

PC2005 / PC2010 / PC2015 Insert Series for Finishing High Hardness Steel



Laser Mill Series

New Laser Mill series for high hardness steel and for universal purpose covering all die steel

PC2005 / PC2010 / PC2015

Outstanding increase of wear resistance through optimized grade per workpiece

KF / KH Chip Breaker

Increased strength and design of cutting edges through optimized blade geometries per workpiece





Insert Series for Finishing High Hardness Steel



PC2005

For high hardness steel and press die steel



PC2010 For pre hardened steel and plastic die steel



PC2015

For carbon steel and cast iron

Laser Mill Line-up optimized for machining die and mold die and mold using material such as high hardness steel, tool steel, pre hardened steel, etc.

PC2005 Tool steel or high hardness steel after heat treatment has very high hardness that causes severe wear on relief surface of cutting edges during cutting actions, as well as chipping due to heavy cutting loads. In order to prevent these problems, we progressively improved wear resistance and chipping resistance of the substrate by applying ultra fine raw materials to PC2005.

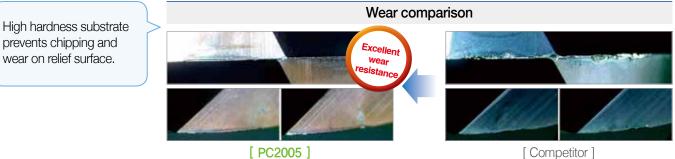
PC2010 In cutting conditions when cutting fluid is applied, thermal cracks occur on tool's surface due to repetitive thermal impact. To avoid thermal cracks, we applied a heat shield coating to PC2010. In addition, it was optimized for wet machining of pre hardened steel by using ultra fine raw materials and high binder on substrate and thus increasing stability.

PC2015 When machining carbon steel and mild steel, wear that looks like bites on tool's relief surface is caused by viscosity between tools and workpieces. PC2015 guarantees excellent tool life and machining stability with its characteristics of the high toughness substrate and the welding resistant coating with low reactivity to workpieces.



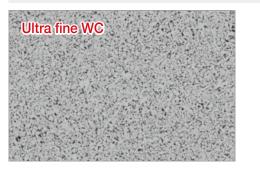
PC2005 (For high hardness workpiece and press die steel)

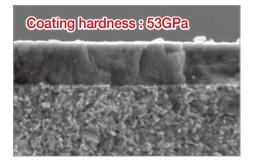
Super high hardness substrate and coating improve wear resistance dramatically.



[Competitor]

Super high hardness substrate and coating

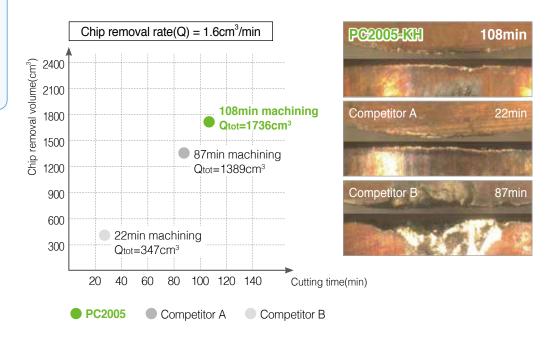


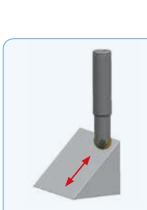


➔ Performance Test

PC2005 tool life test

- Workpiece High hardness heat-treated steel [X100CrMoV5 1(DIN), heat-treated HRC60)]
 - Cutting conditions vc(m/min) = 140, fz(mm/t) = 0.15, ap(mm) = 1.2, ae(mm) = 1.2, dry
- Insert LBH120-KH (PC2005) Tools





prevents chipping and

wear on relief surface.

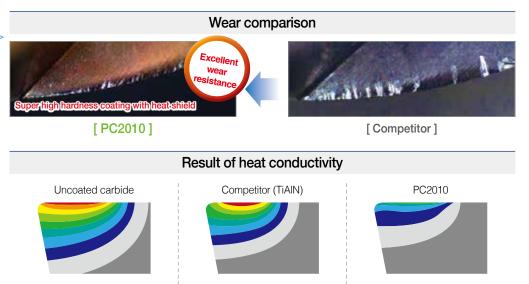
[Machining type]

Insert Series for Finishing High Hardness Steel

PC2010 (For pre hardened steel and plastic die steel)

Ultra fine WC and high contents cobalt were applied to the substrate to expand application range to high hardness steel and pre hardened steel.

Ρ



250

Temperature (°C)

2.1h

18.4h

- Heat shield coating was applied to prevent thermal crack.
- Ultra fine WC was combined with high contents cobalt to be optimized for machining pre hardened steel.



36

50

70

85

101

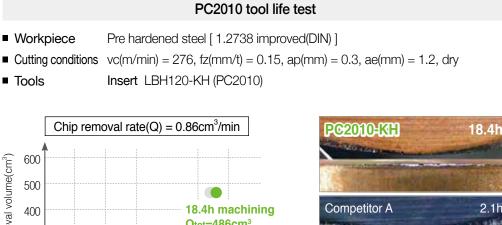
117

133

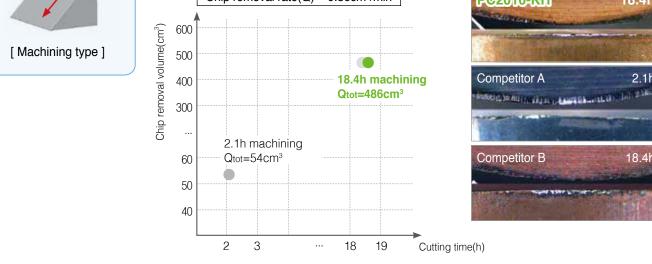
150

186

20

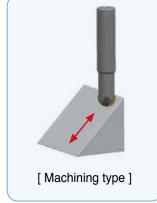


Competitor B



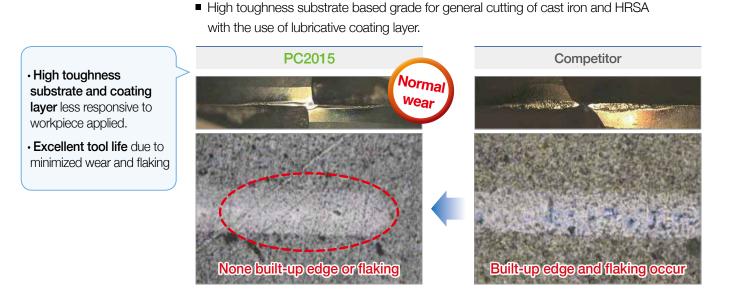
Competitor A

PC2010



PC2015 (Exclusive for Laser Mill for machining cast iron and carbon steel)

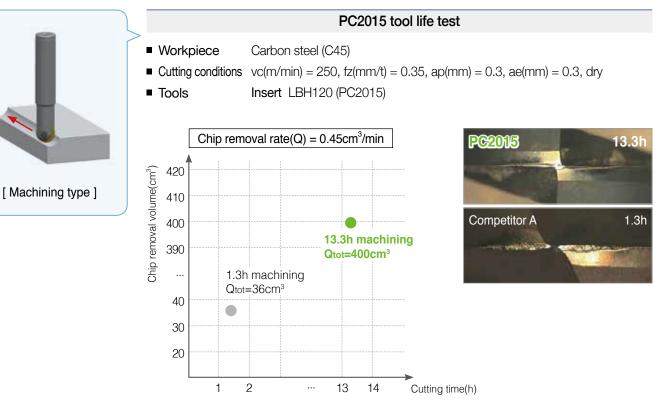
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➔ Performance Test

PC2015

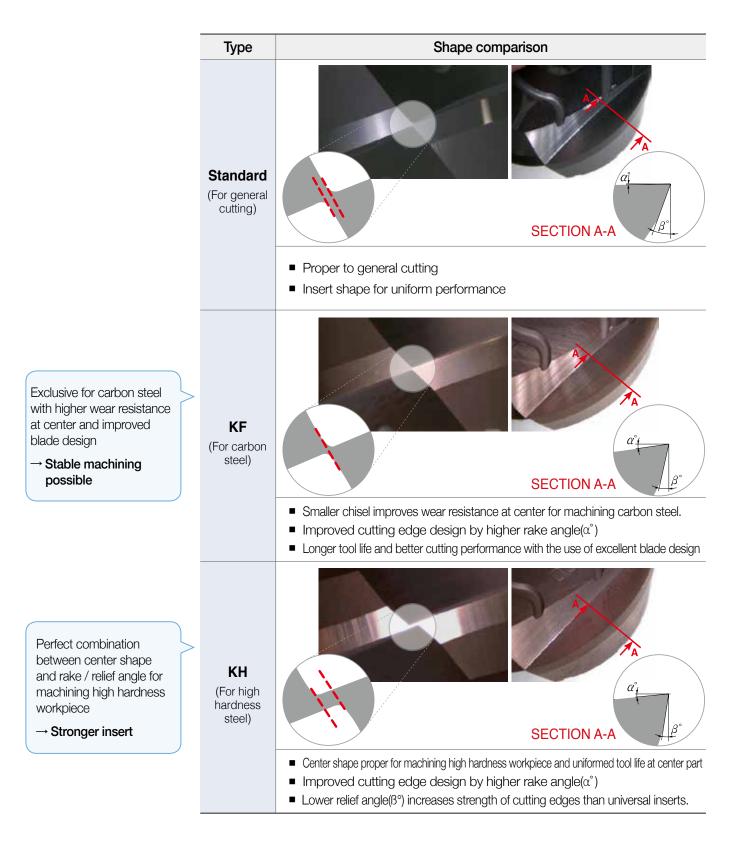
Competitor A



05 KORLOY TECH-NEWS

➔ Features of KF / KH Chip Breaker

- KF : Exclusive chip breaker for stable machining of carbon steel with its characteristics of high wear resistance at center part and improved blade design.
- KH : Stronger insert with the combination of rake angle and relief angle that are ideal for machining high hardness workpiece.



50th Anniversary Past 50 years of challenge, Next 50 years of creativity.

Insert Series for Finishing High Hardness Steel

➔ Application Guideline per Workpiece

• PC2005-KH :

Ideal for machining heattreated steel and high hardness steel with its characteristics of excellent wear resistance and the harmony between improved blade design and strong chip breaker.

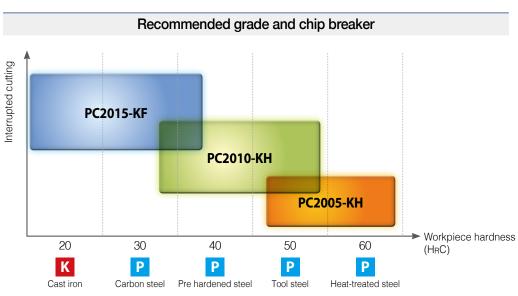
• PC2010-KH :

Ideal for machining **pre hardened steel** with its characteristics of the harmony between excellent thermal shock resistance and strong cutting edges.

• PC2015-KF :

Ideal for machining carbon steel with its characteristics of the harmony between excellent welding resistance and strong cutting edges/chip breakers.

When the overhang is over 3D, adjust the feed and reduce cutting speed as shown in the following table



→ Recommended Cutting Conditions

Workpiece				Grada	Chip	Recommended cutting conditions				
ISO		Material	HB(HRC)	Grade	breaker	vc(m/min)	fz(mm/t)	ap(mm)	ae(mm)	
к	Gray cast iron	GC250	180(8)	PC2015	KF	130~210	0.2~0.5	0.07D	0.07D	
	Ductile cast iron	GCD600	250(24)	PC2010 PC2005						
	Carbon steel	S20C~S50C	150	PC2005		170~250	0.2~0.5	0.07D	0.07D	
P	Alloy steel	SCM21~SCM5H	270(28)		КН	130~210	0.1~0.3	0.7D	0.7D	
	Pre hardened steel	KP4M	300(32)	PC2010 PC2015 PC210F		100~160	0.1~0.3	0.5D	0.5D	
		NIMAX	370(40)							
		CENA1	370(40)							
		NAK80	400(43)							
		STAVAX	510(52)							
	High speed tool steel	SKH51 ~ SKH59	550(55)	PC2005	КН	80~130	0.1~0.2	0.3D	0.3D	
	Alloy tool steel	STD61 (Hot forged) STD11 (Cold forged)	630(60)	PC2010		70~120	0.1~0.2	0.3D	0.3D	

Overhang		vc(m/min)	fz(mm/t)			
•						
	Under 3D	100%	100%			
	3D ~ 5D	70%	70%			
	5D ~ 8D	60%	60%			
	8D ~ 10D	50%	50%			

07 KORLOY TECH-NEWS

Insert Series for Finishing High Hardness Steel

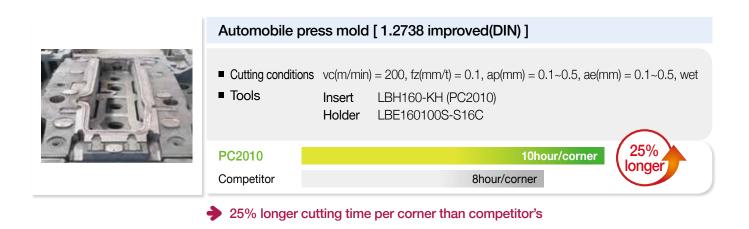
➔ Application Example

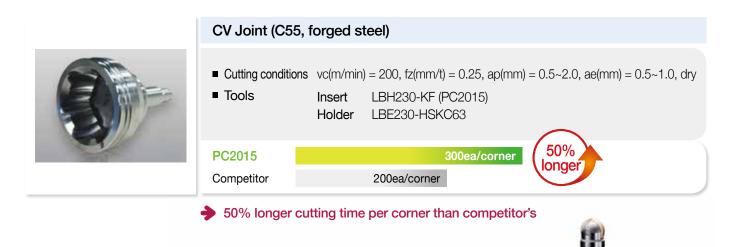


 Cutting conditions 	vc(m/min) = 377, fz(mm/t) = 0.5, ap(mm) = 0	0.5, ae(mm) = 0.2, dry
■ Tools	Insert Holder	LBH250-KH (PC2005) LBE250140S-S25C	\frown
PC2005		6.5hour/corner	
Competitor		5hour/corner	longer

Automobile press mold [X100CrMoV5 1(DIN), hot forged steel]

30% longer cutting time per corner than competitor's





→ Insert

Chara	Designation		Stock		Dimension(mm)			- Fig.		
Shape			PC2005	PC2010	PC2015	I	d	t	r	гıg.
	LBH	080-KF	-	-	-	7.0	8	2.4	4	. <u>r</u>
		090-KF	-	-	-	7.5	9	2.4	4.5	
		100-KF	-	-	•	8.5	10	2.6	5	
		110-KF	-	-	-	9.0	11	2.6	5.5	
		120-KF	-	-	•	10.0	12	3.0	6	
		130-KF	-	-	•	10.5	13	3.0	6.5	
		160-KF	-	-	•	12.0	16	4.0	8	
		170-KF	-	-	•	12.5	17	4.0	8.5	
		200-KF	-	-	•	15.0	20	5.0	10	
		210-KF	-	-	•	15.5	21	5.0	10.5	
		250-KF	-	-	•	18.5	25	6.0	12.5	
		260-KF	-	-	-	19.0	26	6.0	13	
		300-KF	-	-	•	22.5	30	7.0	15	
		310-KF	-	-	-	23.0	31	7.0	15.5	
		320-KF	-	-	-	23.5	32	7.0	16	
	LBH	080-KH	-	•	-	7.0	8	8	4	
		090-KH	-	-	-	7.5	9	9	4.5	<u>r</u>
		100-KH	•	•	-	8.5	10	10	5	
		110-KH	-	-	-	9.0	11	11	5.5	
		120-KH	•	•	-	10.0	12	12	6	
		130-KH	-	•	-	10.5	13	13	6.5	-
		160-KH	•	•	-	12.0	16	16	8	
		170-KH	•	•	-	12.5	17	17	8.5	
		200-KH	•	•	-	15.0	20	20	10	
		210-KH	-	•	-	15.5	21	21	10.5	
		250-KH	•	•	-	18.5	25	25	12.5	
		260-KH	-	•	-	19.0	26	26	13	
		300-КН	•	•	-	22.5	30	30	15	
		310-КН	-	-	-	23.0	31	31	15.5	
		320-KH	-	•	-	23.5	32	32	16	



Head Office

Holystar B/D, 1350, Nambusunhwan-ro, Geumcheon-gu, Seoul, 08536, Korea Tel : +82-2-522-3181 Fax : +82-2-522-3184 Web : www. korloy.com E-mail : export@korloy.com

Cheongju Factory

55, Sandan-ro, Heungdeok-gu, Cheongju-si, Chungcheongbuk-do, 28589, Korea Tel : +82-43-262-0141 Fax : +82-43-262-0146

Jincheon Factory

54, Gwanghyewonsandan 2-gil, Gwanghyewon-myeon, Jincheon-gun, Chungcheongbuk-do, 27807, Korea Tel : +82-43-535-0141 Fax : +82-43-535-0144

R & D Institute Cheongju

55, Sandan-ro, Heungdeok-gu, Cheongju-si, Chungcheongbuk-do, 28589, Korea Tel : +82-43-262-0141 Fax : +82-43-262-0711

R & D Institute Seoul

Holystar B/D, 1350, Nambusunhwan-ro, Geumcheon-gu, Seoul, 08536, Korea Tel : +82-2-522-3181 Fax : +82-2-522-3184

(A) KORLOY AMERICA

620 Maple Avenue, Torrance, CA 90503, USA Tel : +1-310-782-3800 Toll Free : +1-888-711-0001 Fax : +1-310-782-3885 www.korloyamerica.com E-mail : sales@korloy.us

& KORLOY EUROPE

 Gablonzer Str. 25-27, 61440 Oberursel, Germany

 Tel : +49-6171-277-83-0
 Fax : +49-6171-22

 www.korloyeurope.com
 E-mail : sales@k

erursel, Germany Fax : +49-6171-277-83-59 E-mail : sales@korloyeurope.com

💩 KORLOY INDIA

 Plot NO.415, Sector 8, IMT Manesar, Gurgaon 122051, Haryana, INDIA

 Tel: +91-124-4391790
 Fax: +91-124-4050032

 www.korloyindia.com
 E-mail : sales.kip@korloy.com

🙆 KORLOY BRASIL

Av. Aruana 280, conj.12, WLC, Alphaville, Barueri, CEP06460-010, SP, Brasil Tel : +55-11-4193-3810 E-mail : vendas@korloy.com

& KORLOY FACTORY QINGDAO

Ground Dongjing Road 56 District Free Trade Zone. Qingdao, China Tel : +86-532-86959880 Fax : +86-532-86760651 E-mail : kycpjh@korloy.com



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