steel



PC2505 For high hardened steel (≥ HRC45)



PC2510 For high hardened steel and pre-hardened steel (≥ HRC35~50)

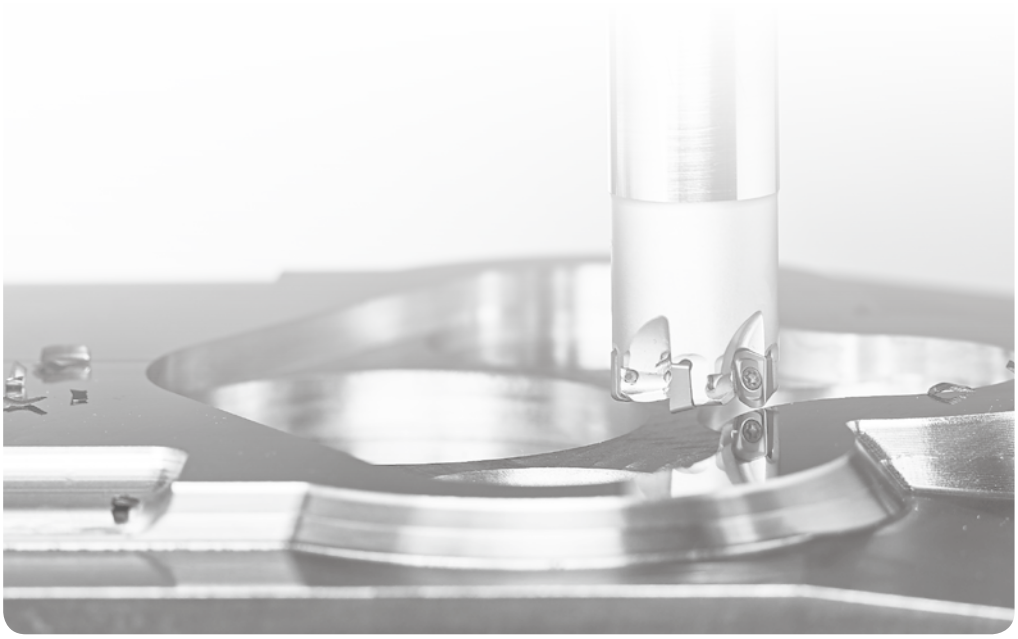
Machining workpieces with high hardness over HRC40 generally involves rapid tool wear due to friction between tools and workpieces. Machining speed should be lower due to high impacts caused by high hardness of workpiece. But lower speed cutting may cause built-up edge and chipping which affect shortened tool life.

KORLOY provides an advanced milling solution for machining those high hardened steels.

The **PC2505** is a grade for workpieces with ultra high hardness.
Its excellent wear resistance helps extend tool life when machining pressed die steel and heat treated steels of high hardness over HRC45.

PC2510 is a grade for machining high hardened steel and pre-hardened steel.
Its high toughness ultrafine substrate is ideal for interrupted cutting of high hardened steel and wet cutting with massive thermal shock.



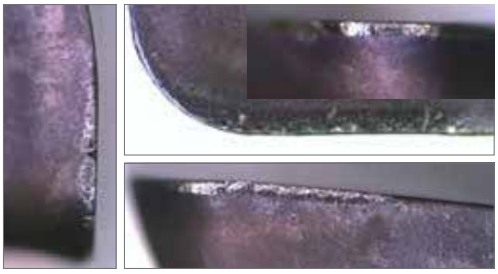


Common Problems when Machining High Hardened Steels

1. Chipping on cutting edges

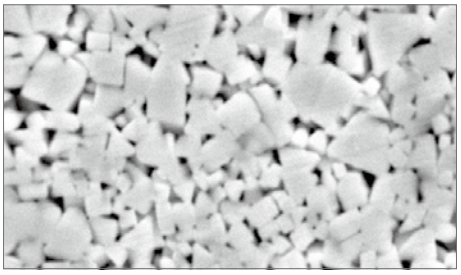


2. Rapid edge wear

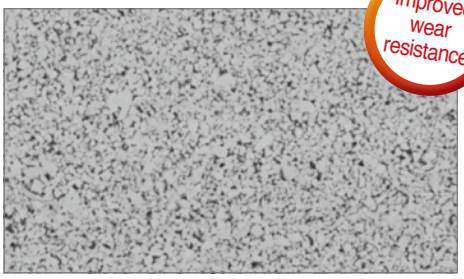


Development of the PC2500 Series

Ultra fine substrate with high toughness



[Fine grade]



[Ultrafine grade]

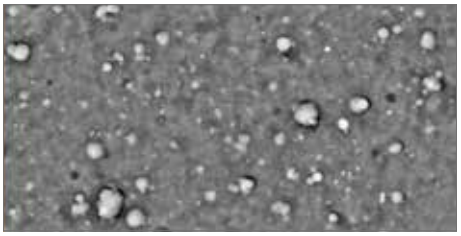
Surface Treatment



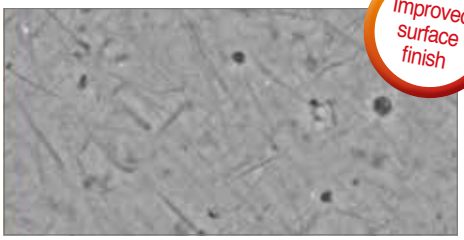
[Normal insert]



[New insert after surface treatment]



[Normal coating]

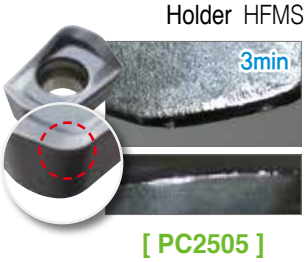


[After surface treatment]

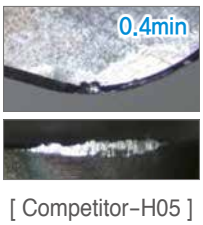
Development Effect

1. Increased wear resistance

- Workpiece: Heat treated SKD11 (H_RC45)
- Cutting conditions: vc(m/min) = 80, fz(mm/t) = 0.5, ap(mm) = 0.3, ae(mm) = 10, dry
- Tools: Insert LPEW040210R-C (PC2505), Holder HFMS1010HR-2S10



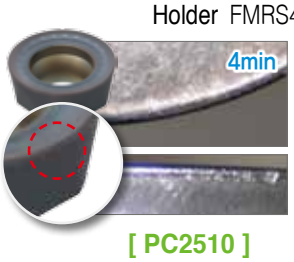
[PC2505]



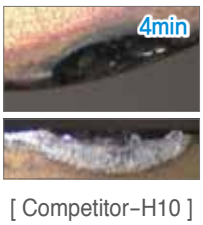
[Competitor-H05]

2. Increased chipping resistance

- Workpiece: Heat treated SKD11 (H_RC60)
- Cutting conditions: vc(m/min) = 30, fz(mm/t) = 0.4, ap(mm) = 0.7, ae(mm) = 40, dry
- Tools: Insert RPMW1204M0S1 (PC2510), Holder FMRS4050HRP-4M40



[PC2510]



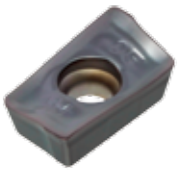
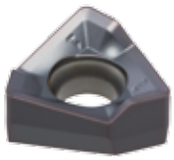
[Competitor-H10]

PC2505 / PC2510

Main Applied Products

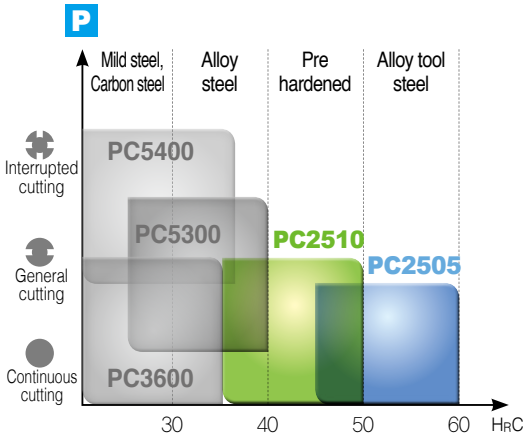
- Combination of the PC2500 series and high feed tools will deliver higher productivity in high hardened steels when high speed machining is not readily available.

FMR	HRMD	HRM	HFM
			

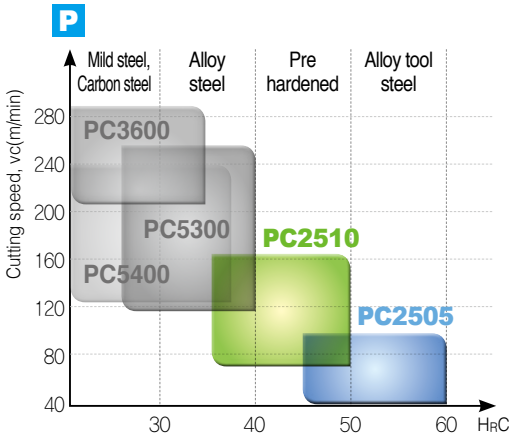
Alpha Mill	RM3	GBE
		

Application Guideline by Workpiece Type

Recommended grades for steel workpieces and their cutting conditions



[Workpiece hardness]



[Workpiece hardness]

Features of Each Grade

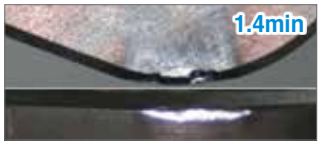
Grade	Workpiece hardness	Features
PC2505	≥ HRC45	Ideal for heat treated steel and high hardened steel due to excellent wear resistance
PC2510	HRC35~50	Ideal for high hardened steel and pre-hardened steel thanks to excellent impact resistance
PC5300	HRC20~40	Universal grade ideal for pre-hardened steel and general steels thanks to excellent wear resistance
PC5400	≤ HRC37	Universal grade with high toughness, ideal for general steels and hard-to-cut steel materials
PC3600	≤ HRC35	Ideal for general steels and pre-hardened steel thanks to excellent thermal resistance

Performance Test

PC2505 Performance (HFM)

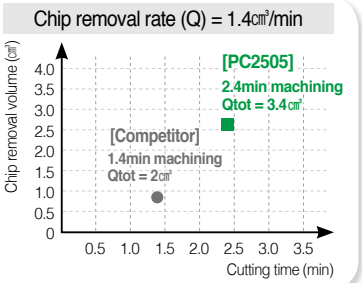


[PC2505]



[Competitor]

- Workpiece: X155CrVMo12-1* (HRC60)
- Cutting conditions: vc(m/min) = 75
  fz(mm/t) = 0.4
  ap(mm) = 0.15
  ae(mm) = 10, Air
- Tools: Insert LPEW040210R (PC2505)
  Holder HFMS1010HR-2S10



70% larger cutting volume compared to the competitor

PC2505 Performance (Alpha Mill)

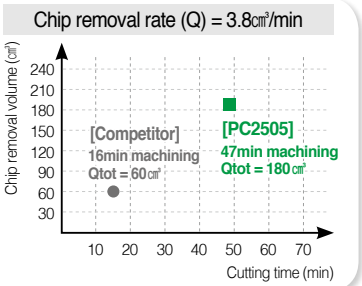


[PC2505]



[Competitor]

- Workpiece: Heat treated X155CrVMo12-1* (HRC50)
- Cutting conditions: vc(m/min) = 60
  fz(mm/t) = 0.1
  ap(mm) = 10
  ae(mm) = 10, Wet
- Tools: Insert APMT1604PDSR-MM (PC2505)
  Holder AMS3050HS



300% larger cutting volume compared to the competitor

PC2510 Performance (Alpha Mill)

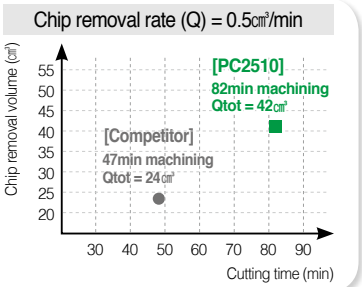


[PC2510]



[Competitor]

- Workpiece: Heat treated X155CrVMo12-1* (HRC55)
- Cutting conditions: vc(m/min) = 40
  fz(mm/t) = 0.1
  ap(mm) = 2
  ae(mm) = 10, Wet
- Tools: Insert APMT1604PDSR-MM (PC2510)
  Holder AMS3050HS



75% larger cutting volume compared to the competitor

PC2510 Performance (Alpha Mill)

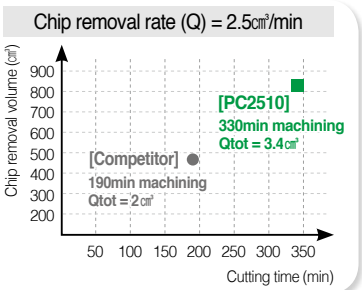


[PC2510]



[Competitor]

- Workpiece: 40CrMnNiMo8-6-4 (HRC34)
- Cutting conditions: vc(m/min) = 200
  fz(mm/t) = 0.1
  ap(mm) = 2
  ae(mm) = 10, Wet
- Tools: Insert APMT1604PDSR-MM (PC2510)
  Holder AMS3050HS



70% larger cutting volume compared to the competitor

* Germany [DIN]

Application Examples



[PC2505]

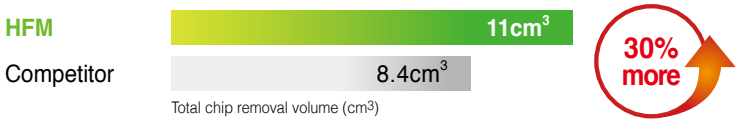


[Competitor]

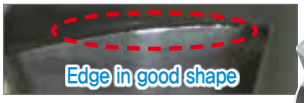
- Chip removal rate Q (cm³/min) : 1.4
- Cutting time (min) : 7.85

Alloy tool steel [X155CrVMo12-1(DIN) / D2(AISI) / STD11(KS), HRC60]

- Workpiece: Mold
- Cuttingconditions: vc(m/min) = 75, fz(mm/t) = 0.4, ap(mm) = 0.15, ae(mm) = 5, dry
- Tools: Insert LPMW040210R (PC2505) Holder HFMS1010HR-2S10



Higher wear resistance than the competitor by applying the corresponding high hardness grade and geometry



[PC2510]

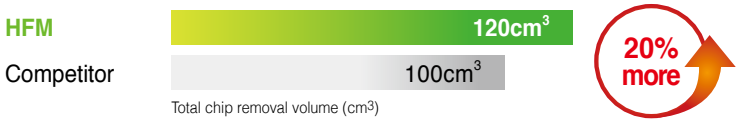


[Competitor]

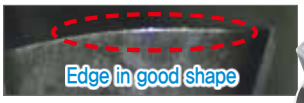
- Chip removal rate Q (cm³/min) : 4.8
- Cutting time (min) : 25

Alloy tool steel [X155CrVMo12-1(DIN) / D2(AISI) / STD11(KS), HRC40~45]

- Workpiece: Mold
- Cuttingconditions: vc(m/min) = 80, fz(mm/t) = 0.5, ap(mm) = 0.3, ae(mm) = 10, dry
- Tools: Insert LPMW040210R (PC2510) Holder HFMS1016HR-4S16



Higher impact resistance than the competitor by applying the corresponding high hardness grade and geometry



[PC2510]

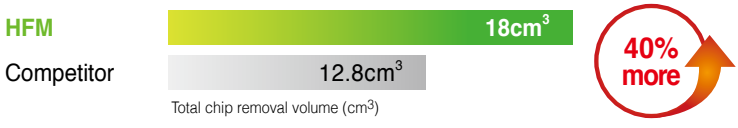


[Competitor]

- Chip removal rate Q (cm³/min) : 14.3
- Cutting time (min) : 1.26

Pre hardened steel [X30Cr13(DIN) / 420(AISI) / STAVAX(KS), HRC50~51]

- Workpiece: Mold
- Cuttingconditions: vc(m/min) = 200, fz(mm/t) = 0.6, ap(mm) = 0.3, ae(mm) = 10, dry
- Tools: Insert LPMT040210R-MF (PC2510) Holder HFMS1016HR-4S16

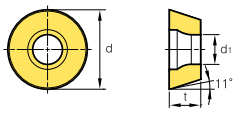
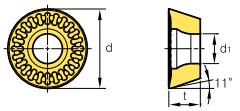
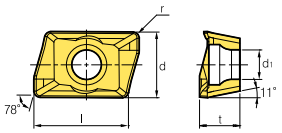
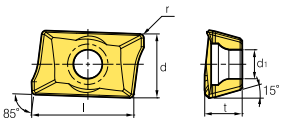
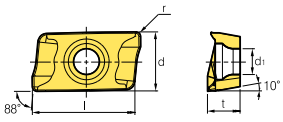
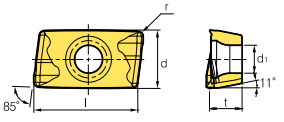
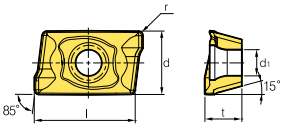
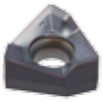
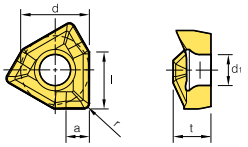
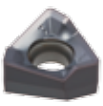
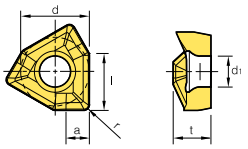
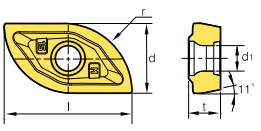


Higher wear resistance than the competitor by applying the corresponding high hardness grade



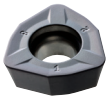
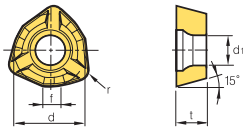
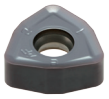
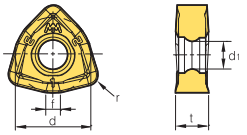
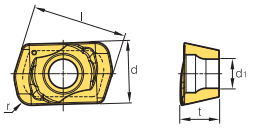
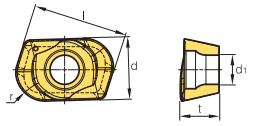
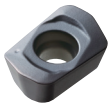
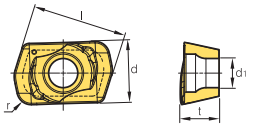
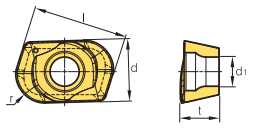
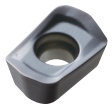
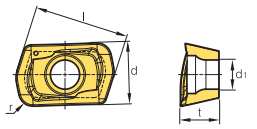
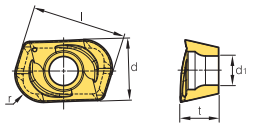
Available Stock

(mm)

Type	Designation			PC2505	PC2510	Dimensions (mm) l	d	t	r	d_1	a	f	Configuration
FMR		RPMW	0803M0E1	●	●	-	8	3.18	-	3.4	-	-	
			10T3M0E1	●	●	-	10	3.97	-	4.0	-	-	
			1204M0S1	●	●	-	12	4.76	-	4.5	-	-	
			1606M0S1	●	●	-	16	6.35	-	5.5	-	-	
			2007M0S1	●	●	-	20	7.00	-	7.0	-	-	
		RPMT	0803M0S-MM	●	●	-	8	3.18	-	3.4	-	-	
			10T3M0S-MM	●	●	-	10	3.97	-	4.0	-	-	
			1204M0S-MM	●	●	-	12	4.76	-	4.5	-	-	
			1606M0S-MM	●	●	-	16	6.35	-	5.5	-	-	
			2007M0S-MM	●	●	-	20	7.00	-	7.0	-	-	
Alpha Mill		APMT	0602PDSR-MM	●	●	6	4.24	2.6	0.2	2.0	-	-	
			0903PDSR-MM	●	●	9.4	6.21	3.6	0.4	2.8	-	-	
			11T3PDSR-MM	●	●	11.2	6.467	3.6	0.5	2.85	-	-	
			1604PDSR-MM	●	●	16.4	9.41	5.76	0.8	4.5	-	-	
			1806PDSR-MM	●	●	17.4	10.98	6.35	0.8	4.5	-	-	
RM3		XNKT	060405PNER-ML		●	5.7	6.5	4.0	0.5	3.4	1.8	-	
			080508PNER-ML		●	8.2	10.0	5.5	0.8	4.5	2.9	-	
		XNKT	060405PNSR-MM	●	●	5.7	6.5	4.0	0.5	3.4	1.8		
			080508PNSR-MM	●	●	8.2	10.0	5.5	0.8	4.5	2.9	-	
GBE	 Central	ZPET	100M-MM		●	19	10.4	4.5	10	3.4	-	-	
			125M-MM		●	24	12.9	5.3	12.5	4.5	-	-	
			160M-MM		●	28.5	16.4	7	16	5.6	-	-	
	 Peripheral	ZPET	100S-MM		●	15.5	8.4	3.8	10	3.4	-	-	
			125S-MM		●	20.5	10.7	4.5	12.5	4.5	-	-	
			160S-MM		●	26	13.4	6.5	16	5.6	-	-	

Available Stock

(mm)

Type	Designation			PC2505	PC2510	Dimensions (mm) l	d	t	r	d_1	a	f	Configuration
HRM		WDKT	080316ZDSR-MH	●	●	-	8	3.18	1.6	3.3	-	1.8	
			10T320ZDSR-MH	●	●	-	10.0	3.97	2.0	4.3	-	2.3	
			130520ZDSR-MH	●	●	-	13.5	5.56	2.0	5.56	-	3.1	
HRMD		WNMX	060312ZNN-MM	●	●	-	6.35	3.18	1.2	2.86	-	1.2	
			09T316ZNN-MM	●	●	-	9.525	3.97	1.6	3.6	-	1.7	
			130520ZNN-MM	●	●	-	12.7	5.56	2.0	4.7	-	2.5	
HFM		LPEW	040210R	●	●	6.4	4.2	2.6	1.0	2.0	-	-	
			040220R	●	●	6.4	4.2	2.6	2.0	2.0	-	-	
		LPMW	040210R	●	●	6.4	4.2	2.6	1.0	2.0	-	-	
			040220R	●	●	6.4	4.2	2.6	2.0	2.0	-	-	
		LPMT	040210R-MF		●	6.4	4.2	2.6	1.0	2.0	-	-	
			040220R-MF		●	6.4	4.2	2.6	2.0	2.0	-	-	

※ Managed items are constantly expanded at the moment.

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