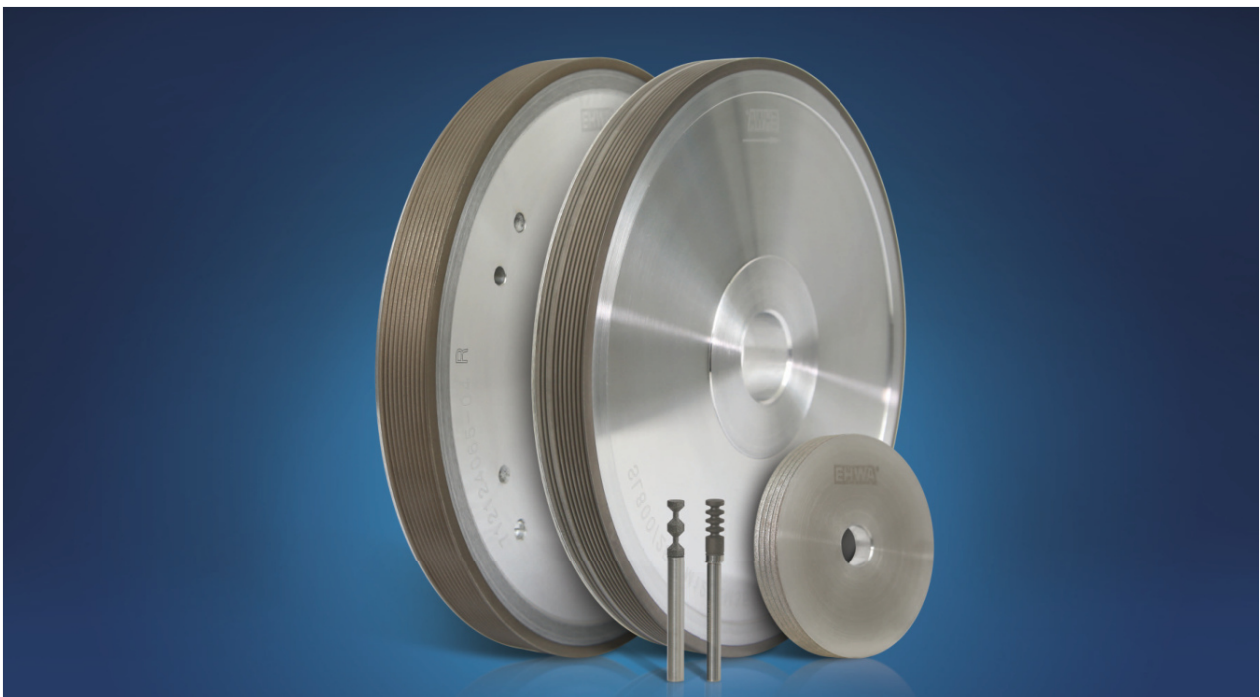


Diamond tools for glass, display, LED and solar

Diamond tools for glass, display, LED and solar



EHWA Europe GmbH

www.ehwadia.de

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Glass, display, LED and solar: coordinated machining

EHWA DIAMOND - since 1975

EHWA combines diamond grit, bond, tool profile and manufacturing method with the requirements of glass, silicon, sapphire and other hard materials. The programme covers cutting and edge machining, lapping and polishing, and wafer machining. It supports display and mobile-device production, LED and solar applications, and automotive, home-appliance, architectural and optical glass.

Tool design depends on material, glass or wafer thickness, machine, mounting method, machining stage and surface target. The sheets contain several programme versions: different diameters, grit ranges, wire codes and test conditions remain separate variants. The documented comparisons support selection; their results refer to the illustrated application.

Editorial edition: 13 October 2026. The date identifies this German-English compilation. EHWA Europe is available to support the specific tool design.

Tools for automotive, home-appliance, architectural and optical glass

The glass tools include profiles for automotive glazing, home appliances and architectural glass, and versions for optical lenses and crystal glass. The illustrations show wheels, multi-groove profiles and shank tools. Specific applications include side mirrors, glass holes and home-appliance glass edges.

For automotive glass, the programme lists three bond characters in the same D107~D30 grit range: MB softer, MC standard and MG harder. This allows tool selection to match the machining task. The micrographs show the corresponding versions.

Series	Grit size	Bond character
MB	D107~D30	Softer
MC	D107~D30	Standard
MG	D107~D30	Harder



Application view from the illustrated machining area.



Tool version for the illustrated application.



Tool version for the illustrated application.



Tool version for the illustrated application.



Tool version for the illustrated application.



Tool version for the illustrated application.



MB series: softer bond character, D107~D30.



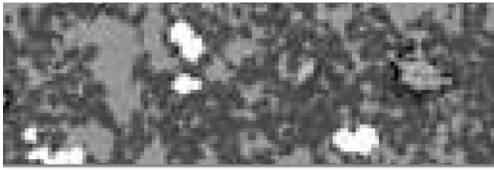
MC series: standard bond character, D107~D30.



Tool version for the illustrated application.



Tool version for the illustrated application.



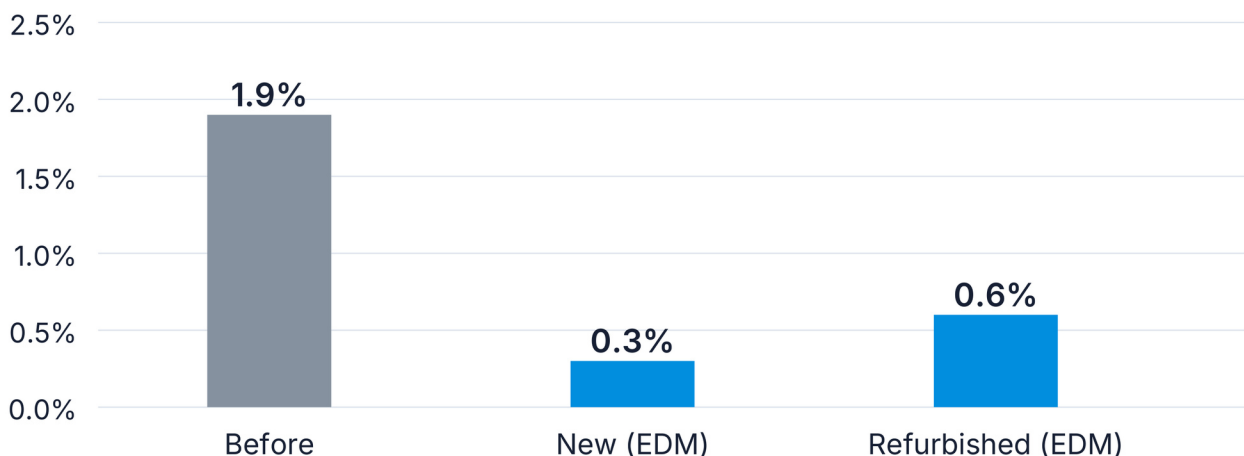
MG series: harder bond character, D107~D30.

Home-appliance glass: new and refurbished tools

The developed wheels are designed for strong edge quality and reduced chipping. The illustrated EDM comparison shows 1.9% before the change, 0.3% with the new tool and 0.6% with the refurbished tool. The source describes a value below 1% after refurbishment. The tool design is matched to your glass and process.

Comparison condition	Chipping [%]
Before	1.9
After: new (EDM)	0.3
After: refurbished (EDM)	0.6

Glass machining: chipping in the EDM comparison



Illustrated application example, not a universal limit guarantee.

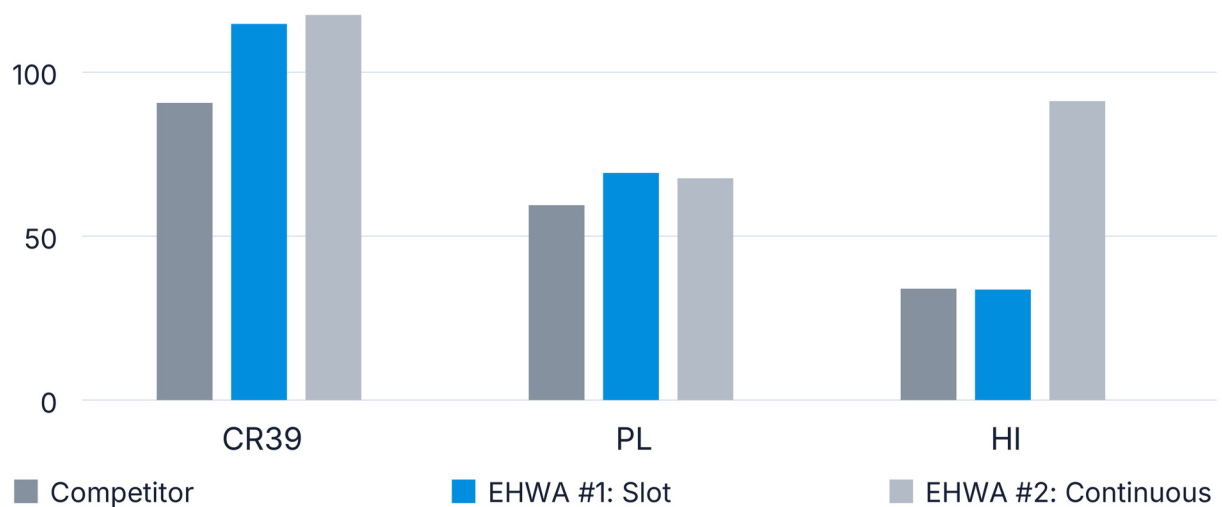
Chipping before the change and with new and refurbished EDM tools.

Optical lenses: roughing, finishing and polishing

The optical programme distinguishes GL roughing with MD-1A1, PL roughing with MD-BSL, and finishing and polishing with MD-1EE6Y. Grit ranges remain separate for each stage. The BSL Slot (#1) and Continuous (#2) versions are compared with a reference tool for CR39, PL and HI. The numerical axis has no stated unit; the bars show the relative performance comparison.

Process	Type	Grit size
Roughing (GL)	MD-1A1	D251~D151
Roughing (PL)	MD-BSL	D301~D151
Finishing	MD-1EE6Y	D46~D30
Polishing	MD-1EE6Y	D2

Optical lenses: BSL grinding comparison



Source axis without a unit; bar geometry without added measurements.

BSL comparison for CR39, PL and HI: reference, Slot and Continuous.



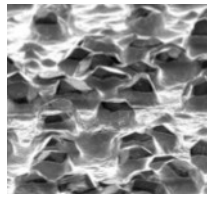
Application view from the illustrated machining area.



BSL Slot version, tool #1.



BSL Continuous version, tool #2.



Grinding-wheel surface for optical-glass machining.



Tool version for the illustrated application.



Metal-bond profile tool for side-mirror glass.



Metal-bond tool during glass-hole grinding.



Metal-bond edge wheel for home-appliance glass.

Metal-bond edge tools for LCD and OLED

Metal-bond tools provide different groove profiles, uniform chamfer widths and strong profile retention. Roughing and finishing can be combined in one tool version. The programmes are designed for LCD/OLED panels and glass edges.

The first version lists MD-DW with $\varnothing 8 \sim \varnothing 100$ and MD-1FF6Y with $\varnothing 40 \sim \varnothing 200$ and #325~#3000. Its panel test additionally states wheel wear of $35 \sim 40 \mu\text{m}$. The second version lists $\varnothing 5 \sim \varnothing 50$ and $\varnothing 50 \sim \varnothing 200$ and

#325~#2000; its comparison explicitly refers to a 15-inch panel. These versions are not combined into one dimensional range.

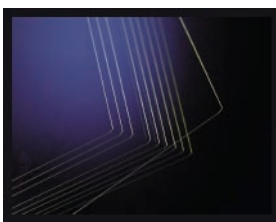
The measurement images supplement edge strength, tool life and chipping size. They retain their profile axes and topography annotations. The additional profile is labelled Ra 0.385; its visible source annotations remain authoritative without turning this into a universal product specification.

Type	Diameter (source notation)	Thickness [mm]	Grit size	Bond
MD-DW	Ø8~Ø100	5~20	#325~#3000	Metal
MD-1FF6Y	Ø40~Ø200	5~80	#325~#3000	Metal

Application	Edge strength [MPa]	Lifetime [cells/groove]	Wheel wear [µm]	Chipping size [µm]
Panel grinding	120~130	100	35~40	<30

Type	Diameter (source notation)	Thickness [mm]	Grit size	Bond
MD-DW	Ø5~Ø50	5~20	#325~#2000	Metal
MD-1FF6Y	Ø50~Ø200	5~80	#325~#2000	Metal

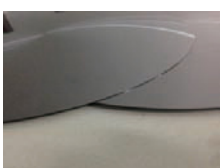
Application	Edge strength [MPa]	Lifetime [cells/groove]	Chipping size [µm]
15-inch panel grinding	120~130	100	<30



Application view from the illustrated machining area.



Application view from the illustrated machining area.



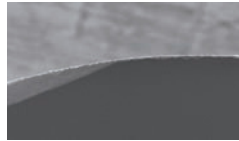
Application view from the illustrated machining area.



Application view from the illustrated machining area.



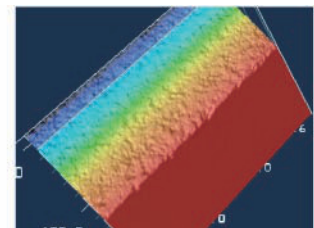
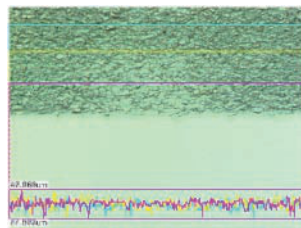
Metal-bond edge-grinding wheels and shank tools.



Machined surface with its image and measurement information retained.



Machined surface with its image and measurement information retained.



Machined surface with its image and measurement information retained.



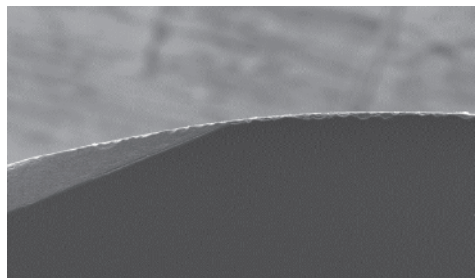
Machined surface with its image and measurement information retained.



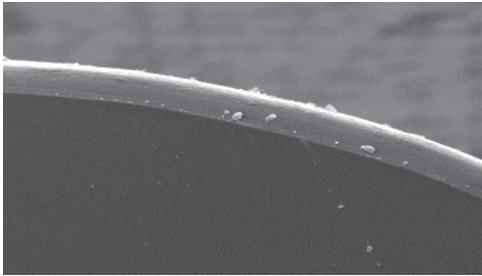
Application view from the illustrated machining area.



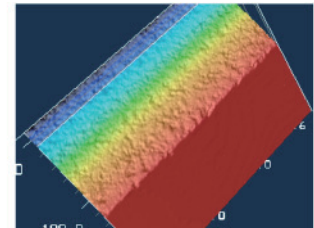
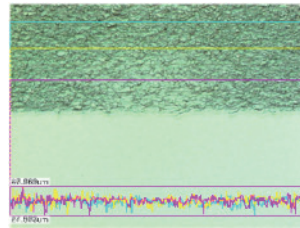
Application view from the illustrated machining area.



Machined surface with its image and measurement information retained.



Machined surface with its image and measurement information retained.



Machined surface with its image and measurement information retained.



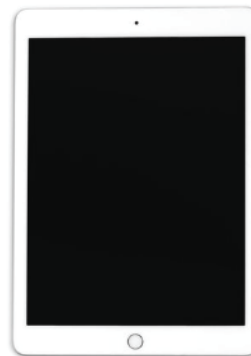
Application view from the illustrated machining area.



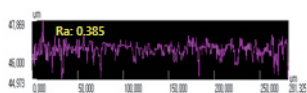
Tool version for the illustrated application.



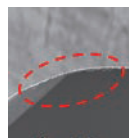
Application view from the illustrated machining area.



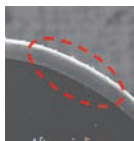
Application view from the illustrated machining area.



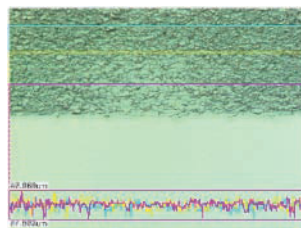
Surface profile labelled Ra 0.385; the image retains its measurement annotations.



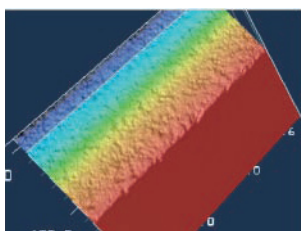
Glass edge after grinding, first detail view with source marking.



Glass edge after grinding, second detail view with source marking.



Surface measurement with complete source axes.



Three-dimensional topography with source measurement annotations.

Electroplated edge-grinding tools: double and triple mesh

Controlled diamond distribution and an appropriate grit size and concentration support consistent tool quality and clean edges. Precision electroplating is designed for dimensional accuracy and uniform profiles. The tools machine LCD/OLED panels, smartphone cover glass, and sapphire and silicon wafer edges.

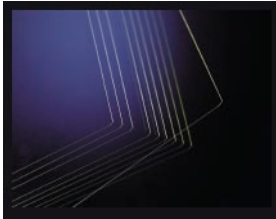
The earlier double-mesh version combines roughing and finishing and states 50% longer life in its illustrated competitor comparison. A further version offers double and triple mesh. ED-DW diameters differ between Ø0.5~Ø100 and Ø0.5~Ø40. ED-1FF6Y is listed with Ø20~Ø300. The product presentation explicitly lists DW-1FF6Y at this position; that source designation is retained.

The ten edge images compare EHWA and the reference tool at 325, 400, 600, 800 and 1000 mesh. The red source markers remain visible in the comparison images. The example documents this machining condition and does not replace application-specific tool-life or edge-quality validation.

Type	Diameter (source notation)	Grit size	Bond
ED-DW	Ø0.5~Ø100	#100~#1500	Electroplated
ED-1FF6Y	Ø20~Ø300	#100~#1500	Electroplated

Type	Diameter (source notation)	Grit size	Bond
ED-DW	Ø0.5~Ø40	#100~#1500	Electroplated
ED-1FF6Y	Ø20~Ø300	#100~#1500	Electroplated

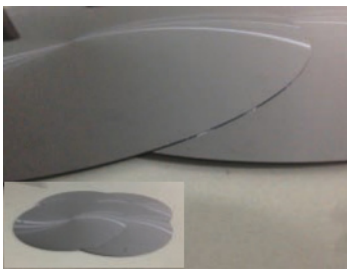
Type	Diameter (source notation)	Grit size	Bond
ED-DW	Ø0.5~Ø100	#100~#1500	Electroplated
DW-1FF6Y	Ø20~Ø300	#100~#1500	Electroplated



Display glass as an application example.



Ingot and wafer shapes for edge machining.



Silicon wafers and machined wafer edges.



Electroplated edge-grinding tools: wheels and shank versions.



EHWA, 325 mesh: machined glass edge.



EHWA, 400 mesh: machined glass edge.



EHWA, 800 mesh: machined glass edge.



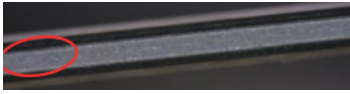
EHWA, 1000 mesh: machined glass edge.



EHWA, 600 mesh: machined glass edge.



Comparison tool, 400 mesh: machined glass edge.



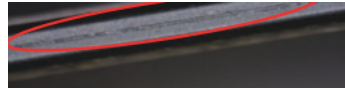
Comparison tool, 600 mesh: machined glass edge.



Comparison tool, 800 mesh: machined glass edge.



Comparison tool, 325 mesh: machined glass edge.



Comparison tool, 1000 mesh: machined glass edge.



Electroplated edge-grinding tools in the double/triple-mesh programme.



Electroplated wheels and shank tools in the 12/2018 edition.



Electroplated edge-grinding tools on a light background.



Electroplated shank tool with multiple grooves.

Scribing wheels for glass and displays

Automated manufacturing supports consistent scribing performance. The wheels are designed for low defects and high glass-edge strength across different glass thicknesses. CGC supports stable scribing of brittle materials; NGC creates a deep vertical crack and can be used without a separate breaking step in the illustrated application. HPES is designed for high edge strength.

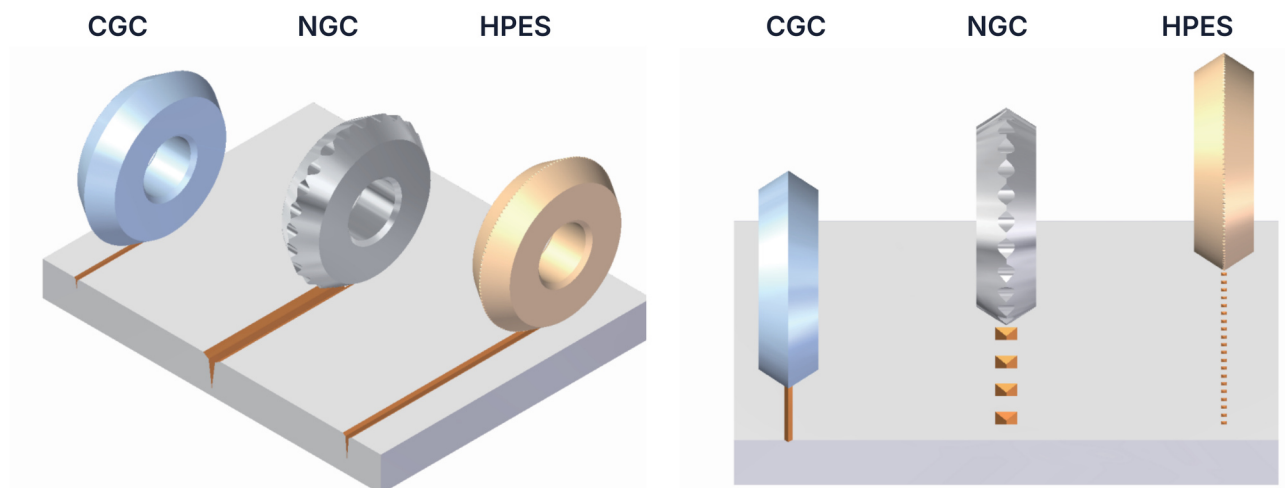
Angle, notch count and notch depth are matched to glass thickness and application. The older six-row table ends at ~0.2 mm; the product presentation lists ~0.1 mm in the same final row. Both versions are retained. No unit is stated for notch depth.

The comparison curve shows edge strength [MPa] over cutting distance [km] for NGC and HPES. It retains the source curve geometry without estimated individual measurements. Glass type, scribing force, speed and angle affect crack formation and edge quality; wheel selection is matched to this process.

Glass thickness [mm]	Angle	Number of notches	Notch depth (source unit unstated)	Application
1.0~	125°~150°	80~140	9~15	Automotive glass, solar cells
0.5~	115°~125°	135~140	10	TFT LCD
0.4~	105°~115°	135~170	5.5~10	PDP glass for TV/monitor
0.3~	100°~110°	150~400	3.5~7	TFT LCD / AMOLED for mobile devices
0.2~	95°~105°	200~600	2~3	TFT LCD / AMOLED for mobile devices
~0.2	90°~100°	50~720	1.5~3	FPD, mobile cells

Glass thickness [mm]	Angle	Number of notches	Notch depth (source unit unstated)	Application
1.0~	125°~150°	80~140	9~15	Automotive glass, solar cells
0.5~	115°~125°	135~140	10	TFT LCD
0.4~	105°~115°	135~170	5.5~10	PDP glass for TV/monitor
0.3~	100°~110°	150~400	3.5~7	TFT LCD / AMOLED for mobile devices
0.2~	95°~105°	200~600	2~3	TFT LCD / AMOLED for mobile devices
~0.1	90°~100°	50~720	1.5~3	FPD, mobile cells

CGC, NGC and HPES: scribing-wheel and contact shapes



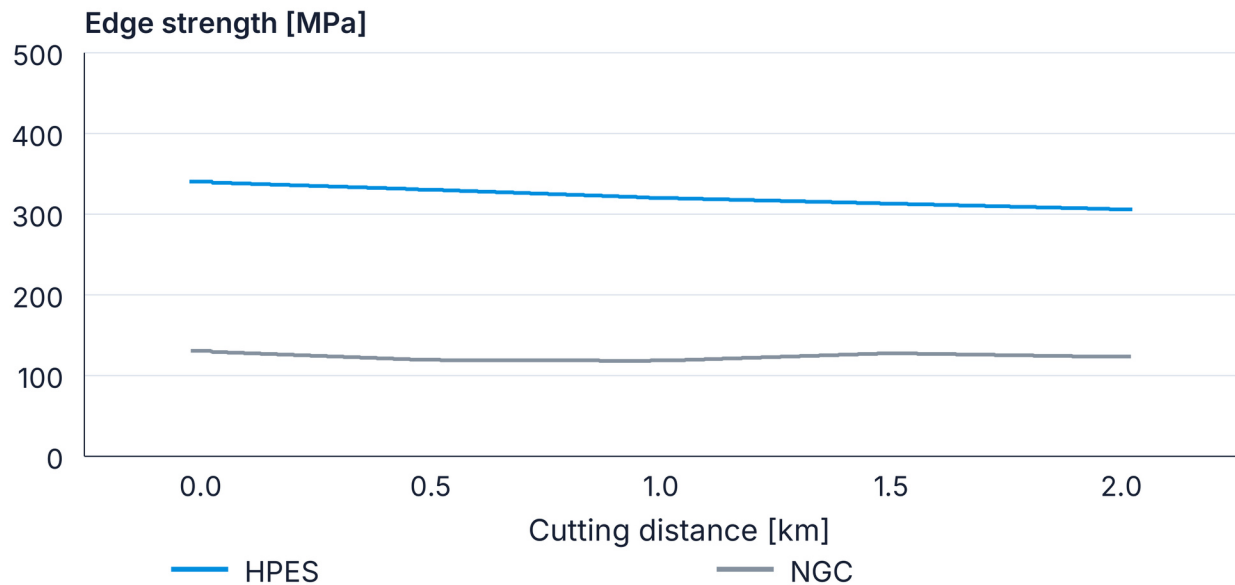
CGC: stable scribing of brittle materials.

NGC: deep vertical crack, without breaking in the illustrated application.

HPES: designed for high glass-edge strength.

CGC, NGC and HPES: wheel forms and contact principle.

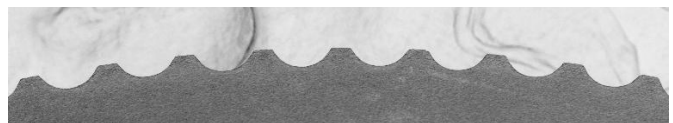
Scribing wheels: edge strength in the test



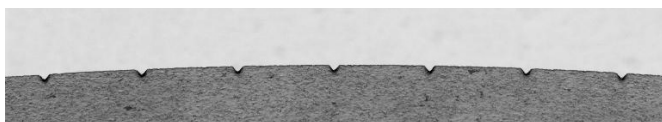
Edge strength of NGC and HPES over cutting distance.



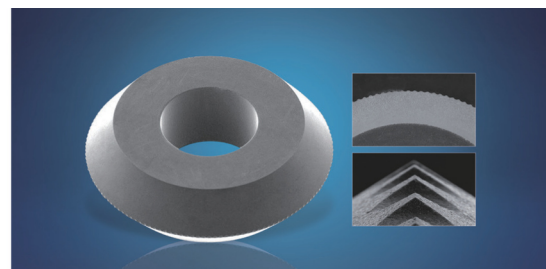
CGC: edge structure in the illustrated scribing test.



NGC: edge structure in the illustrated scribing test.



HPES: edge structure in the illustrated scribing test.



Scribing wheel with cutting-edge detail views.

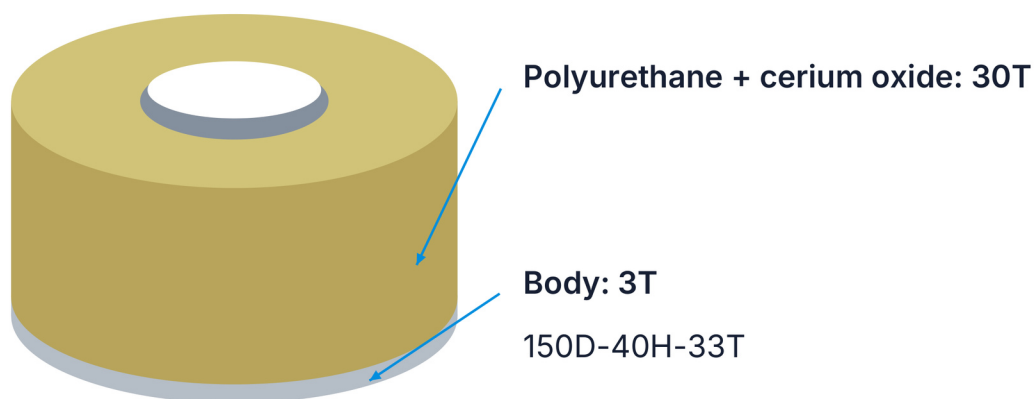
Edge polishing with polyurethane and cerium oxide

Edge-polishing wheels for mobile LCD and OLED panels combine removal performance, surface quality and usable life. The compliant polishing action supports strong edges. The sheets describe longer life and fewer tool changes than their comparison wheel, aiming for lower consumable cost and high throughput.

The illustrated version carries the size designation 150D-40H-33T. The polyurethane/cerium-oxide layer is designated 30T and the body 3T. Two microstructure images at 500× and 1000× show the structure and retain their source scales.

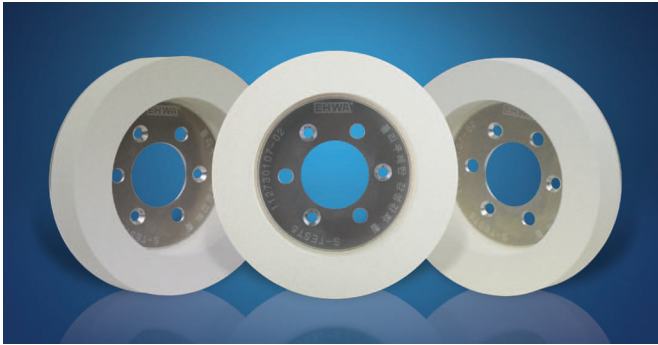
Feature	Designation / value
Size designation	150D-40H-33T
Polyurethane + cerium oxide	30T
Body thickness	3T
Microstructure magnifications	500× / 1000×

Edge polishing: polyurethane and cerium oxide

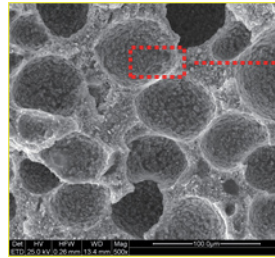


Microstructure images: 500× and 1000× in the accompanying section.

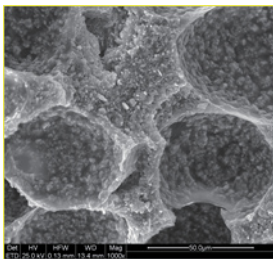
Polyurethane/cerium oxide: polishing layer and body.



Polyurethane and cerium-oxide edge-polishing wheels.



Polyurethane/cerium oxide: microstructure at 500× with its source scale.



Polyurethane/cerium oxide: microstructure at 1000× with its source scale.

Polishing tools for glass, aluminium cases and cutting edges

Foam pads, polyurethane groove wheels, brushes and resin diamond tools extend the polishing programme. Applications range from aluminium mobile-device cases and glass to SUS machining on smartwatch backs. The table retains the different abrasives and the #800 version.

Polyurethane can reduce glass chipping after metal-bond machining. Its elasticity supports fine grinding and polishing; hardness and abrasive content can be adjusted. The hard version shows local marks of 66.67, 74.83 and 61.22 μm after metal #500 and 6.94 μm after EHWA polyurethane polishing. The sheet itself notes that chamfer quality depends on the process recipe.

For cutting edges, the product presentation describes improved roughness, easier chip evacuation, cutting ability and life, and strong chamfer surfaces. Its specific polishing example shows Ra 1.476 μm before and Ra 0.337 μm after polishing. The bond is polyurethane, with diamond #400~#1200 and SiC #400~#1500 abrasive ranges.

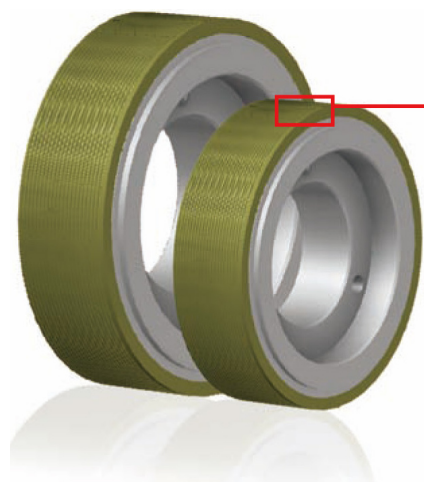
Tool	Abrasives / grit size	Application
Polyurethane sponge pad (foam type)	Diamond, SiC, Al_2O_3 , CeO_2	Polishing aluminium mobile-device cases
Polyurethane groove wheel	Diamond, SiC	Glass machining
Brush, DW type	Diamond, SiC, Al_2O_3	Polishing aluminium mobile-device cases
Resin diamond wheel	Diamond #800	Smartwatch back side, SUS grinding

Surface / tool	Printed local measurements
After metal #500	66.67 μm / 74.83 μm / 61.22 μm
After EHWA polyurethane wheel	6.94 μm

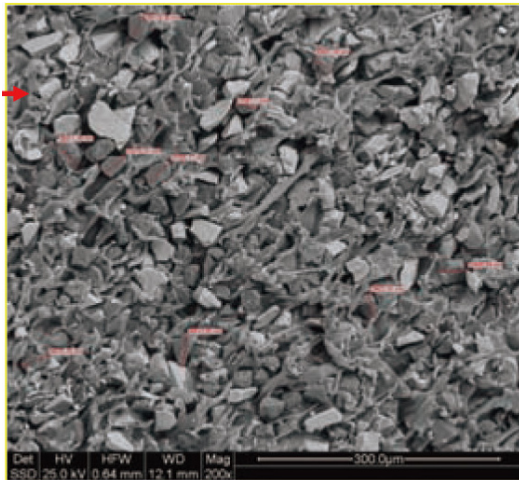
Feature	Value
Bond	Polyurethane
Diamond grit	#400~#1200
SiC grit	#400~#1500
Ra before polishing	1.476 μm
Ra after polishing	0.337 μm



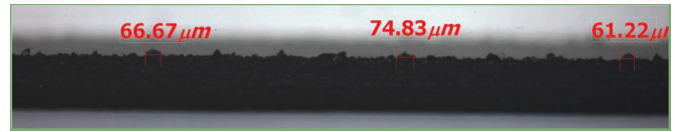
Foam pad, groove wheel and brush tool for polishing.



Hard polyurethane groove wheel.



Microstructure of the hard polyurethane version with its source scale.



Glass edge after metal #500: local measurement marks are retained.



Glass edge after polyurethane polishing: local measurement marks are retained.



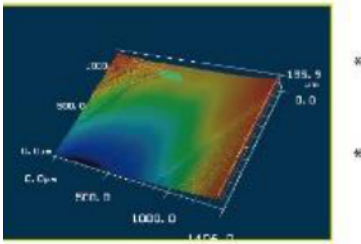
Polyurethane groove wheels for glass machining.



Microstructure of the polyurethane version for tool polishing.



Polished tool area with its source position marker.



Topography measurement of the polished tool area.

Iron-resin lapping plates for sapphire and silicon

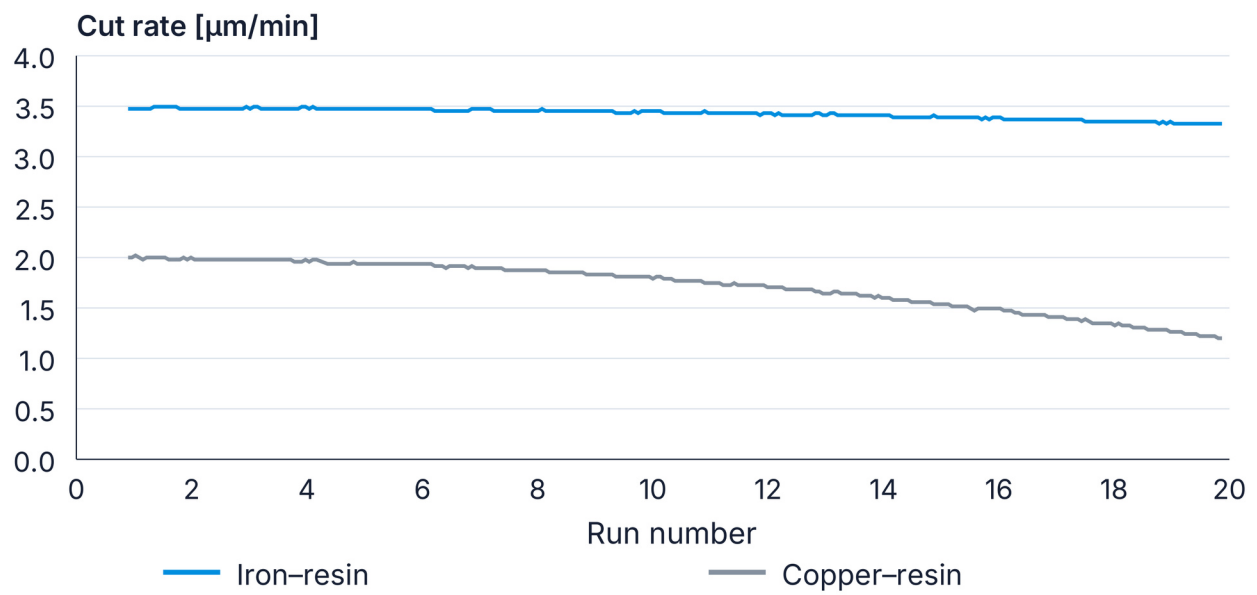
Iron-resin plates are described for precision lapping of patterned sapphire, bare sapphire and bare silicon substrates. Strong ductility supports low-damage machining. The sheet highlights removal performance, life and thermal stability, linking these properties to uniform, finely machined wafer surfaces.

The programme table states cut rate as 2.5~5.0 μm without a time denominator. The separate test curve uses $\mu\text{m}/\text{min}$. Both statements retain their own context. The test compares iron-resin and copper-resin at 400 g/cm^2 , 90 rpm and a slurry flow of 4 ml/min. The 50 $\times$ images supplement the surface comparison after lapping.

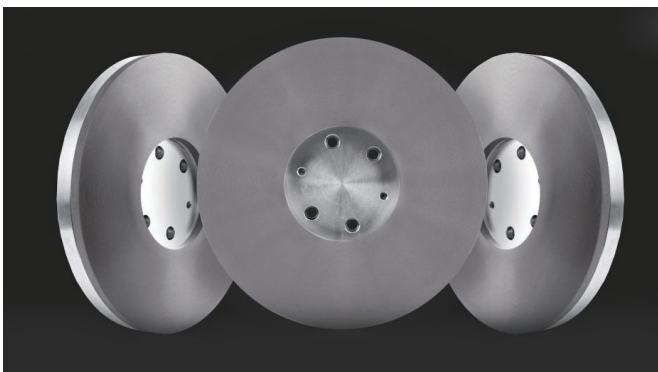
Application	Outside diameter [mm]	Inside diameter [mm]	Thickness [mm]	Cut rate [μm]
Sapphire-wafer lapping	$\varnothing 510 \sim \varnothing 1100$	$\varnothing 50 \sim \varnothing 500$	12~25	2.5~5.0

Parameter	Condition
Pressure	400 g/cm^2
Plate speed	90 rpm
Polisher	Single-head type
Wafer	4-inch single-crystal sapphire wafer
Plate comparison	Copper-resin / iron-resin
Slurry primary particle diameter	3 μm
Slurry flow rate	4 ml/min
Surface comparison	50 $\times$

Iron-resin and copper-resin: removal comparison



Removal curves in the iron-resin/copper-resin test.



Iron-resin lapping plates for sapphire.



Comparison surface after lapping: copper-resin, 50 $\times$.



Surface after lapping: iron-resin, 50 $\times$.

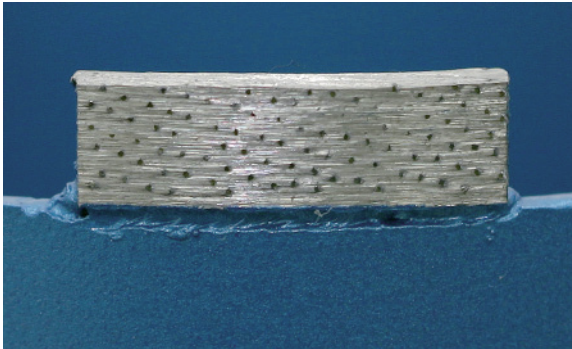
Zenesis core drills for ingots and ceramic substrates

The Zenesis concept uses patterned diamond arrays and alternating diamond layers. Diamond exposure height, diamond-tail length and debris-clearance channels can be matched to the workpiece. The aim is high cutting speed, long life, low tool-to-tool variation and economical volume production with consistent performance throughout usable life.

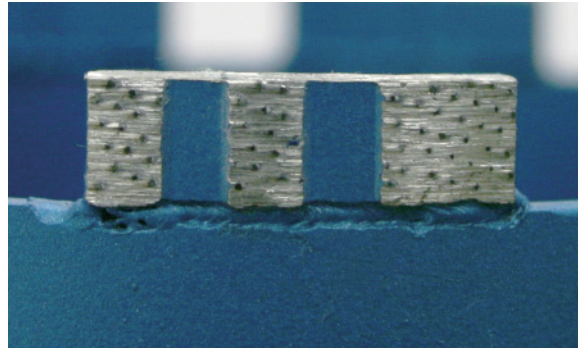
The sheet lists sapphire and silicon ingots and ceramic substrates. Zenesis turbo is shown alongside the Zenesis segment version. The programme lists 2", 4", 6" and 8" and a length of ~500 without a printed unit. The connection is literally stated as 1/2 BSP, 11/14 UNC; further connections are available on request. The unusual UNC designation is checked against the connection drawing before ordering.

The alumina/SiC substrate and susceptor example states a reduction from 4 to 2 hours when increasing outside diameter from Ø2-Ø10 to Ø203. The example does not print a unit for diameter. For ingots, the source describes long life and low current. These examples illustrate their specific tool designs and are not transferred to every workpiece.

Diameter	Length (source unit unstated)	Connection (source notation)	Tip type
2", 4", 6", 8"	~500	1/2 BSP, 11/14 UNC; further connections on request	Zenesis / Zenesis turbo



Zenesis segment: structured diamond arrangement.



Zenesis turbo segment with clearance spaces.



Core-drill view for alumina/SiC substrates and susceptors.



Zenesis core drill for ingots.



Zenesis core drills for sapphire/silicon ingots and ceramic substrates.

Silicon and sapphire wafers: edge profile and groove quality

The tools combine adaptable groove shapes, uniform chamfer width and strong profile retention. Roughing and finishing can be combined in one version. Applications are silicon and sapphire wafer edges. The examples show sapphire and silicon surfaces and the geometric references A1/A2, B1/B2, Ang1/Ang2 and R.

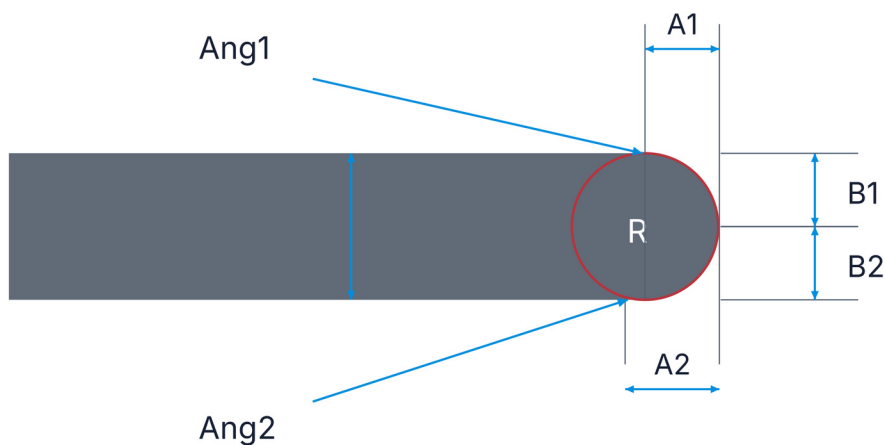
The first programme table contains two groove columns listing 5G and 8G. A further edition lists 8G~10G in the last groove column for MD-1FF6Y. Diameters Ø3.9 and Ø202, thickness 5~20 mm and #325~#3000 remain unchanged. The diameter column has no unit in its heading.

The three charts compare the reference with 1G through 6G using A1/A2, Ang1/Ang2 and R. The numerical axes in the underlying sheet do not state a unit.

Type	Diameter (source unit unstated)	Grooves 1	Thickness [mm]	Grit size	Grooves 2
MD-DW	Ø3.9	5G	5~20	#325~#3000	5G
MD-1FF6Y	Ø202	8G	5~20	#325~#3000	8G

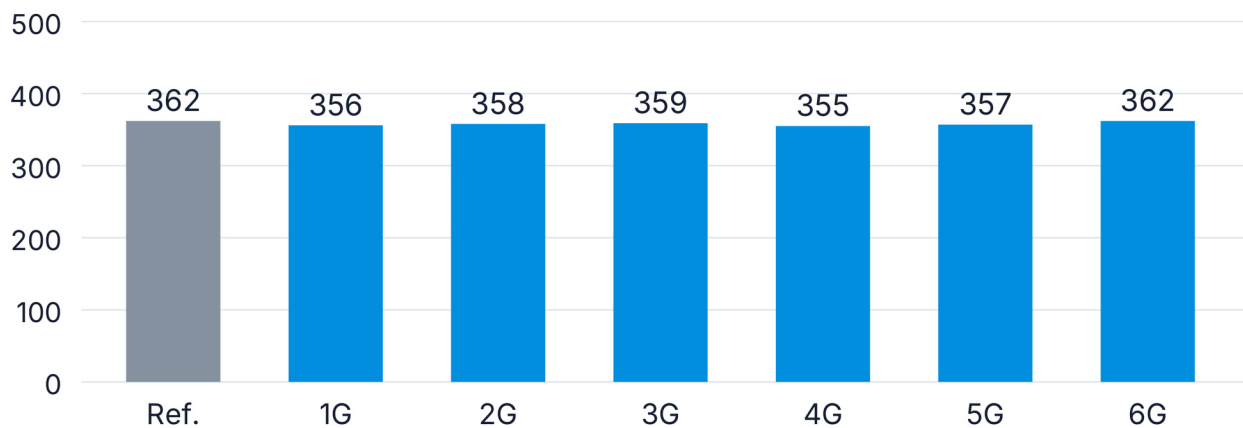
Type	Diameter (source unit unstated)	Grooves 1	Thickness [mm]	Grit size	Grooves 2
MD-DW	Ø3.9	5G	5~20	#325~#3000	5G
MD-1FF6Y	Ø202	8G	5~20	#325~#3000	8G~10G

Wafer edge: A1/A2, B1/B2, Ang1/Ang2 and R



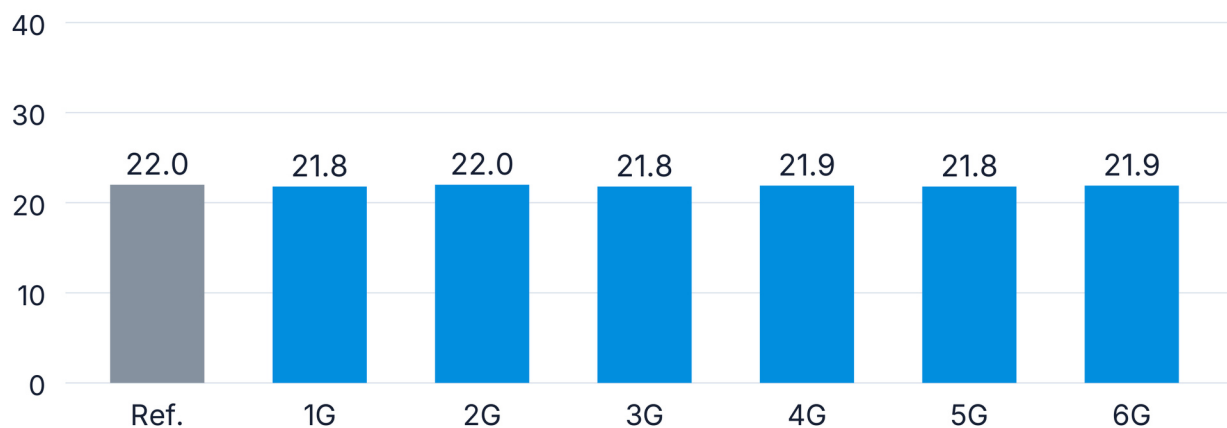
Geometric reference sketch without added dimensions.

Wafer edge with geometric references A1/A2, B1/B2, Ang1/Ang2 and R.

A1/A2: comparison by groove

The source does not state a numerical-axis unit.

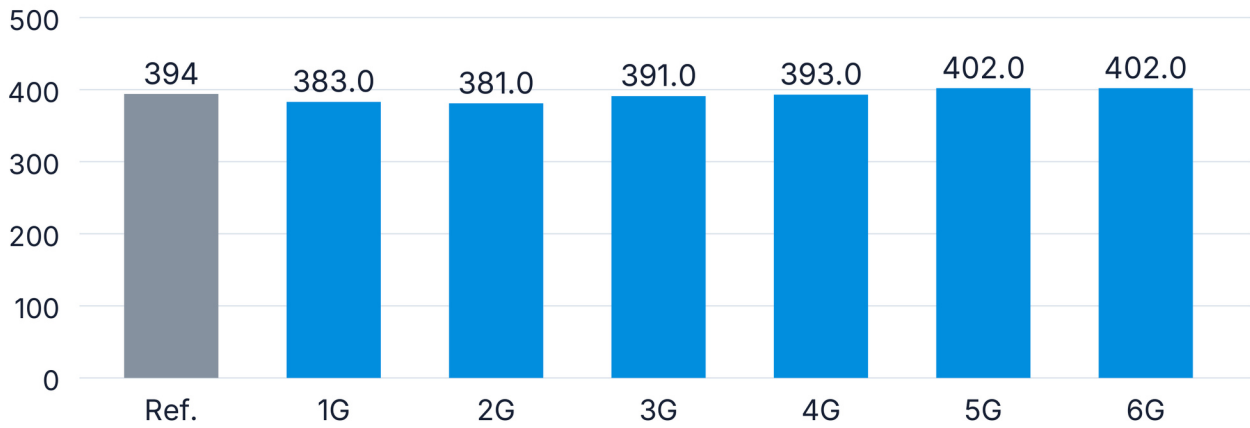
A1/A2: reference and six grooves.

Ang1/Ang2: comparison by groove

The source does not state a numerical-axis unit.

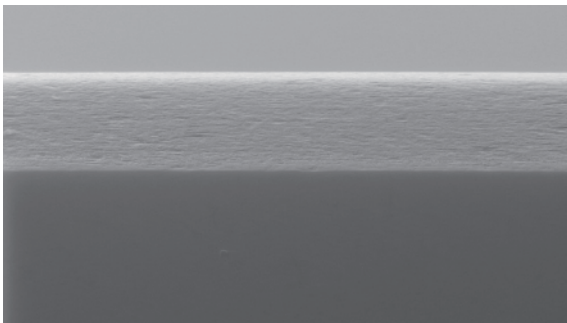
Ang1/Ang2: reference and six grooves.

R: comparison by groove

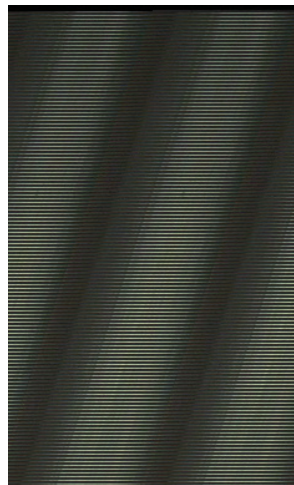


The source does not state a numerical-axis unit.

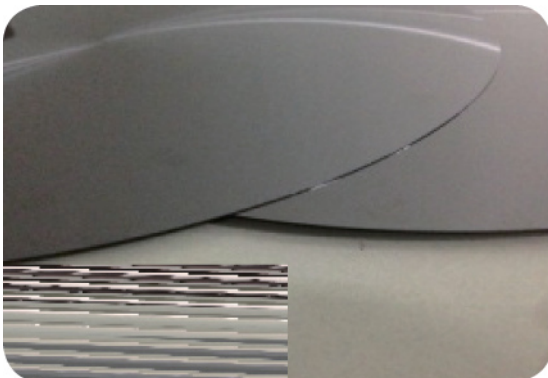
R: reference and six grooves.



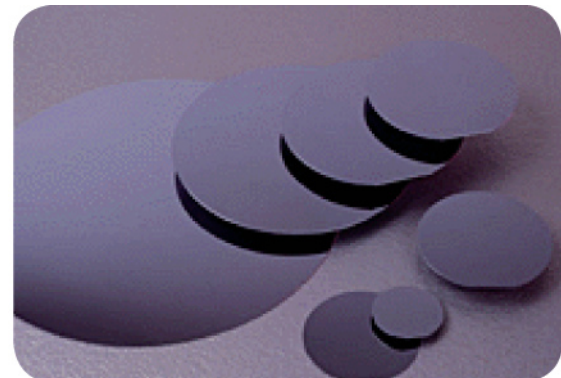
Sapphire edge after machining.



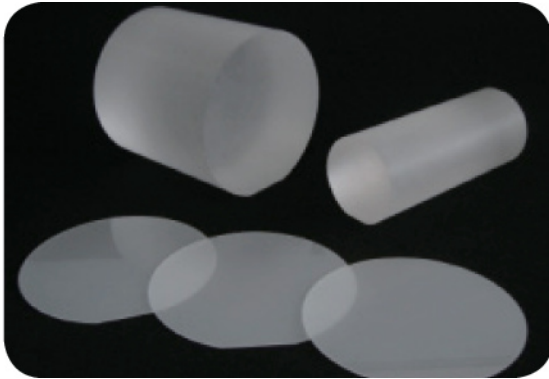
Silicon edge after machining.



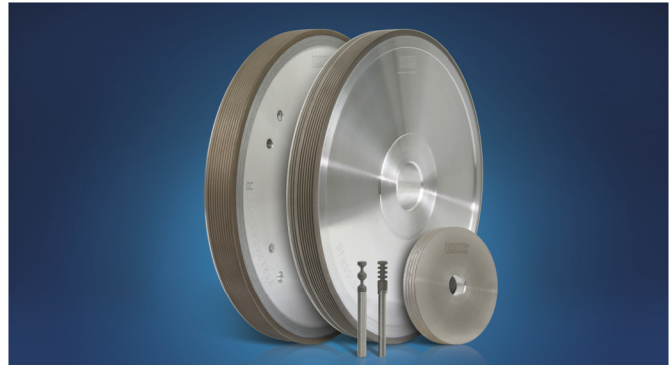
Silicon wafers and wafer edges as application forms.



Wafer stacks and round wafers as application forms.



Ingots and wafers for edge machining.



Edge-grinding wheels and shank tools for silicon and sapphire.

Sapphire, SiC, glass and ceramics: back grinding

Metal-bond rough-grinding tools are designed for long life and high bulk removal. Vitrified fine-grinding tools support grinding performance and fine surfaces. Appropriate wheel designs are offered for different machines, grinding methods and process recipes. Applications include sapphire, SiC, glass and other hard materials such as zirconia.

The eight examples distinguish 2-4" sapphire on WAX, fully automatic 4" sapphire on WAX, 6" sapphire on TAPE and 8" ceramic on TAPE. Comparison figures are ordered reference tool / EHWA. The 6" roughing tool-life values explicitly remain 115 / 97; missing values remain absent rather than zero. The wafer/surface pairs are labelled B/K and No B/K and Ra 970 nm and Ra 857 nm.

Stage	Series	D [mm]	W [mm]	X [mm]	Grit size	Shape
Rough	MX / MS Series	200~300	3~5	3~10	#170~#500	Slant / Segment
Fine	MS / VSP / VSBT Series	200~300	3~5	3~10	#600~#5000	Slant / Segment

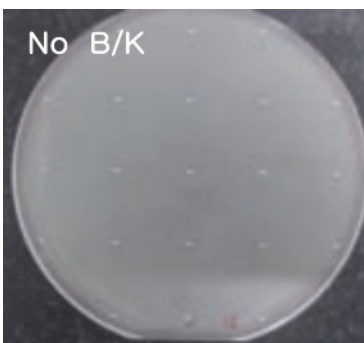
Case	Wafer / mounting	Tool	Feed rate [%]	Tool life [%]	Current [%]
1	2~4" sapphire / WAX	#270-MX	100 / 100	100 / 150	100 / 92
2	2~4" sapphire / WAX	#400-MX	-	100 / 150	100 / 95
3	4" sapphire / WAX / fully automatic	#325-MX16	100 / 167	100 / 143	100 / 94
4	4" sapphire / WAX / fully automatic	#1200-VSP	100 / 125	100 / 200	100 / 95
5	6" sapphire / TAPE / fully automatic	#270-MX	100 / 100	115 / 97	-
6	6" sapphire / TAPE / fully automatic	#1200-VSP	100 / 125	100 / 125	100 / 95
7	8" ceramic / TAPE / fully automatic	#325-MX	100 / 123	100 / 110	100 / 90
8	8" ceramic / TAPE / fully automatic	#1000-MF	100 / 105	100 / 100	100 / 85



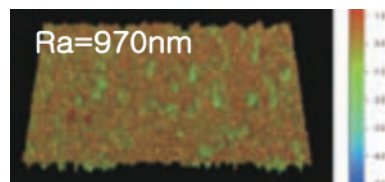
Tool versions in the sapphire programme.



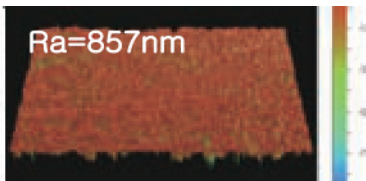
Competitor wafer, source designation B/K.



EHWA wafer, source designation No B/K.



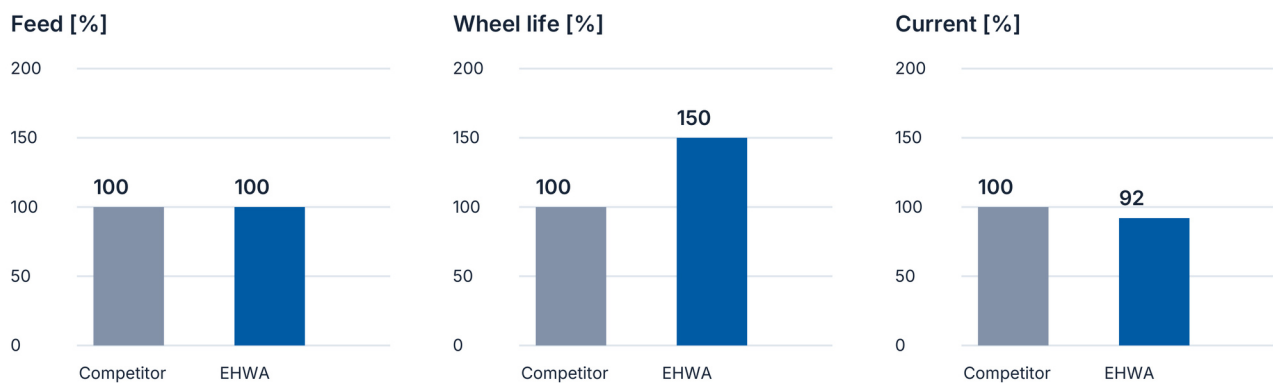
Competitor surface: Ra 970 nm.



EHWA surface: Ra 857 nm.

Application case 1 · #270-MX

Q003 / Q030 · Trial-specific percentages



Reference values unchanged; not a general performance commitment.

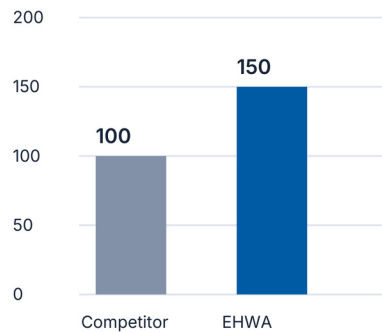
Application example 1: original comparative values, competitor and EHWA.

Application case 2 · #400-MX

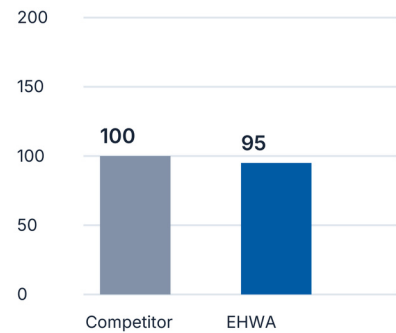
Q003 / Q030 · Trial-specific percentages

No value specified

Wheel life [%]



Current [%]



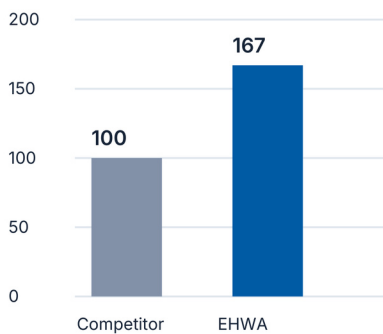
Reference values unchanged; not a general performance commitment.

Application example 2: original comparative values, competitor and EHWA.

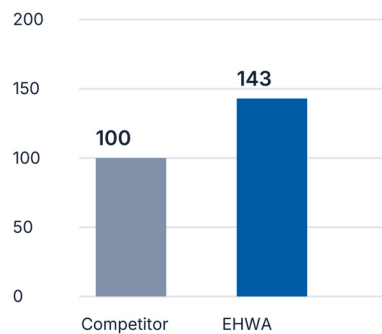
Application case 3 · #325-MX16

Q003 / Q030 · Trial-specific percentages

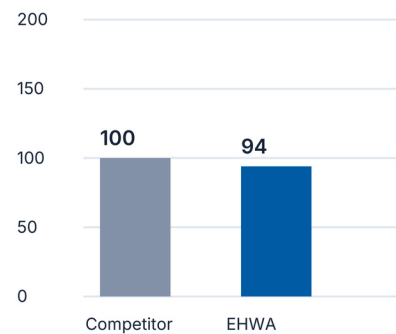
Feed [%]



Wheel life [%]



Current [%]

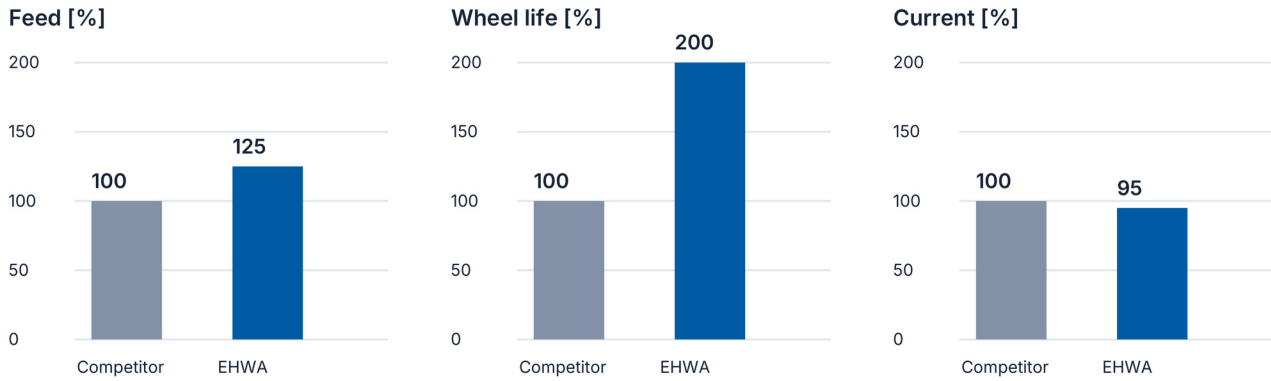


Reference values unchanged; not a general performance commitment.

Application example 3: original comparative values, competitor and EHWA.

Application case 4 · #1200-VSP

Q003 / Q030 · Trial-specific percentages

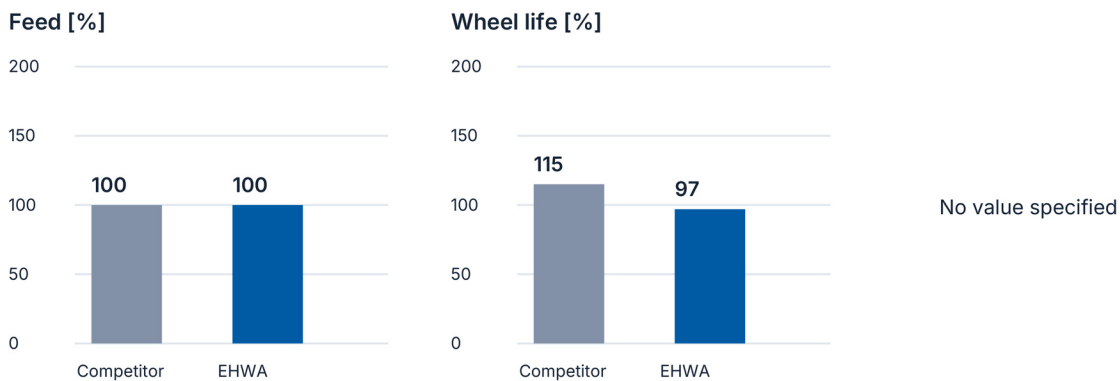


Reference values unchanged; not a general performance commitment.

Application example 4: original comparative values, competitor and EHWA.

Application case 5 · #270-MX

Q003 / Q030 · Trial-specific percentages

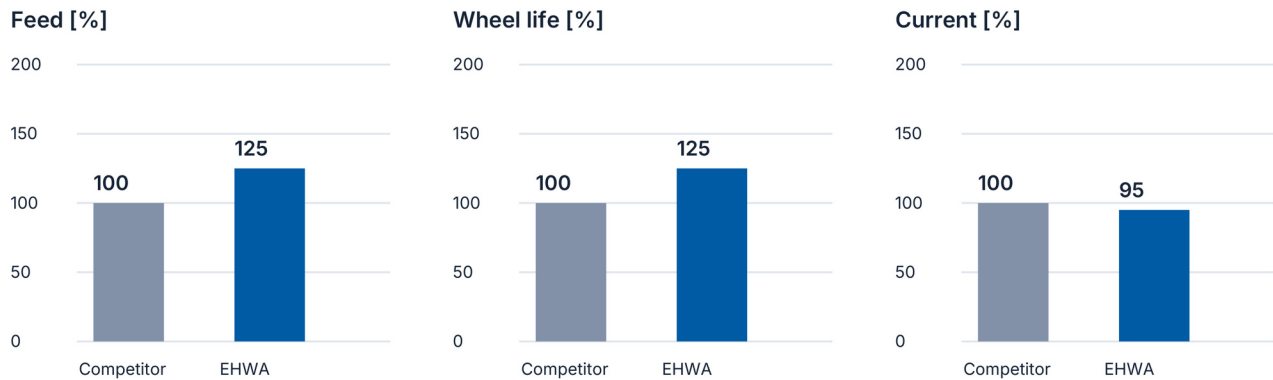


Reference values unchanged; not a general performance commitment.

Application example 5: original comparative values, competitor and EHWA.

Application case 6 · #1200-VSP

Q003 / Q030 · Trial-specific percentages

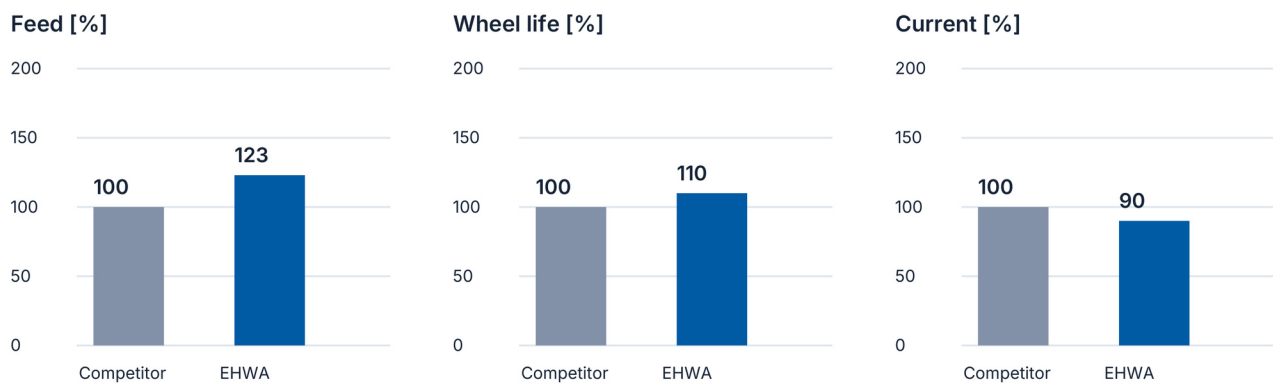


Reference values unchanged; not a general performance commitment.

Application example 6: original comparative values, competitor and EHWA.

Application case 7 · #325-MX

Q003 / Q030 · Trial-specific percentages

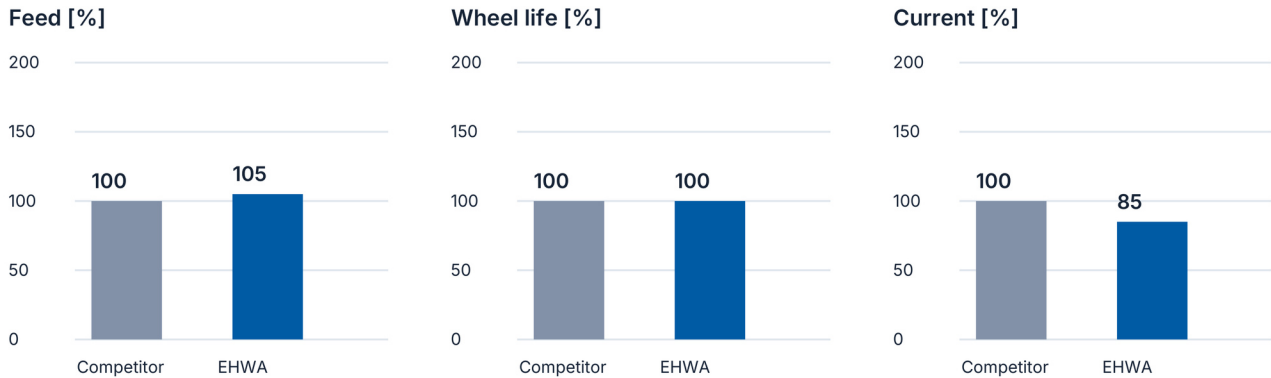


Reference values unchanged; not a general performance commitment.

Application example 7: original comparative values, competitor and EHWA.

Application case 8 · #1000-MF

Q003 / Q030 · Trial-specific percentages



Reference values unchanged; not a general performance commitment.

Application example 8: original comparative values, competitor and EHWA.

Precision diamond wire: cropping, squaring and wafering

PDW combines narrow kerfs with strong cutting quality and throughput. Uniform diamond grit supports thin wafers, flatness and favourable warp, TTV and bow values. Diamond retention and usable wire life are designed for reliable cutting. The sources state 3~10 times faster cutting than their slurry process and a process without abrasive slurry. The comparison depends on material and process; "slurry-free" does not automatically mean machining without cooling.

Cropping covers single-crystal silicon and sapphire ingots. Squaring covers single-crystal silicon, polycrystalline jumbo ingots and sapphire ingots for cover-glass blocks. Wafering covers mono/poly silicon, sapphire and SiC. The silicon sheets mention 50 µm and 120 µm wire versions and application codes 300-D50 and 250-D50 for squaring and 90-D35 for slicing. The 90-D35 application code is not replaced by the different 90-D12 table item.

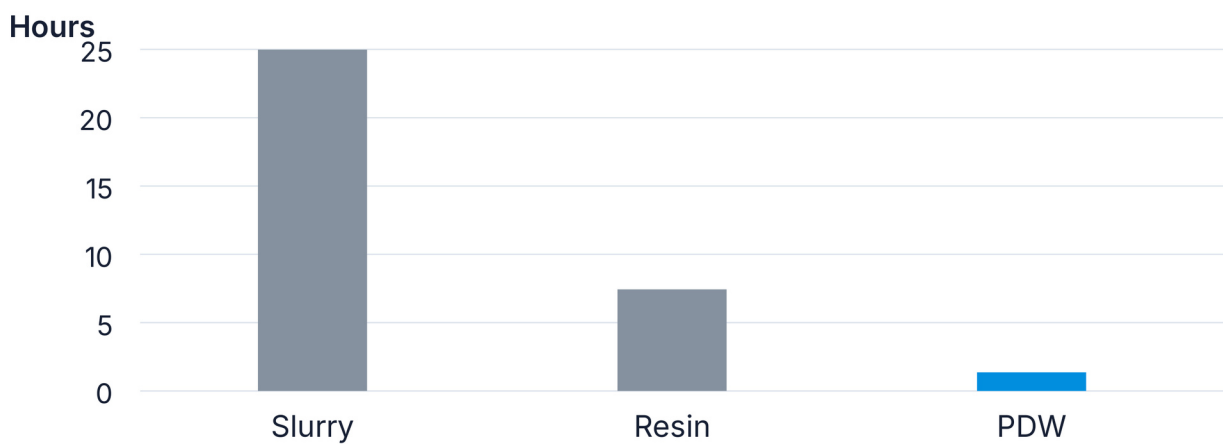
For sapphire, 2", 4" and 6" and expansion to 8" are described. Compared with resin-coated diamond wire, the sources describe improved thermal stability, longer life and shorter cutting time. The different table programmes are retained in full as separate versions.

Diamond wire and slurry: kerf principle



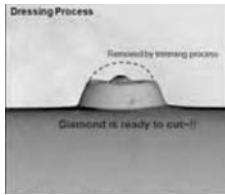
PDW and slurry kerf comparison.

Process-time comparison in the diamond-wire sheet

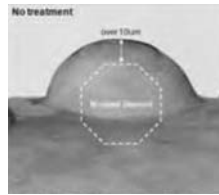


Source bar geometry; no additional individual values.

Process-time comparison with unchanged source geometry.



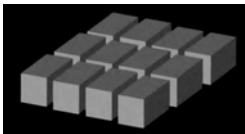
After dressing: indicated removal and exposed diamond.



Before dressing: image labelled protrusion 10 µm.



Precision diamond wire on spools.



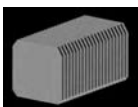
Squaring: block shapes for silicon and sapphire.



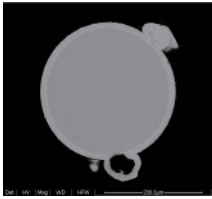
Cropping: sections of an ingot.



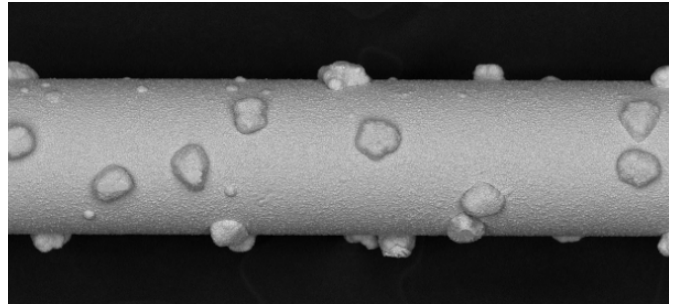
Wafering: slices from a round ingot.



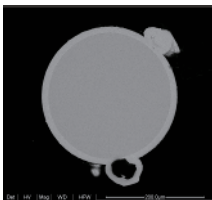
Wafering: slices from a block-shaped ingot.



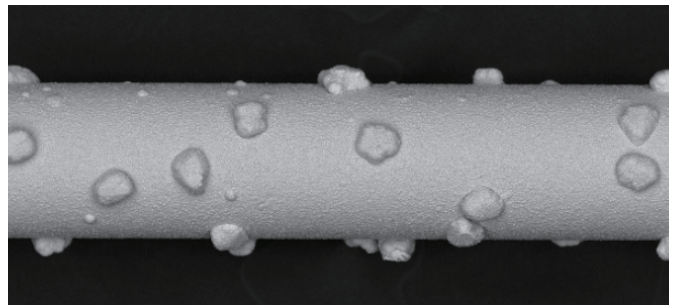
Diamond-wire cross-section with the complete 200-μm scale.



Diamond-coated wire: side view.



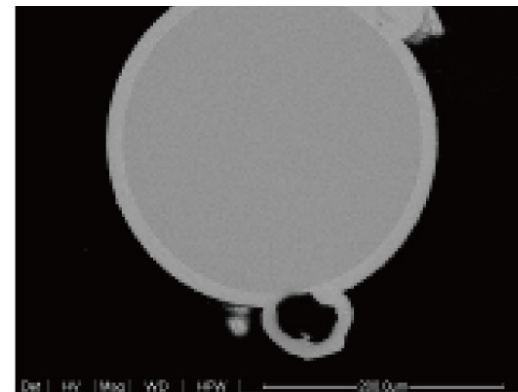
Diamond-wire cross-section with its source scale.



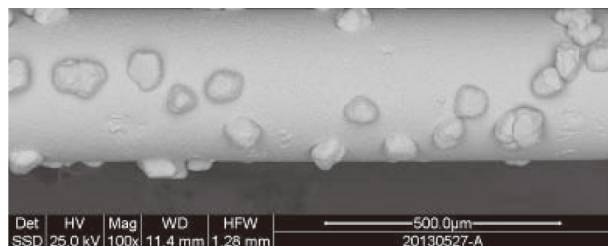
Diamond-coated wire with the complete 500-μm scale.



Precision diamond wire on two spools.



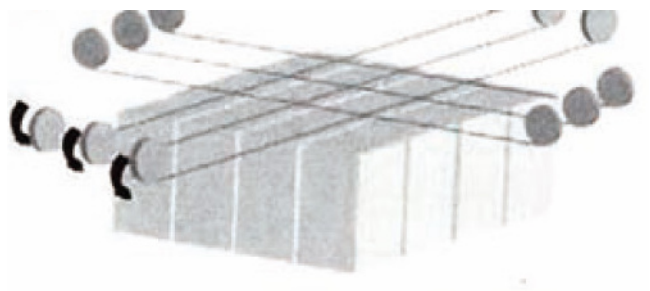
Diamond-wire cross-section with its source scale.



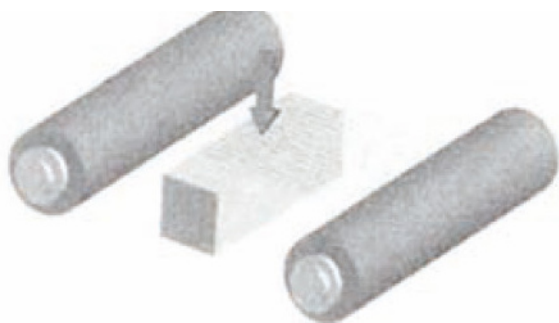
Side view of diamond-coated wire with its source scale.



Precision diamond wire: spool view in the product presentation.



Squaring: wire path and workpiece arrangement with rollers.



Slicing: wire path at the ingot between two rollers.

Diamond wire: three complete programme versions

The programmes differ not only in additional thin wires but also in order codes, wire core, WBS and kerf loss. WBS means wire breaking strength. The core material is high-quality piano wire. Low, medium and high diamond concentrations and spool lengths of 5, 10, 20, 30, 50 and +100 km are described; customer-specific versions are available.

The nine-row programme contains 80-D10 and 250-D45, 300-D45 and 350-D45. For 350-D45, the source diameter column states 300; this differing source statement remains visible and is checked against the specification during selection. The expanded thirteen-row programme adds 50-D-9 and 60-D-10; the differing hyphen patterns remain part of the order designations.

Application	Order code	Core-wire Ø [μm]	WBS [N]	Diamond size [μm]	Kerf loss [μm]
Mono-/poly-Si wafering	70-D10	70	18	8~12	80~90
Mono-/poly-Si wafering	80-D12	80	21	8~16	90~100
Mono-/poly-Si wafering	90-D12	90	23	8~16	100~110
Mono-/poly-Si wafering	120-D15	120	40	10~20	140~145
Sapphire-ingot wafering	160-D35	160	65	30~40	220~240
Sapphire-ingot wafering	180-D35	180	85	30~40	235~255
Sapphire-ingot wafering	180-D45	180	85	40~50	245~255
Si squaring / sapphire cropping	200-D35	200	110	30~40	260~280
Si squaring / sapphire cropping	250-D35	250	180	30~40	310~330
Si squaring / sapphire cropping	250-D50	250	180	40~60	340~360
Si squaring / sapphire cropping	300-D50	300	240	40~60	390~410

Application	Order code	Core-wire Ø [μm]	WBS [N]	Diamond size [μm]	Kerf loss [μm]
Mono-/poly-Si wafering	60-D10	60	12	6~12	75~85
Mono-/poly-Si wafering	70-D10	70	16	8~12	85~95
Mono-/poly-Si wafering	80-D10	80	20	8~12	90~100
Sapphire-ingot wafering	160-D35	160	65	30~40	220~240
Sapphire-ingot wafering	180-D35	180	85	30~40	235~255
Sapphire-ingot wafering	180-D45	180	85	40~50	245~255
Si squaring / sapphire cropping	250-D45	250	180	40~50	345~355
Si squaring / sapphire cropping	300-D45	300	240	40~50	395~405
Si squaring / sapphire cropping	350-D45	300	320	40~50	445~455

Application	Order code	Core-wire Ø [μm]	WBS [N]	Diamond size [μm]	Kerf loss [μm]
Mono-/poly-Si wafering	50-D-9	50	10	5~10	60~70
Mono-/poly-Si wafering	60-D-10	60	12	6~12	70~80
Mono-/poly-Si wafering	70-D10	70	18	8~12	80~90
Mono-/poly-Si wafering	80-D12	80	21	8~16	90~100
Mono-/poly-Si wafering	90-D12	90	23	8~16	100~110

Application	Order code	Core-wire Ø [μm]	WBS [N]	Diamond size [μm]	Kerf loss [μm]
Mono-/poly-Si wafering	120-D15	120	40	10~20	140~145
Sapphire-ingot wafering	160-D35	160	65	30~40	220~240
Sapphire-ingot wafering	180-D35	180	85	30~40	235~255
Sapphire-ingot wafering	180-D45	180	85	40~50	245~255
Si squaring / sapphire cropping	200-D35	200	110	30~40	260~280
Si squaring / sapphire cropping	250-D35	250	180	30~40	310~330
Si squaring / sapphire cropping	250-D50	250	180	40~60	340~360
Si squaring / sapphire cropping	300-D50	300	240	40~60	390~410

Diamond-wire production, dressing and process control

The production sequence starts with raw wire and pre-treatment. Strike electroplating and electroplating with Ni-coated diamond follow, then electroplating for retention, dressing, inspection and packaging. Real-time counting and inline inspection support process control.

The structural illustration carries 180-D35 μm, a lower layer <1 μm, an upper layer 10~13 μm, diamond 30/40 μm and Ni coating 400~600 nm. These labels refer to the illustrated structure. The before/after dressing images show a 10 μm protrusion before dressing and the indicated material removal to prepare the diamond for cutting.

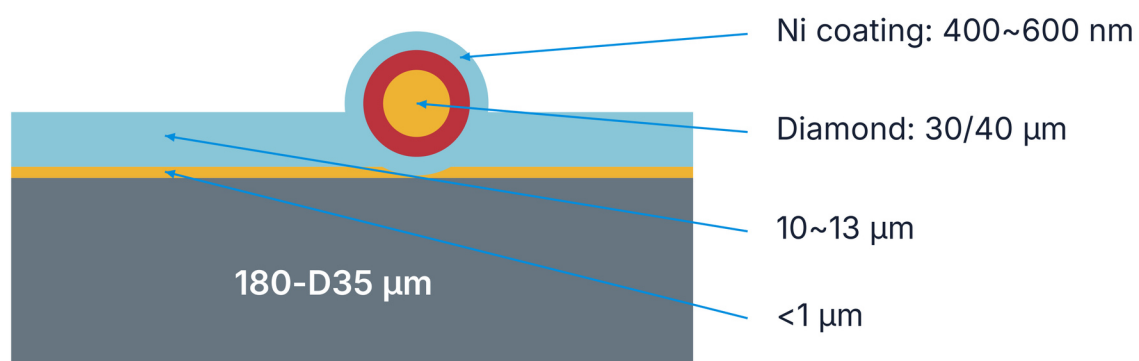
Label	Source value
Wire designation	180-D35 μm
Lower layer	<1 μm
Upper layer	10~13 μm
Diamond	30/40 μm
Ni coating	400~600 nm

PDW: manufacture, dressing and inspection



Production steps from raw wire to packaging.

PDW: wire and diamond coating



Labels and layer relationships from the illustrated structure.

Wire layers, diamond and Ni coating in the illustrated structure.



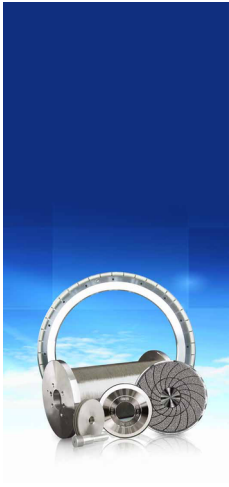
Inline inspection and real-time counting during diamond-wire production.

Additional semiconductor machining: back grinding, dicing and CMP

The industry brochure extends the glass programme with silicon back grinding and LED/sapphire back grinding. Low edge chipping, die strength, high feed rates and thin wafers are design targets. For dicing and microblades it lists silicon, LT/LN, glass, ceramics and QFN, FBGA, CSP and MCP: fine cuts, low chipping, precision with thin blades, and high rotational speeds and feeds.

BSL CMP conditioners combine precision diamond placement and protrusion control with strong brazed attachment. Diamond selection and quality control support low defects and uniform wafer processing. CVD conditioners are designed for stable pad and wafer removal over longer use, low consumption and reduced maintenance time. The source describes a chemically stable contact solution intended to minimise metal contamination; this does not replace contamination qualification for each slurry/pad system.

Version	Manufacturer	Listed machines
BSL	AMAT	Mirra / Reflexion
BSL	Ebara	F-Rex200/300 / EPO-222(H)
BSL	Lam	Auriga / CMP200/300 / Avantgard 776(676) / Momentum / Teres
BSL	Strasbaugh	6DS+SP / 6ED
CVD	AMAT	Reflexion LK / Mirra
CVD	Ebara	F-REX series
CVD	K.C.T.	Source lists no model



Diamond-tool programme for semiconductor, display, solar and LED.



BSL CMP conditioners with a structured diamond coating.



CVD CMP conditioners.



Back-grinding wheels for silicon wafers.



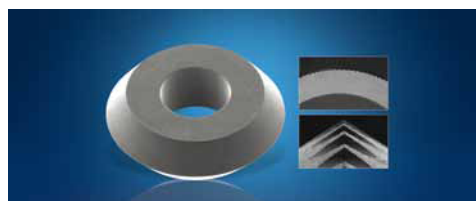
Back-grinding wheels for LED/sapphire wafers.



Metal-bond edge tools for display glass.



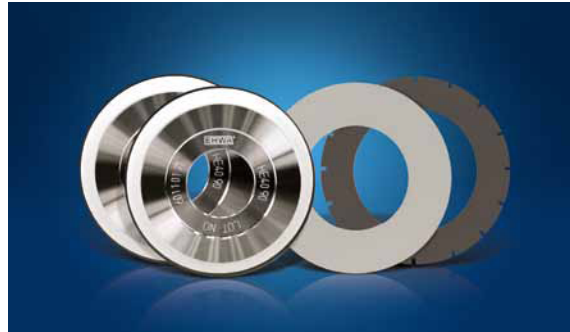
Edge-polishing wheels for mobile LCD and OLED panels.



Scribing wheel with cutting-edge details.



Precision diamond wire on spools.



Dicing blades and microblades.



Electroplated edge-grinding tools.

Technical support and company background

Since 1975, EHWA has developed diamond tools and technical solutions with customers. Product quality, service and expertise are central. The industry brochure describes the aim of equipping customers with suitable products and technical information and supporting their manufacturing success. EHWA Europe is your contact for designing and coordinating your current application.

The following location photographs come from the 2016 brochure. They document the company background at that time: Osan HQ, Osan 2, Dongtan, Pyeongtaek, Seochun and Oksan; Shanghai, Weihai, Fujian and Indonesia; and branches in the USA, Japan, Thailand, Germany, India and Mexico. The historical photographs are not a current location directory.



Osan HQ: location photograph from the 2016 brochure.



Dongtan: location photograph from the 2016 brochure.



Seochun: location photograph from the 2016 brochure.



Shanghai: location photograph from the 2016 brochure.



Fujian: location photograph from the 2016 brochure.



U.S.A.: location photograph from the 2016 brochure.



Thailand: location photograph from the 2016 brochure.



India: location photograph from the 2016 brochure.



Osan 2: location photograph from the 2016 brochure.



Pyeongtaek: location photograph from the 2016 brochure.



Oksan: location photograph from the 2016 brochure.



Weihai: location photograph from the 2016 brochure.



Indonesia: location photograph from the 2016 brochure.



Japan: location photograph from the 2016 brochure.



Germany: location photograph from the 2016 brochure.



Mexico: location photograph from the 2016 brochure.

Discuss your application with EHWA

Tell us your material and workpiece, glass or wafer thickness, machine and mounting, process stage and required edge or surface quality. For diamond wire, also provide the cutting operation, ingot size, wire core, concentration and required spool length. EHWA Europe supports suitable tool and process selection.

[EHWA Europe · Technical enquiry](#)

Documents and source mapping

The complete family edition is based on 38 distinct PDF documents with 96 physical pages. Q107 and Q108 are recorded as an identical duplicate in the manufacturer index and are used once. Identical pages are presented with all provenance retained; technical versions keep their own programmes and test details.

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- Q009 · 2 pages
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- Q015 · 1 page
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- [Q209](#) · 6 pages
- [Q210](#) · 2 pages
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