

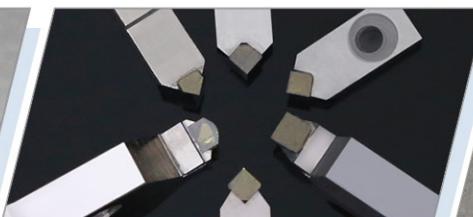
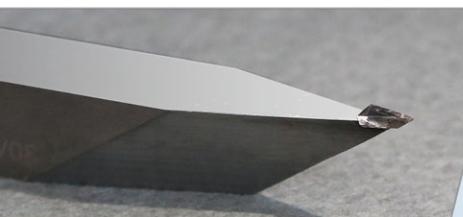
EHWA

**Single Crystalline Diamond
Cutting Tools**

A leading technology of super-precision machining

SCD

Electro Optics, Display, Medical (IOL, Contact Lens)



EHWA DIAMOND

Single Crystalline Diamond Cutting Tools

SCD / MCD Tools

High Precision Cutting Tools with
Single Crystalline(Monocrystalline) Diamonds



Features

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



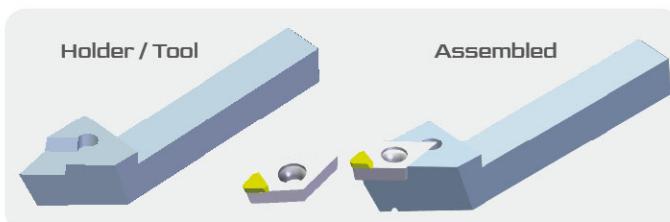
Precision Tooling For Medical Industry

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

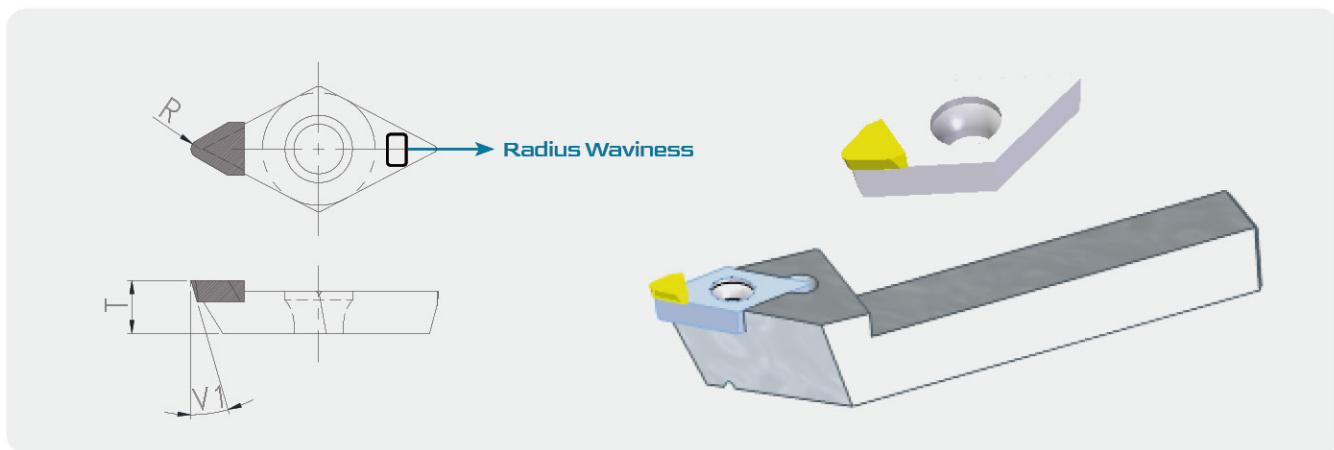
- Chipping-free at x1,000 microscope
- Consistent quality
- Longer tool life
- High vacuum brazed diamond tip

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

Precision Tooling For Medical Industry

Specification Of

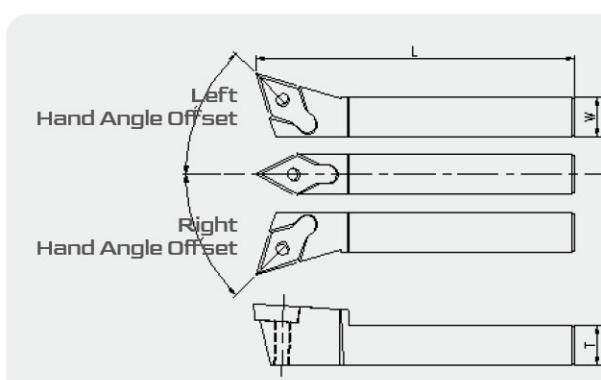
Contact Lens Tool



Material	Insert Type	Radius	Clearance Angle	Clearance Type	Contour (Waviness, μm)
EN : Natural	D : 55° DCGW0702	R025 : R0.25	CA10 : 10° CA12 : 12° CA15 : 15° CA16 : 16° CA18 : 18°		Controlled W005 : ≤ 0.05
EM : Mono(HPHT)	DCMW11T3	R03 : R0.3		CO : Conical	W01 : ≤ 0.1
EV : Mono(CVD)	V : 35° VCGW1103	R05 : R0.5		CY : Cylindrical	W02 : ≤ 0.2 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)

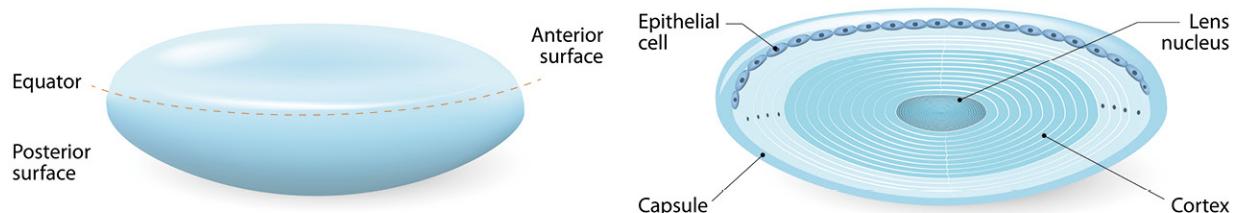
- ✓ Available for both solid and insert type
- ✓ Available in adjusting body length and thickness
- ✓ Tungsten Carbide shank

Precision Tooling For Medical Industry

Specification Of

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:

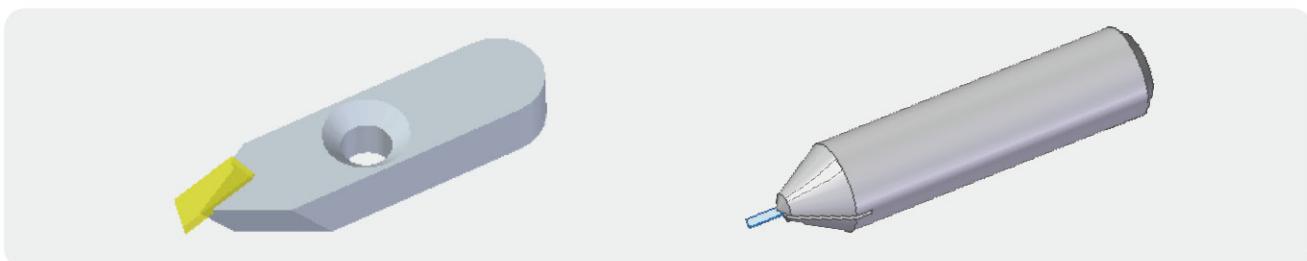
- Turning solution for machining aspheric surface
- Endmilling solution for machining step-shape surface
- Highly precise machining by meticulous location of diamond



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





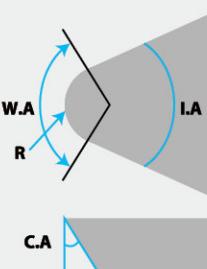
Precision Tooling For Electro Optics Industry

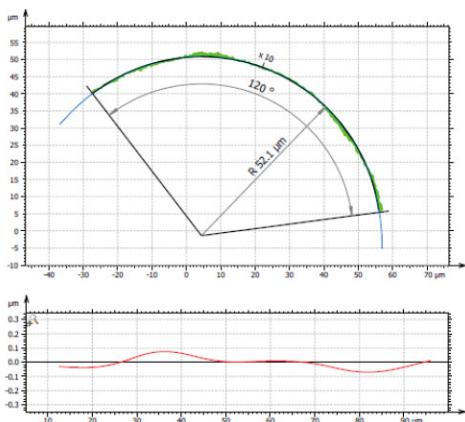
Plastic Aspheric Lens

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 50nm for highly accurate contour of super-precision lens mold for plastic aspheric lens.



SPC (Super-Precision Cutting tools) Specification

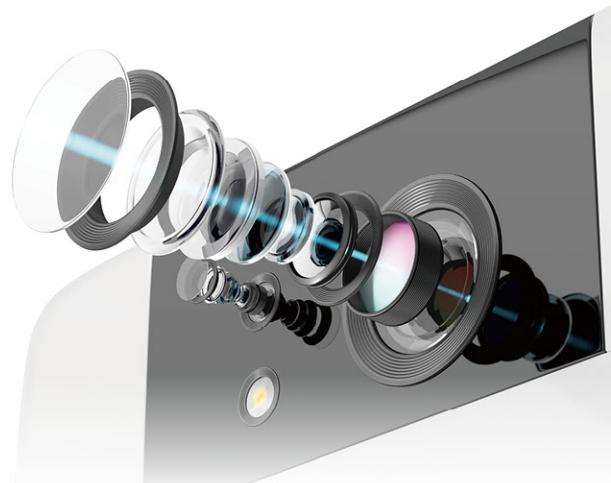
Shape	Spec.	Standard	Special
	Radius	0.01~1.0mm	<0.01mm
	I.A : Included Angle	$\geq 30^\circ$	$< 30^\circ$
	W.A : Window Angle (or Effective Angle)	$\leq 100^\circ$	$> 100^\circ$
	C.A : Clearance Angle (or Relief Angle)	$\leq 15^\circ$	$> 15^\circ$
	Waviness (Contour Accuracy)	$\leq 0.3\mu\text{m}$ (300nm)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



* Please contact separately for customized design.

Features

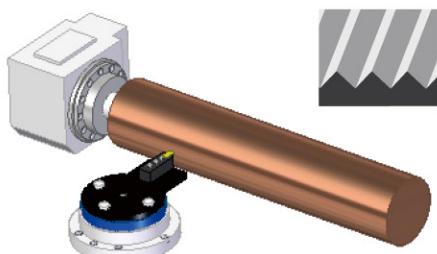
- Performing mirror surface
- Chipping free at x1,000 microscope
- Waviness of cutting edge less than 50 nm available
- Consistent quality
- Longer tool life
- High vacuum brazed diamond tip





Precision Tooling For Display Industry

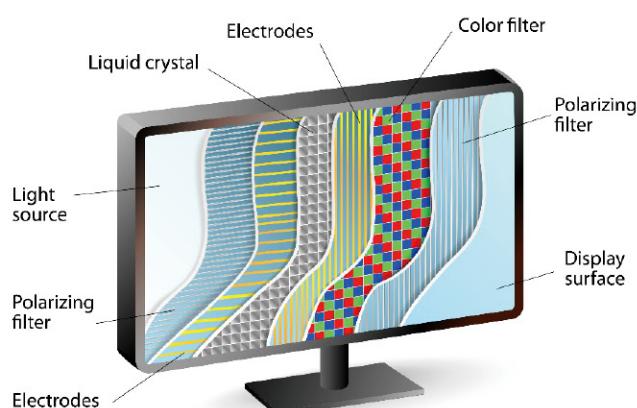
Light Guide Panel / Polarizing Film / Prism Pattern Film



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

Diamond Material / Geometry / Shank Type



N

R003

IA30

CA15

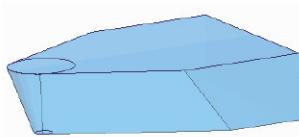
CY

WV01

D

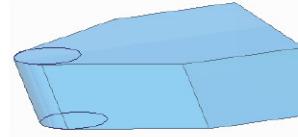
Diamond	Radius	Included Angle	Clearance Angle	Clearance Type	Waviness	Symbol	Shape
Natural	Standard : $0.1 \leq R \leq 10$	Standard : $30^\circ \leq I.A. \leq 180^\circ$		CY : Cylindrical	$\leq 0.05 \mu\text{m}$ (50nm) $\leq 0.1 \mu\text{m}$ (100nm) $\leq 0.3 \mu\text{m}$ (300nm)	C	
Mono			$0^\circ \leq C.A. \leq 25^\circ$			D	
SCVD	Special : $0.0005 \leq R < 0.1$	Special : I.A. < 30°		CO : Conical	$\leq 1.0 \mu\text{m}$ $\leq 2.0 \mu\text{m}$	S	

Clearance Type



Conical

- ✓ Highly precise contour by true circular shape
- ✓ Relatively weaker geometric structure
- ✓ Re-grinding reduces radius



Cylindrical

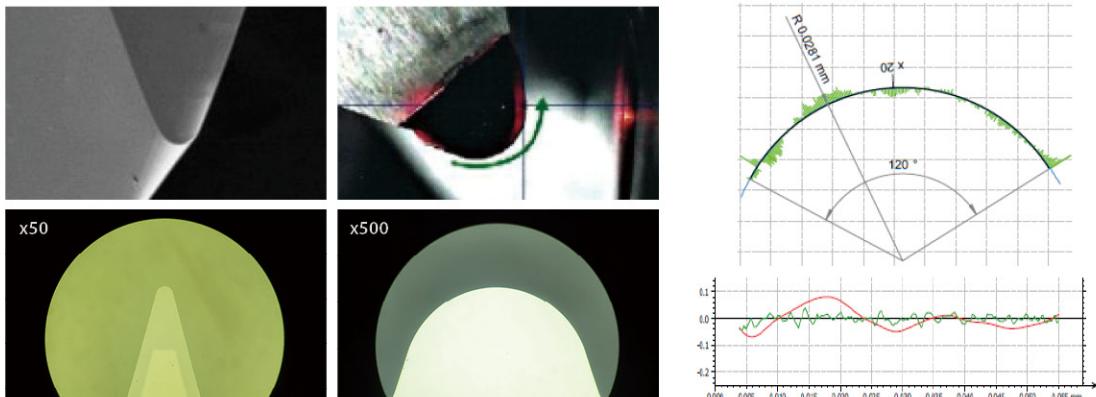
- ✓ Elliptical effect
- ✓ Relatively stronger geometric structure
- ✓ Consistent radius after re-grinding

Inspection System

Microscope / SEM / 3D Roughness Measurement

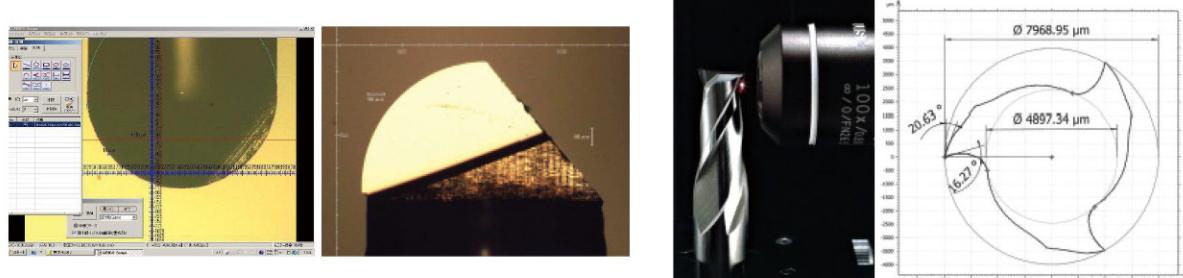
EHWA provide multi-function measurement such as contour accuracy, roughness, precise profile and other dimensions

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

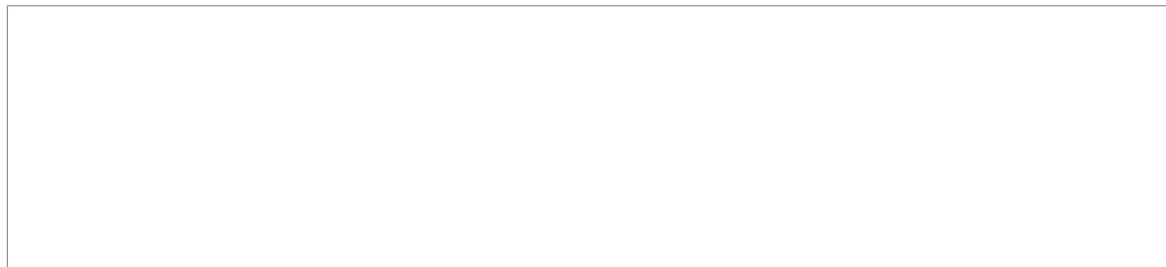
Test Data

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	<input type="checkbox"/>	C.N.C turnig / milling	<input type="checkbox"/>
	Manual	<input type="checkbox"/>	Machine maker	

Cutting data

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

Cutting condition

Continuous *	Continuous	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Light	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Interrupt *	Medium	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Heavy	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Coolant *	Dry	<input type="checkbox"/>	<input type="checkbox"/>
	Wet (Inner/Out)	<input type="checkbox"/>	<input type="checkbox"/>

Tool Information

Tool material *	Natural	<input type="checkbox"/>
	SCD	<input type="checkbox"/>
	SCVD	<input type="checkbox"/>
Tool material *	Mono	<input type="checkbox"/>
	PCD	<input type="checkbox"/>
	PCBN	<input type="checkbox"/>
	CVD	<input type="checkbox"/>
	Others	<input type="checkbox"/>

SPEC * _____

Shank *	Tungsten Carbide(T.C)	<input type="checkbox"/>
	STEEL	<input type="checkbox"/>
	T.C+STEEL	<input type="checkbox"/>
	SUS	<input type="checkbox"/>
	Titanium(Ti)	<input type="checkbox"/>
	Others	<input type="checkbox"/>

Competitor * _____

Tool life _____ (time)
(EA)

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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