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2IC

ISO 9001 COMPANY
2 I C

DIAMOND TOOLS

with Chipbreaker

www.21t.co.kr

21CENTURY CO.,LTD

PCD(Polycrystalline Diamond) Cutting Tools

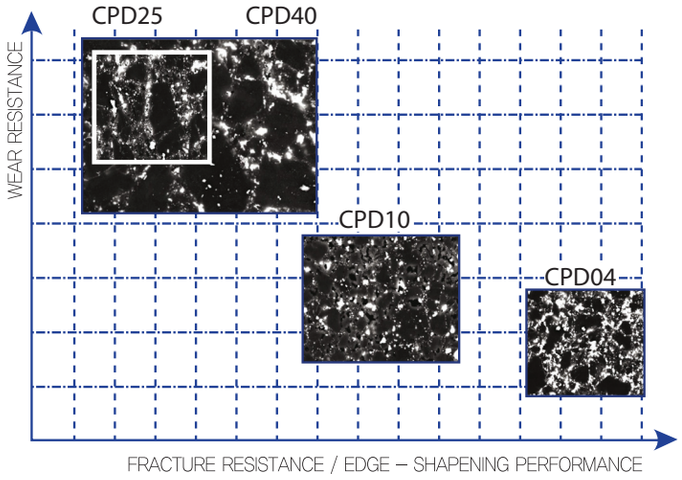
PCD cutting tools are used for machining a wide variety of non-ferrous materials.

Benefits

- Excellent wear resistance
- Good surface finishes
- Faster cycle times
- Increased productivity

Applications

- Non-ferrous materials: Al alloy, Copper, Tungsten Carbide etc
- Non-metallic Materials: Wood, Graphite, Plastic, Ceramics etc



Typical Working Parameters

Materials		Work	Cutting Speed(m/min)	Feed(mm/rev)	Depth(mm)	PCD Grade
Al alloys	Si 4~8%	T	900 - 2500	0.1 - 0.4	0.1 - 3.0	CPD10
		M	1000 - 4000	0.1 - 0.3	0.1 - 2.0	
	Si 9~14%	T	600 - 2400	0.1 - 0.4	0.1 - 4.0	CPD25
		M	700 - 3000	0.1 - 0.3	0.1 - 3.0	
	Si>14%	T	300 - 700	0.1 - 0.4	0.1 - 4.0	CPD40
		M	400 - 900	0.1 - 0.3	0.1 - 3.0	
Cu alloys		T	400 - 1260	0.03 - 0.3	0.05 - 2.0	CPD04
		M	400 - 1200	0.05 - 0.3	0.05 - 2.0	
Green Tungsten Carbide		T	30 - 100	0.1 - 0.4	0.1 - 1.0	CPD40
		M	100 - 200	0.1 - 0.4	0.1 - 1.0	
Ceramics		T	50 - 100	0.1 - 0.25	0.1 - 0.5	
Carbon-fiber Composite		T	300 - 1000	0.1 - 0.4	0.1 - 3.0	
Glass-fiber reinforced plastics		T	200 - 1000	0.05 - 0.5	0.1 - 3.0	CPD10
Wood		F	1000 - 3650	0.1 - 4.0	0.1 - 4.0	
		C	1500 - 4000	0.5 - 5.0	up to 10	

T: Turning M: Milling F: Forming C: Cutting

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PCD inserts with Chipbreakers

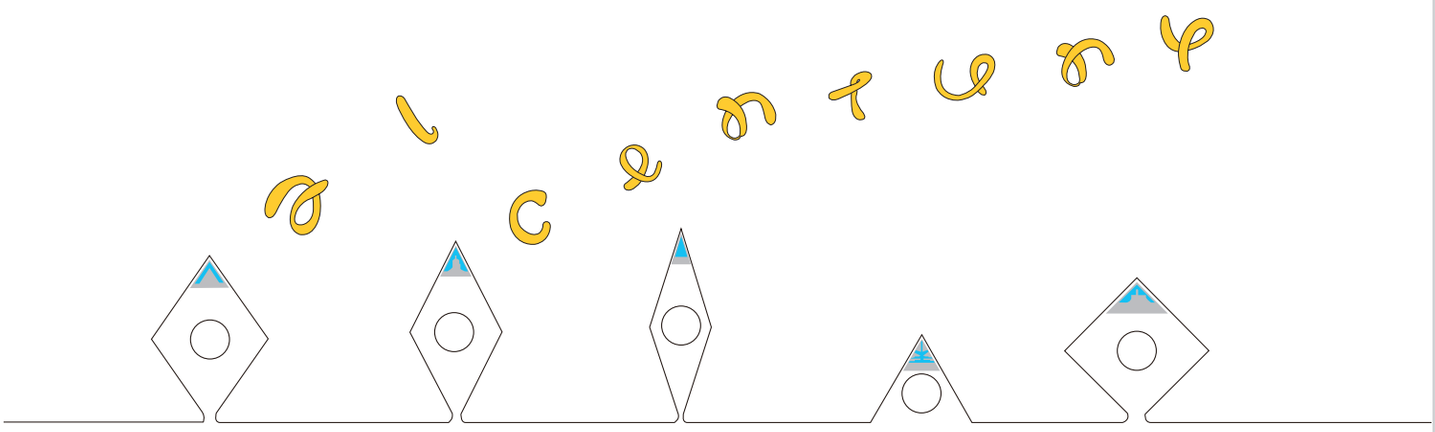
21CENTURY introduces revolutionary 3D PCD chipbreaking technology for the machining of non-ferrous materials.
Through the use of advanced proprietary technology, true 3D PCD chipbreaker forms are produced at the cutting point of the PCD segment.
The performance results of this dramatic innovation, which is available in roughing and finishing forms, are unsurpassed chip control and dramatically increased tool life.
The higher shear angles integrated with the chipbreaker produces lower cutting pressures and less heat expansion of the workpiece.
The by-product of this machining dynamic is precise dimensional accuracy, eliminating the need for secondary operation while both increasing productivity and reducing operating costs.

Benefits

- Reduced scrap
- Chips break easily
- High quality parts
- Tools last much longer
- Reduced machine downtimes
- Cost saving & economical effect
- Very fine surface roughness & less heat expansion & less deformation

21C Activities

Each laser-etched chip breaker is specially designed to meet the cutting requirements of the application. Inserts are available for both roughing and finishing operations in all ANSI and ISO styles including square, triangle and round.
21CENTURY also manufactures special drills, reamers, milling cutters and form tools with or without chipbreakers.



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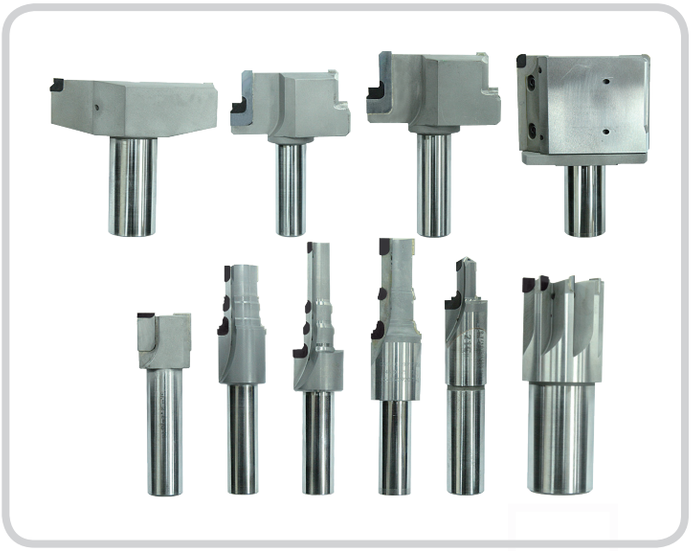
Rotary Tools

21CENTURY provides standard and custom manufactured PCD and PCBN rotary tools including, but not limited to Drills, End Mills, Ball Nose End Mills, Reamers, Step Drills, Counter-sinks, Counter-bore, Milling Cutters and coolant through tools.
We also provide relap, retip and reset service on any of our manufactured PCD tools.

- Reamers
- Coolant Thru Tools
- Endmills
- Form Tools
- Inserts
- Cartridges
- Step Drills
- Milling Cutters
- Fine Boring Bar



Special Tooling

21CENTURY will build PCD and PCBN tooling to your print requirements.
You may also work with our engineers to manufacture your concept tool design.

Contract Services

Because of our high volume capacity, engineering services, and specialized equipment, we can offer a variety of contract manufacturing services to cutting tool manufacturers and distributors:

- Insert Grinding & Honing
- Insert Fabrication
- K-Land Grinding
- Consignment Service
- Laser Marking

Without Chipbreaker

With Chipbreaker

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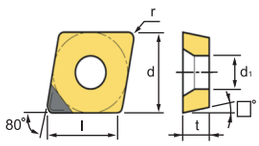
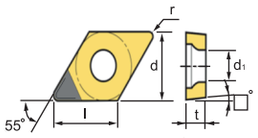
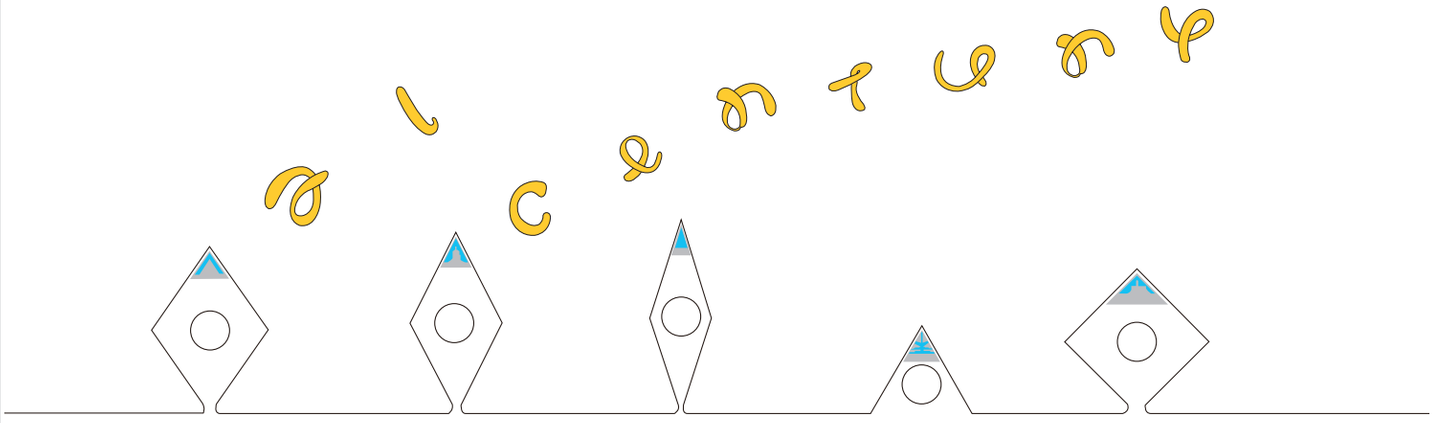
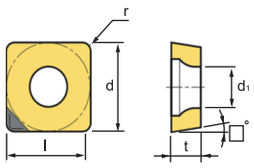
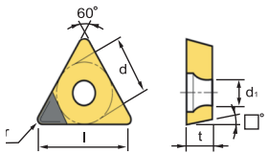
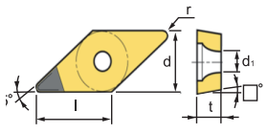
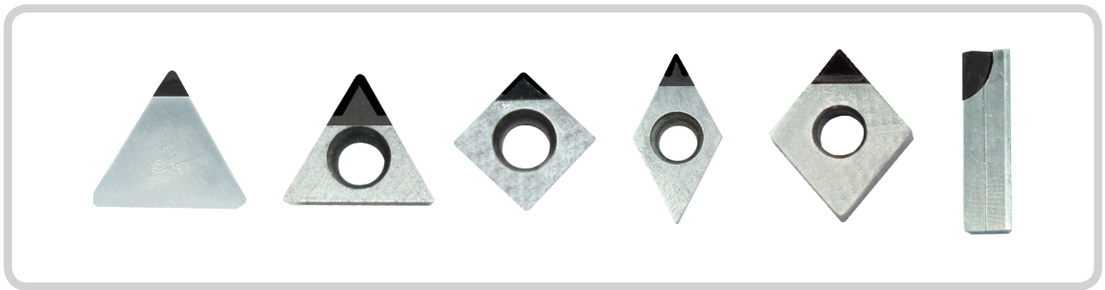
Standard PCD Inserts

Insert Shape	Designation		Dimension(mm)			Working		Chipbreaker	
			d ±0.02	t ±0.02	nose r	Rough	Finish	Yes	No
	CCGT	060202	6.35	2.38	0.2	●	●	●	●
		060204	6.35	2.38	0.4	●	●	●	●
		09T304	9.525	3.97	0.4	●	●	●	●
		09T308	9.525	3.97	0.8	●	●	●	●
		120404	12.70	4.76	0.4	●	●	●	●
		120408	12.70	4.76	0.8	●	●	●	●
	CPGT	060202	6.35	2.38	0.2	●	●	●	●
		060204	6.35	2.38	0.4	●	●	●	●
		090304	9.525	3.18	0.4	●	●	●	●
		090308	9.525	3.18	0.8	●	●	●	●
		120404	12.70	4.76	0.4	●	●	●	●
		120408	12.70	4.76	0.8	●	●	●	●
	CNGA	120404	12.70	4.76	0.4	●	●	●	●
		120408	12.70	4.76	0.8	●	●	●	●
		120412	12.70	4.76	1.2	●	●	●	●
	DCGT	070202	6.35	2.38	0.2	●	●	●	●
		070204	6.35	2.38	0.4	●	●	●	●
		11T302	9.525	3.97	0.2	●	●	●	●
		11T304	9.525	3.97	0.4	●	●	●	●
		11T308	9.525	3.97	0.8	●	●	●	●
	DNGA	150404	12.70	4.76	0.4	●	●	●	●
		150408	12.70	4.76	0.8	●	●	●	●
		150412	12.70	4.76	1.2	●	●	●	●
		150604	12.70	6.35	0.4	●	●	●	●
		150608	12.70	6.35	0.8	●	●	●	●
		150612	12.70	6.35	1.2	●	●	●	●



Insert Shape	Designation		Dimension(mm)			Working		Chipbreaker	
			d ±0.02	t ±0.02	nose r	Rough	Finish	Yes	No
	SCGT	09T304	9.525	3.97	0.4	●	●	●	●
		09T308	9.525	3.97	0.8	●	●	●	●
		120404	12.70	4.76	0.4	●	●	●	●
		120408	12.70	4.76	0.8	●	●	●	●
	SNGA	120404	12.70	4.76	0.4	●	●	●	●
		120408	12.70	4.76	0.8	●	●	●	●
	SPGT	060204	6.35	2.38	0.4	●	●	●	●
		090304	9.525	3.18	0.4	●	●	●	●
		120404	12.70	4.76	0.4	●	●	●	●
	TCGT	110202	6.35	2.38	0.2	●	●	●	●
		110204	6.35	2.38	0.4	●	●	●	●
	TNGT	160404	9.525	4.76	0.4	●	●	●	●
		160408	9.525	4.76	0.8	●	●	●	●
		160412	9.525	4.76	1.2	●	●	●	●
	TPGT	060204	3.97	2.38	0.4	●	●	●	●
		090302	5.56	3.18	0.2	●	●	●	●
		110304	6.35	3.18	0.4	●	●	●	●
		110308	6.35	3.18	0.8	●	●	●	●
	VBGT	160404	9.525	4.76	0.4	●	●	●	●
		160408	9.525	4.76	0.8	●	●	●	●
	VCGT	110302	6.35	3.18	0.2	●	●	●	●
		110304	6.35	3.18	0.4	●	●	●	●
		160404	9.525	4.76	0.4	●	●	●	●
		160408	9.525	4.76	0.8	●	●	●	●

• The any other types are available; If you need quotation, please inform us of your specification.



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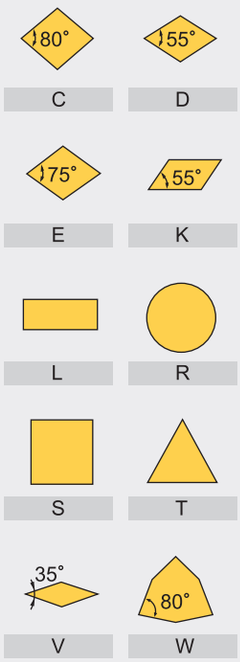
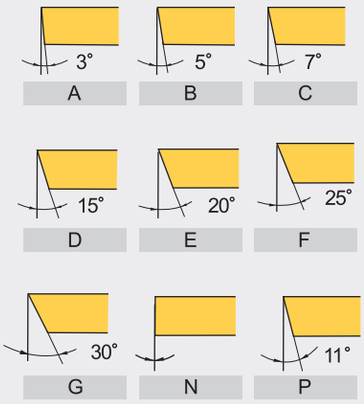
C	C	G	T	06
1	2	3	4	5

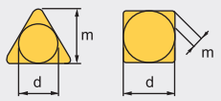
1 Shape



2 Relief Angle



3 Tolerance



d : Inscribed Circle
t : Thickness
m : refer to figure

(mm)

Class	d	m	t
A	±0.025	±0.005	±0.025
C	±0.025	±0.013	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.05~±0.15	±0.005	±0.025
K	±0.05~±0.15	±0.013	±0.025
L	±0.05~±0.15	±0.025	±0.025
M	±0.05~±0.15	±0.08~±0.20	±0.13
U	±0.08~±0.25	±0.13~±0.38	±0.13

■ Tolerance on C, E, R,S,T,W Insert Shape (exceptional case)

d	Tolerance on d		Tolerance on m	
	J,K,L,M,N	U	M,N	U
635	±0.05	±0.08	±0.08	±0.13
9.525	±0.05	±0.08	±0.08	±0.13
12.7	±0.08	±0.13	±0.13	±0.20
15.875	±0.10	±0.18	±0.15	±0.27
19.05	±0.10	±0.18	±0.15	±0.27
25.4	±0.13	±0.25	±0.18	±0.38

■ Tolerance on D Insert Shape (exceptional case)

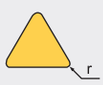
d	Tolerance on d	Tolerance on m
635	±0.05	±0.11
9.525	±0.05	±0.11
12.7	±0.08	±0.15
15.875	±0.10	±0.18
19.05	±0.10	±0.18

6 Height

Symbol		Height of cutting edge(t)	
Metric	Inch	mm	Inch
01	1(2)	1.59	1/16
T0	1.125	1.79	9/128
T1	1.2	1.98	5/64
02	1.5(3)	2.38	3/32
T2	1.75	2.78	7/64
03	2	3.18	1/8
T3	2.5	3.97	5/32
04	3	4.76	3/16
05	3.5	5.56	7/32
06	4	6.35	1/4
07	5	7.94	5/16
09	6	9.52	3/8
11	7	11.11	7/16
12	8(16)	12.70	1/2

( )Symbol for small size insert

7 Nose Radius



Symbol		Corner Radiue	
Metric	Inch	Metric	Inch
01	0	0.1	0.004
02	0.5	0.2	0.008
04	1	0.4	1/64
08	2	0.8	1/32
12	3	1.2	3/64
16	4	1.6	1/16
20	5	2.0	5/64
24	6	2.4	3/32
28	7	2.8	7/74
32	8	3.2	1/8
00	-	Round insert(Inch)	
M0	-	Round insert(Metric)	

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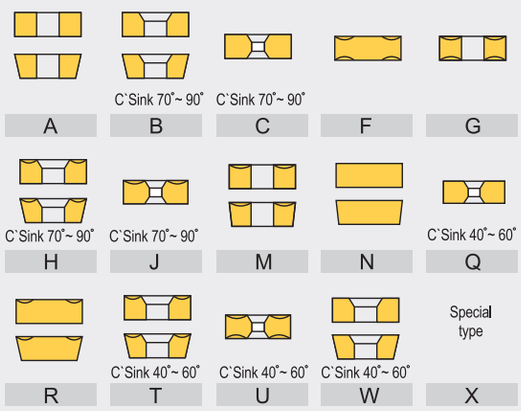
02	04	CB	R	CPD10
6	7	8	9	10

4 Type

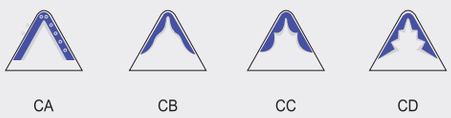


5 Cutting Edge Length

Symbol							Inch	IC
C	d	S	T	R	V	W		
Metric								d(mm)
03	04	03	06	03	-	02	1.2(5)	3.97
04	05	04	08	04	08	S3	1.5(6)	4.76
05	06	05	09	05	09	03	1.8(7)	5.56
-	-	-	-	06	-	-	-	6.00
06	07	06	11	06	11	04	2	6.35
08	09	07	13	07	13	05	2.5	7.94
-	-	-	-	08	-	-	-	8.00
09	11	09	16	09	16	06	3	9.525
-	-	-	-	10	-	-	-	10.00
11	13	11	19	11	19	07	3.5	11.11
-	-	-	-	12	-	-	-	12.00
12	15	12	22	12	22	08	4	12.70
14	17	14	24	14	24	09	4.5	14.29
16	19	15	27	15	27	10	5	15.875
-	-	-	-	16	-	-	-	16.00
17	21	17	30	17	30	11	5.5	17.46
19	23	19	33	19	33	13	6	19.05
-	-	-	-	20	-	-	-	20.00
22	27	22	38	22	38	15	7	22.225
-	-	-	-	25	-	-	-	25.00
25	31	25	44	25	44	17	8	25.40
32	38	31	54	31	54	21	10	31.75
-	-	-	-	32	-	-	-	32.00

( )Symbol for small size insert

8 Chipbreaker



※ Not exit chipbreaker: CN

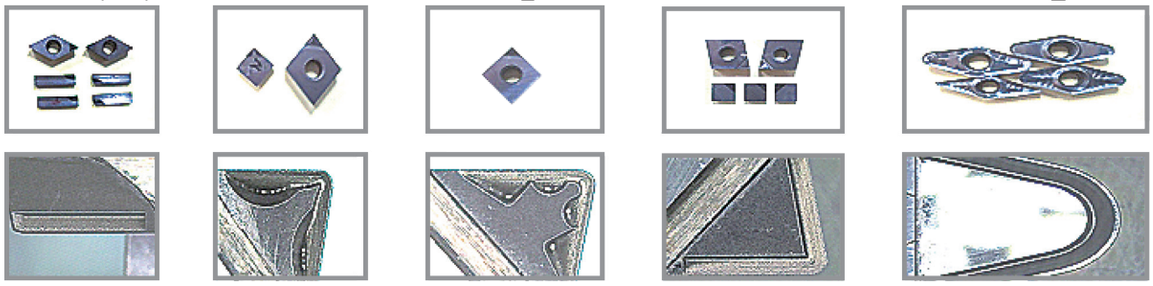
9 Cutting Process

R : Rough

F : Finish

10 PCD Grades

	Roughness	Wear Resistance
CPD04	Good	Poor
CPD10	|	|
CPD25		
CPD40	Poor	Good



Benefits through Chipbreakers

- ◈ No damage from long chip, and then increased tool life and fine surface
- ◈ Lower cutting power and lower cutting temperature , and then increased tool life and less deformation
- ◈ Very fine surface roughness & less heat expansion and deformation
- ◈ Much better for non-ferrous metal
- ◈ Cost saving and reduced cycle time and economic effect

Welcoming customized special specification of size, shape and grade!

MEMO

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International Industrial Certification

21 CENTURY CO., LTD.

#1-1, Galcheon-ri, Hyangnam-eup, Hwaseong-si, Gyeonggi-do, Korea

This is to certify that the Quality Management System of the above mentioned company meets the requirement of

ISO 9001 : 2008

Scope

Manufacture of Cutting Tool

EAC : 18 NACE : DK 29.42

Certificate number : JK-1731
Date of initial approval : 25 November 2004
Re-issued : 16 November 2010
Expiry : 29 November 2013

Approved by .....

This certificate is a property of IIC and valid only if regulatory surveillance audit is conducted within the required time.

International Industrial Certification Co., Ltd.
8F, Gayang Technotown, 1487, Gayang 3-Dong, Gangseo-Gu, Seoul, Korea
Tel : +82-2-6097-9001~4 Fax : +82-2-6097-9005

Accreditation by the Joint Accreditation System of Australia and New Zealand.
www.jas-anz.org/register

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KMAR

Certificate No : REM1500

Environmental Management System Certificate

This is to certify that
the environmental management system of

21 CENTURY CO.,LTD.

at

#1-1, Galcheon-ri, Hyangnam-eup, Hwaseong-si, Gyeonggi, Korea

has been found to conform to the Environmental Management System Standards:

KS I ISO 14001:2009 / ISO 14001:2004

This Certificate is valid for the following product or service ranges:

Manufacture of Cutting Tool

Issue Date
Oct. 4. 2010

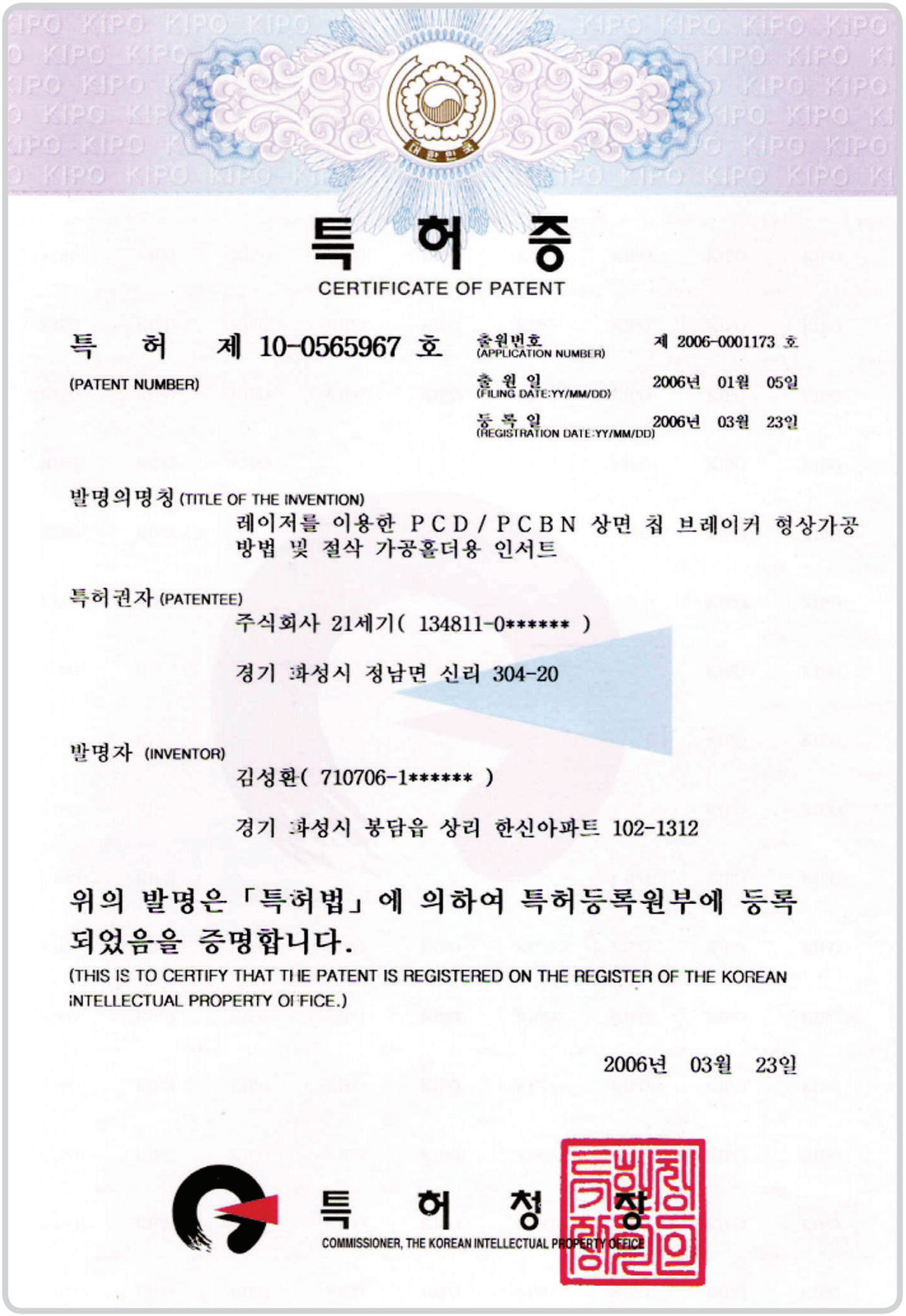
Certification Date : Jan. 18. 2010 Valid Date : Jan. 17. 2013

KMAR ISO14001 | IAF | KAB

Authorized By K H Park
Ki Ho Park, President

- Mark indicates that KMAR is accredited by the KAB (No. KAB-EC-17)
- Mark indicates that KMAR is accredited by the member of the International Accreditation Forum Multilateral Recognition Arrangement
- KSIC CODE :17/ Initial certification date: Jan. 18. 2010

KMAR/ 1dong, 12F, Ace High Tech City, #55-20, Mullae-dong, 3-ga, Yeongdeungpo-gu, Seoul, 150-972, Korea



특 허 증

CERTIFICATE OF PATENT

특 허 제 10-0565967 호
(PATENT NUMBER)

출원번호 (APPLICATION NUMBER) 제 2006-0001173 호

출 원 일 (FILING DATE:YY/MM/DD) 2006년 01월 05일

등 록 일 (REGISTRATION DATE:YY/MM/DD) 2006년 03월 23일

발명의명칭 (TITLE OF THE INVENTION)

레이저를 이용한 PCD/PCBN 상면 칩 브레이커 형상가공 방법 및 절삭 가공홀더용 인서트

특허권자 (PATENTEE)

주식회사 21세기(134811-0******)

경기 화성시 정남면 신리 304-20

발명자 (INVENTOR)

김성환(710706-1******)

경기 화성시 봉담읍 상리 한신아파트 102-1312

위의 발명은 「특허법」에 의하여 특허등록원부에 등록되었음을 증명합니다.

(THIS IS TO CERTIFY THAT THE PATENT IS REGISTERED ON THE REGISTER OF THE KOREAN INTELLECTUAL PROPERTY OFFICE.)

2006년 03월 23일

특 허 청 장
COMMISSIONER, THE KOREAN INTELLECTUAL PROPERTY OFFICE

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