

# 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  $\geq$  HRC45)

PC2510 (for high hardened / pre-hardened steel  $\leq$  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



## Roughing Grade Series for High Hardened Steels for High Hardened Steel, Tool Steel and Pre-Hardened Steel



### PC2505

For high hardened steel  
( $\geq$  H<sub>R</sub>C45)



### PC2510

For high hardened steel  
and pre-hardened steel  
( $\geq$  H<sub>R</sub>C35~50)

Machining workpieces with high hardness over H<sub>R</sub>C40 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.

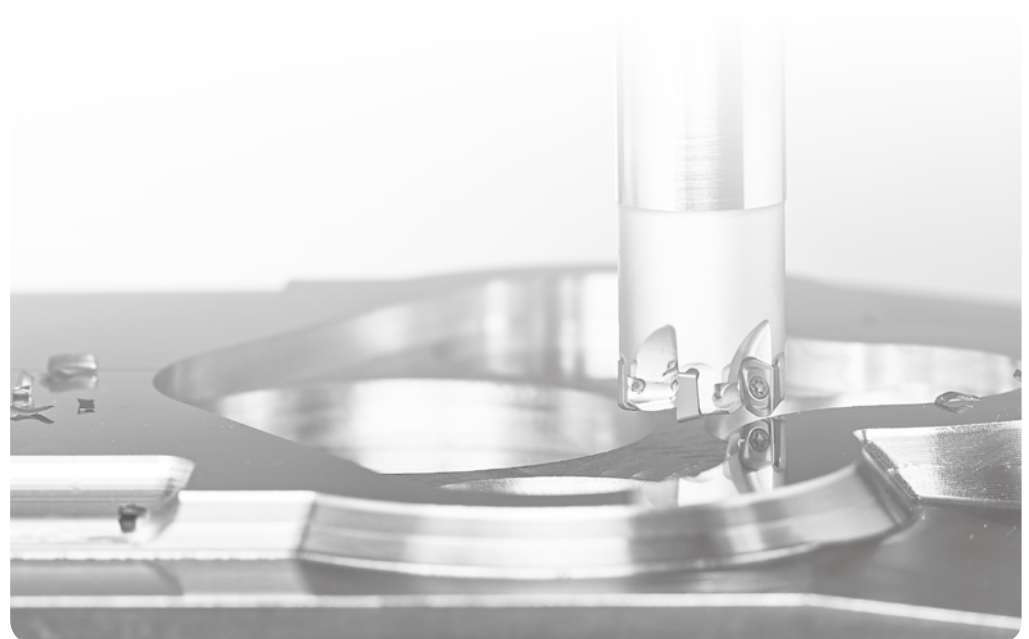
KORLOY provides an advanced milling solution for machining those high hardened steels.

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 H<sub>R</sub>C45.

**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.

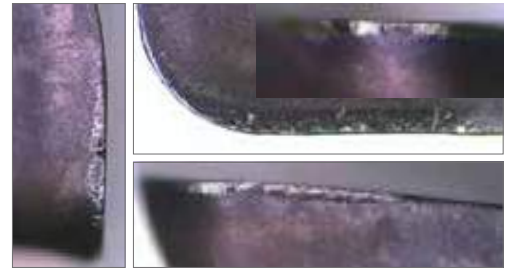


## ⇒ Common Problems when Machining High Hardened Steels

### 1. Chipping on cutting edges

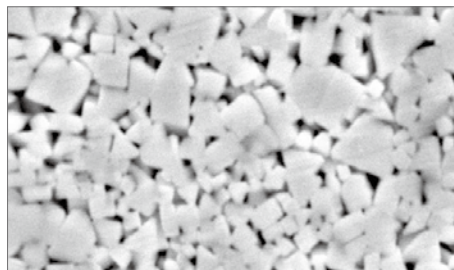


### 2. Rapid edge wear

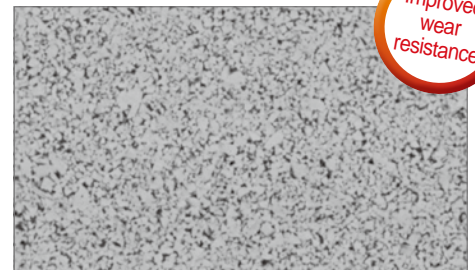


## ⇒ Development of the PC2500 Series

### Ultra fine substrate with high toughness



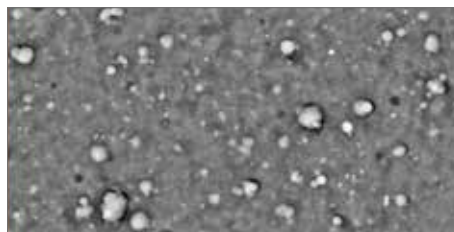
[ Fine grade ]



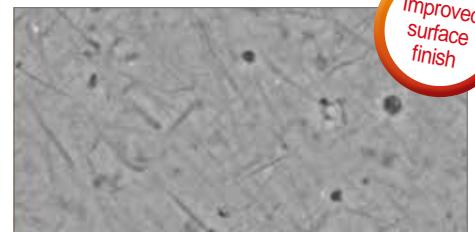
[ Ultrafine grade ]

Improved wear resistance

### Surface Treatment



[ Normal coating ]



[ After surface treatment ]

Improved surface finish



[ Normal insert ]



[ New insert after surface treatment ]

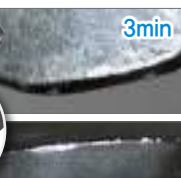
## ⇒ Development Effect

### 1. Increased wear resistance

- Workpiece Heat treated SKD11 (HRC45)
- 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 ]



3min



0.4min

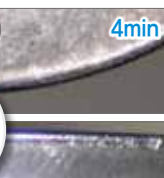
[ Competitor-H05 ]

### 2. Increased chipping resistance

- Workpiece Heat treated SKD11 (HRC60)
- 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 ]



4min



4min

[ Competitor-H10 ]

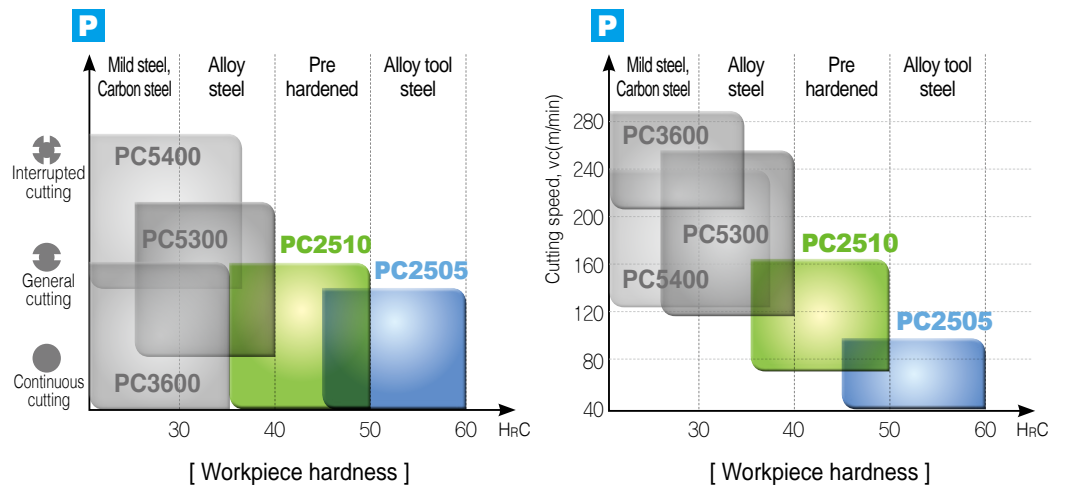
## ➔ Main Applied Products

• 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.



## ➔ Application Guideline by Workpiece Type

### Recommended grades for steel workpieces and their cutting conditions



## ➔ 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 ]

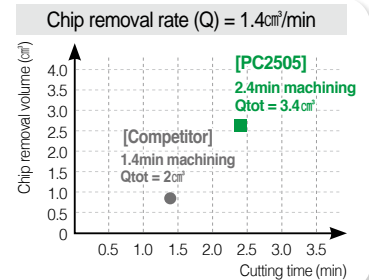


[ Competitor ]



### PC2505 Performance (HFM)

- 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 ]

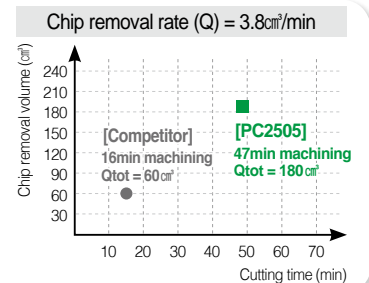


[ Competitor ]



### PC2505 Performance (Alpha Mill)

- 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 ]

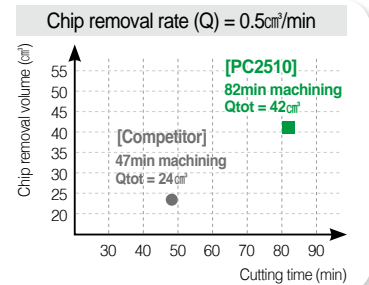


[ Competitor ]



### PC2510 Performance (Alpha Mill)

- 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 ]

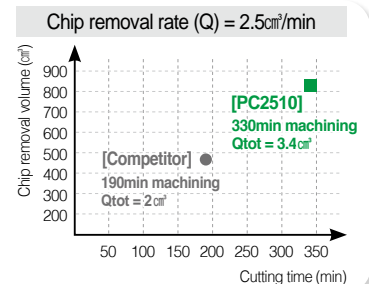


[ Competitor ]



### PC2510 Performance (Alpha Mill)

- 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



[ Competitor ]

- Chip removal rate Q (cm<sup>3</sup>/min) : 1.4
- Cutting time (min) : 7.85

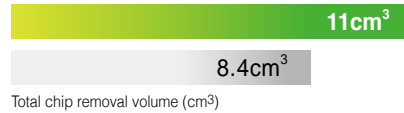


### Alloy tool steel [ X155CrVMo12-1(DIN) / D2(AISI) / STD11(KS), H<sub>R</sub>C60 ]

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

HFM

Competitor



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



[ Competitor ]

- Chip removal rate Q (cm<sup>3</sup>/min) : 4.8
- Cutting time (min) : 25

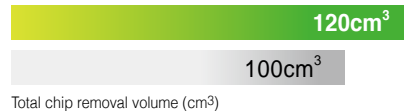


### Alloy tool steel [ X155CrVMo12-1(DIN) / D2(AISI) / STD11(KS), H<sub>R</sub>C40~45 ]

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

HFM

Competitor



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



[ Competitor ]

- Chip removal rate Q (cm<sup>3</sup>/min) : 14.3
- Cutting time (min) : 1.26

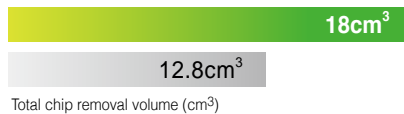


### Pre hardened steel [ X30Cr13(DIN) / 420(AISI) / STAVAX(KS), H<sub>R</sub>C50~51 ]

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

HFM

Competitor


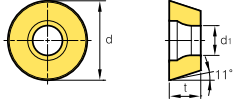


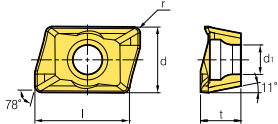
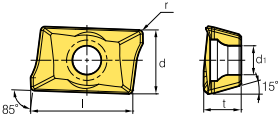
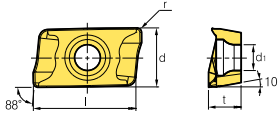
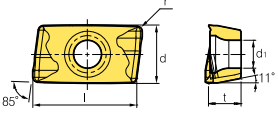
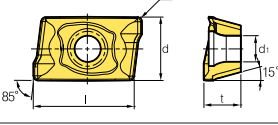

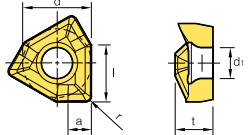


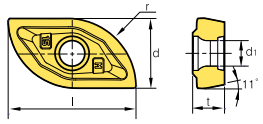



➔ Higher wear resistance than the competitor by applying the corresponding high hardness grade




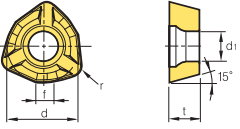

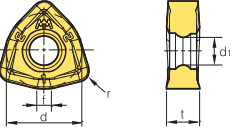

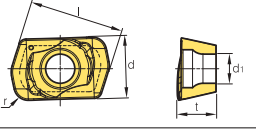
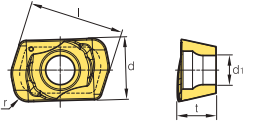
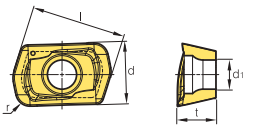
## Available Stock

(mm)

Type	Designation		Dimensions (mm)									Configuration				
			PC2505	PC2510	l	d	t	r	d <sub>1</sub>	a	f					
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		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	-	-				
		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		Dimensions (mm)									Configuration	
			PC2505	PC2510	l	d	t	r	d <sub>1</sub>	a	f		
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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