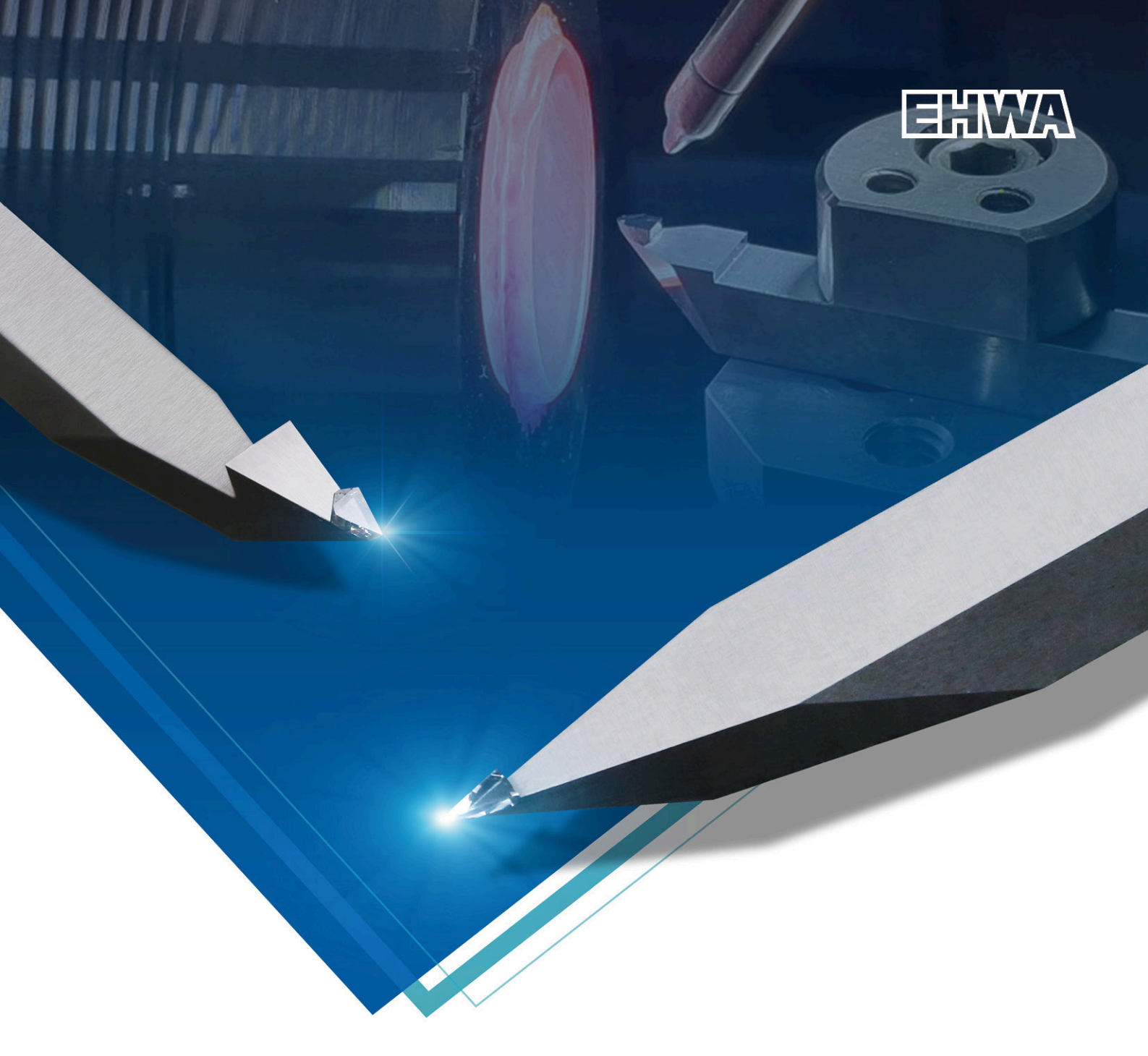




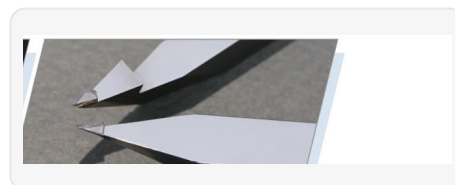
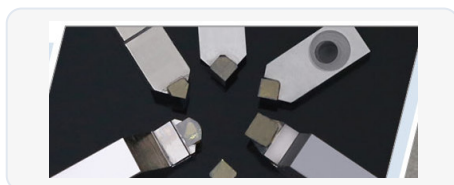
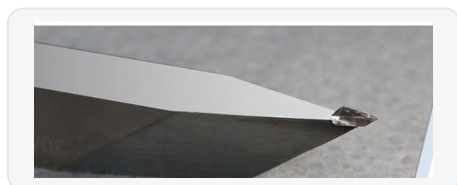
EHWA

EHWA DIAMOND · SCD / MCD

Single Crystalline Diamond Cutting Tools

A leading technology of super-precision machining

SCD



EHWA

EHWA DIAMOND · INNOVATOR IN TECHNOLOGY

SCD / MCD Tools

High Precision Cutting Tools with

Single Crystalline (Monocrystalline) Diamonds



Natural diamond



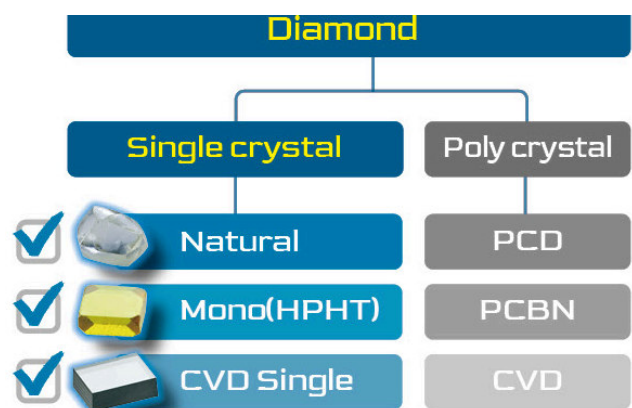
Mono diamond



CVD Single Crystal



MATERIAL CLASSIFICATION



EHWA produces SCD tools from all three single crystal types: Natural, Mono (HPHT) and CVD Single.

FEATURES

- High precision in cutting edge
- Chipping-free cutting edge
- Longer tool life than PCD and PCBN cutting tools
- Optimal design for every application
- Suitable for machining non-ferrous materials
- Consistent tool life & cutting ability
- Sharp cutting edge to enable burr-free machining

PRECISION TOOLING FOR

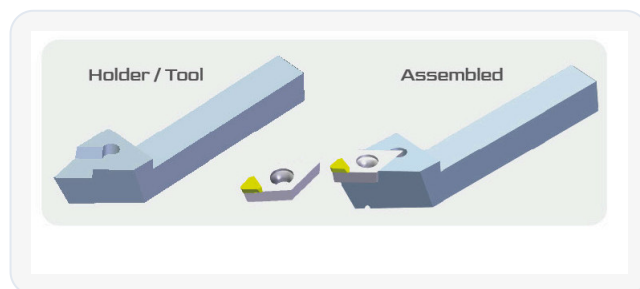
Medical Industry

Contact Lens

SCD tools are the best choice to achieve excellent surface roughness on both outer and inner surfaces of contact lens by mirror surface finishing process.



EHWA's contact lens machining tools are free from scratches and burrs on the contact lens that may occur during finishing process. Customers can save cost by EHWA's re-grinding (re-lapping) service and prompt action.

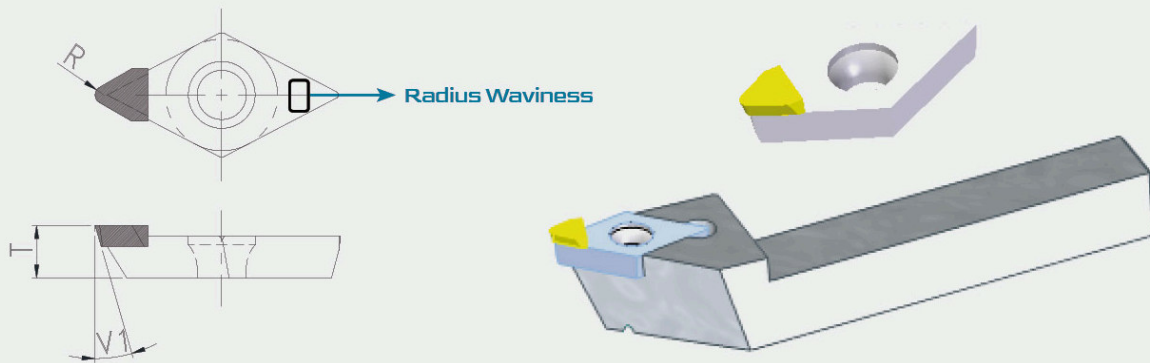


FEATURES

- Chipping-free at x1,000 microscope
- Consistent quality
- Longer tool life
- High vacuum brazed diamond tip

SPEC.	OPTION
Diamond	Natural, Synthetic
Tool Type	Insert type, Solid type
Waviness	Controlled, Non-controlled
Clearance Angle (1st)	Cylindrical, Conical

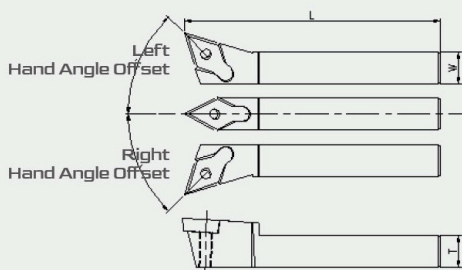
Contact Lens Tool



MATERIAL	INSERT TYPE	RADIUS	CLEARANCE ANGLE	CLEARANCE TYPE	CONTOUR (WAVINESS, MM)
EN : Natural	D : 55°	R025 : R0.25	CA10 : 10°	CO : Conical	Controlled
EM : Mono	DCGW0702	R03 : R0.3	CA12 : 12°	CY : Cylindrical	W005 : ≤0.05
(HPHT)	DCMW11T3	R05 : R0.5	CA15 : 15°		W01 : ≤0.1
EV : Mono (CVD)	V : 35°		CA16 : 16°		W02 : ≤0.2
	VCGW1103		CA18 : 18°		W03 : ≤0.3
					W05 : ≤0.5
					Non-controlled
Single Crystalline (110) 2pt diamond	Special	0.1~1.0 available for contact lens tool	CA01~20 available for contact lens tool	—	Depending on radius & clearance type

EX) EV-D-R03-CA15-CO-W03

MONO CVD, DCGW0702 INSERT, R0.3, Clearance Angle 15°, Conical Type, Waviness 0.3 μm

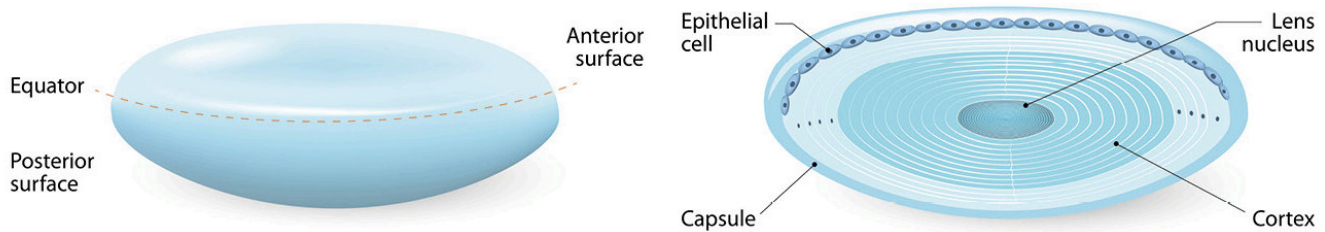


Holder System (Center / Right / Left)

- Available for both solid and insert type
- Available in adjusting body length and thickness
- Tungsten Carbide shank

IOL - Intraocular Lens

For years, EHWA has developed the cutting tools for IOL machining to meet various requirements.



EHWA's SCD tools for IOL machining provide:

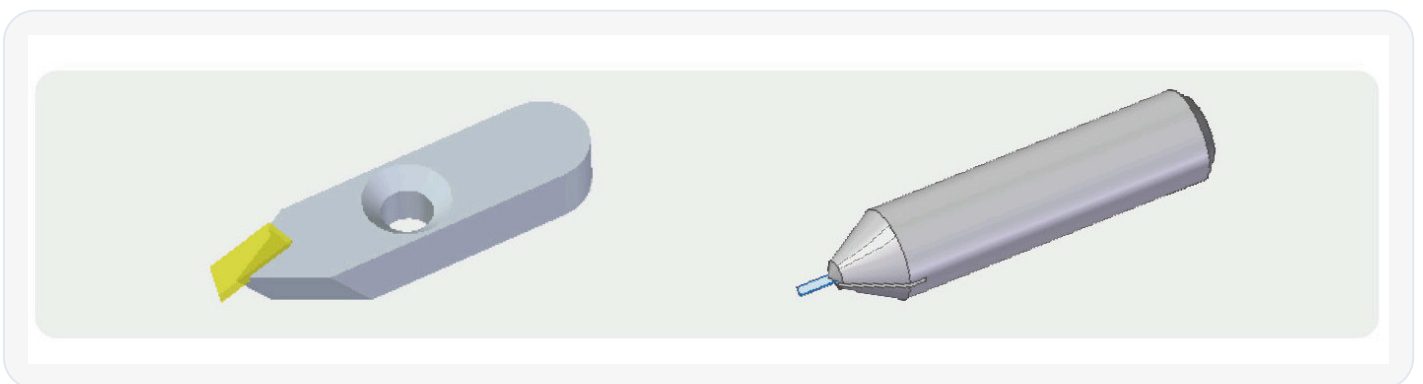
- Turning solution for machining aspheric surface
- Endmilling solution for machining step-shape surface
- Highly precise machining by meticulous location of diamond



FEATURES

- Chipping-free at x1,000 microscope
- Consistent quality
- Optimal accuracy in size
- High vacuum brazed diamond tip

SPEC.	OPTION
Diamond	Natural, Synthetic
Shank	Insert type, Solid type
Processing	Turning, Milling
Clearance Type	Cylindrical, Conical

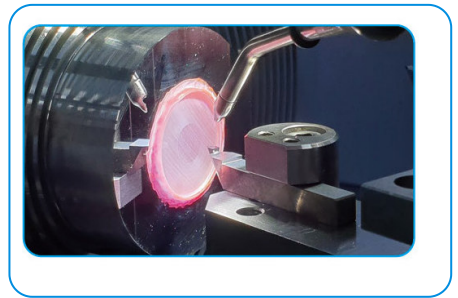


PRECISION TOOLING FOR

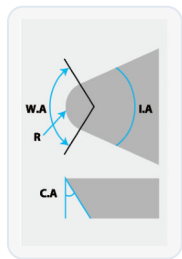
Electro Optics Industry

Plastic Aspheric Lens

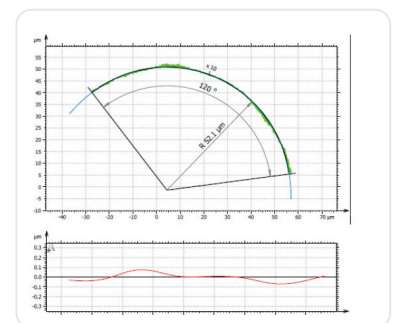
SPC (Super-Precision Cutting tools) maximize the property of single crystal diamond, and are widely used in electro optics industry. EHWA can meet Nose R waviness less than 50 nm for highly accurate contour of super-precision lens mold for plastic aspheric lens.



SPC (Super-Precision Cutting tools) Specification



SPEC.	STANDARD	SPECIAL
Radius	0.01~1.0 mm	<0.01 mm
I.A : Included Angle	$\geq 30^\circ$	$< 30^\circ$
W.A : Window Angle (or Effective Angle)	$\leq 100^\circ$	$> 100^\circ$
C.A : Clearance Angle (or Relief Angle)	$\leq 15^\circ$	$> 15^\circ$
Waviness (Contour Accuracy)	$\leq 0.3 \mu\text{m}$ (300 nm)	$\leq 0.1 \mu\text{m}$ (100 nm)
Clearance Type	Cylindrical or Conical	



Contour accuracy and waviness from the 3D measurement

* Please contact separately for customized design.

FEATURES

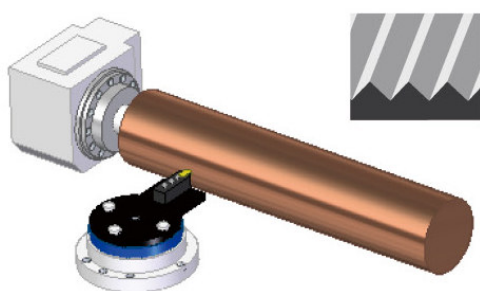
- Performing mirror surface
- Chipping-free at x1,000 microscope
- Waviness of cutting edge less than 50 nm available
- Consistent quality
- Longer tool life
- High vacuum brazed diamond tip



PRECISION TOOLING FOR

Display Industry

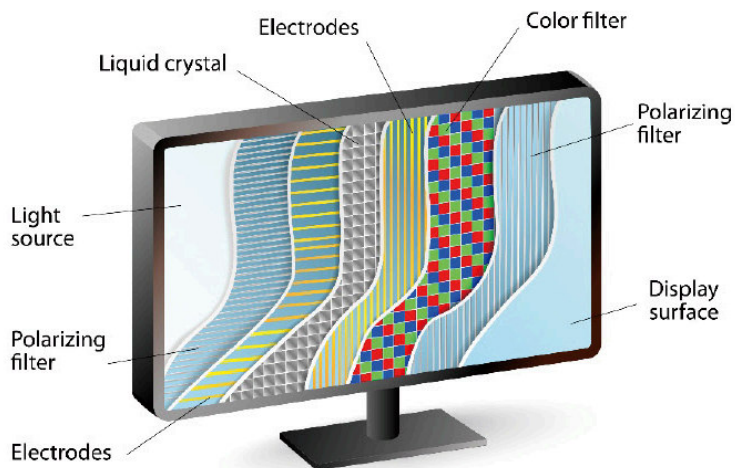
Light Guide Panel / Polarizing Film / Prism Pattern Film



EHWA has developed cutting tools for machining LCD display films (LGP, Polarizing, Pattern film), which are the most important components in LCD monitor.



EHWA's SCD tools are the best choice to achieve mirror surface and to machine large copper rolls for pattern films



FEATURES

- Chipping-free at x1,000 microscope
- Ideal design considering diamond orientation
- Mirror surface finish and burr-free
- Consistent quality
- Longer tool life
- High vacuum brazed diamond tip

SCD Tool Design



N

R003

IA30

CA15

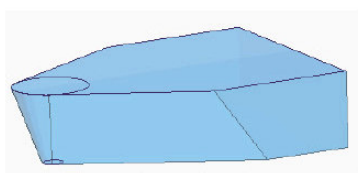
CY

WV01

D

DIAMOND	RADIUS	INCLUDED ANGLE	CLEARANCE ANGLE	CLEARANCE TYPE	WAVINESS	SYMBOL / SHAPE
Natural	Standard:	Standard:	$0^\circ \leq C.A. \leq 25^\circ$	CY : Cylindrical	$\leq 0.05 \mu\text{m}$ (50 nm)	C : 80°
Mono	$0.1 \leq R \leq 10$	$30^\circ \leq I.A. \leq 180^\circ$		CO : Conical	$\leq 0.1 \mu\text{m}$ (100 nm)	D : 55°
SCVD	Special:	Special:			$\leq 0.3 \mu\text{m}$ (300 nm)	S : 90°
	$0.0005 \leq R < 0.1$	$I.A. < 30^\circ$			$\leq 1.0 \mu\text{m}$	T : 60°
					$\leq 2.0 \mu\text{m}$	V : 35°
						X : Special

Clearance Type



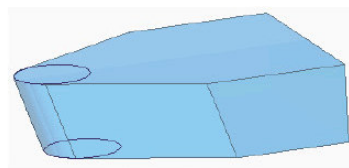
Conical

- ✓ Highly precise contour by true circular shape
- ✓ Relatively weaker geometric structure

Highly precise contour by true circular shape

Relatively weaker geometric structure

Re-grinding reduces radius



Cylindrical

- ✓ Elliptical effect
- ✓ Relatively stronger geometric structure

Elliptical effect

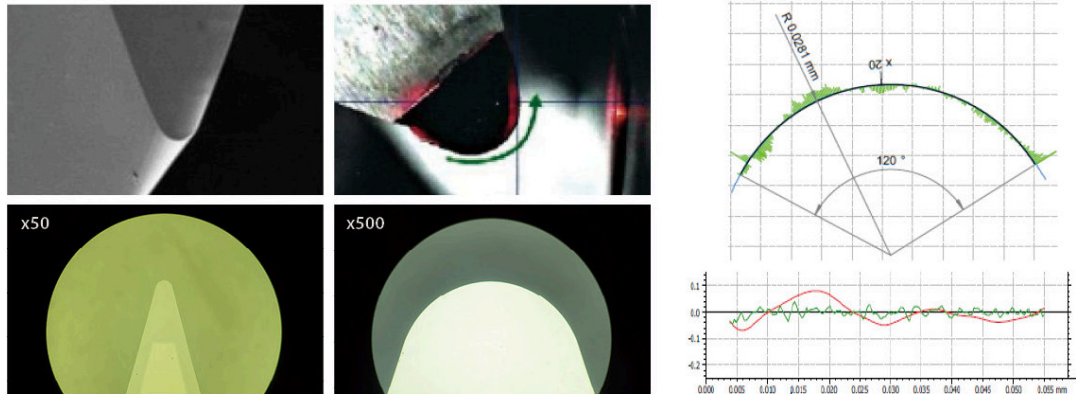
Relatively stronger geometric structure

Consistent radius after re-grinding

Inspection System

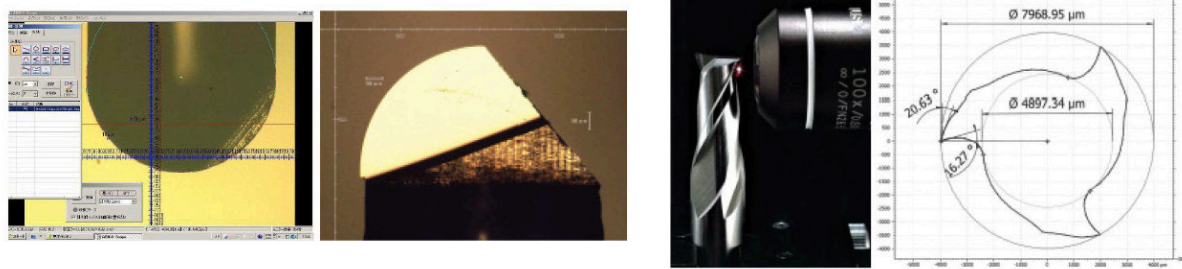
EHWA provide multi-function measurement such as contour accuracy, roughness, precise profile and other dimensions.

Cutting Edge Inspection and Measurement System



Measuring and analyzing the waviness of cutting edge with SEM and 3D measuring machine

Rotating Tool Inspection and Measurement System



Precise analysis of profile by 3D measuring machine

Test Data

EHWA SCD Cutting tool TEST Information

Customer			End user		
Workpiece	Part name		Hardness	HRc / HRb / HB	
	Material *		Roughness	Ra / Rz / Rmax	
Work figure / Drawing					
Machine	M.C.T	☐	C.N.C turning / milling	☐	
	Manual	☐	Machine maker		

Cutting data

Speed (V)	(m/min)
RPM (N)	(1/min)
Feed (F)	(mm/rev) · (mm/min)
D.O.C (Depth of cut) *	(pass) · (mm)

Cutting condition

Continuous *	Continuous	☐
Interrupt *	Light	☐
	Medium	☐
	Heavy	☐
Coolant *	Dry	☐
	Wet (Inner / Out)	☐

Tool Information

Tool material *	SCD Natural	☐
	SCVD	☐
	Mono	☐
	PCD	☐
	PCBN	☐
	CVD	☐
	Others	☐
Shank *	Tungsten Carbide (T.C)	☐
	STEEL	☐
	T.C + STEEL	☐
	SUS	☐
	Titanium (Ti)	☐
	Others	☐

SPEC *		
Competitor *		
Tool life (time) · (EA)		
Operation *	Turning	☐
	Milling	☐
	Boring	☐
	Grooving / Cutting	☐
	Reaming	☐
	Endmilling	☐
	Drilling	☐
	Wearless	☐
Need to be determined *		☐



EHWA diamond tools serve as a promoter of globalization

Since 1975, EHWA DIAMOND has been growing by developing long-term partnerships with customers worldwide and across the industries. EHWA is tirelessly striving to provide the very best customer satisfaction through continuous product innovation and world class service.

Korea



Osan (HQ)



Osan 2



Dongtan (R&D)



Pyeongtaek



Seocheon



Cheongju

Global location



China (shanghai)



China (weihai)



China (fujian)



Indonesia (jakarta)



Vietnam (hanoi)



Vietnam (hai duong)



USA (irvine)



Japan (nagoya)



Thailand (bangkok)



Germany (frankfurt)



India (chennai)



Mexico (monterrey)



Italy (carrara)

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For a tool design we need material, part geometry and process data – or simply fill in the test data sheet.

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APPLICATIONS

Electro Optics, Display, Medical (IOL, Contact Lens)
Super-precision turning, milling and mould making