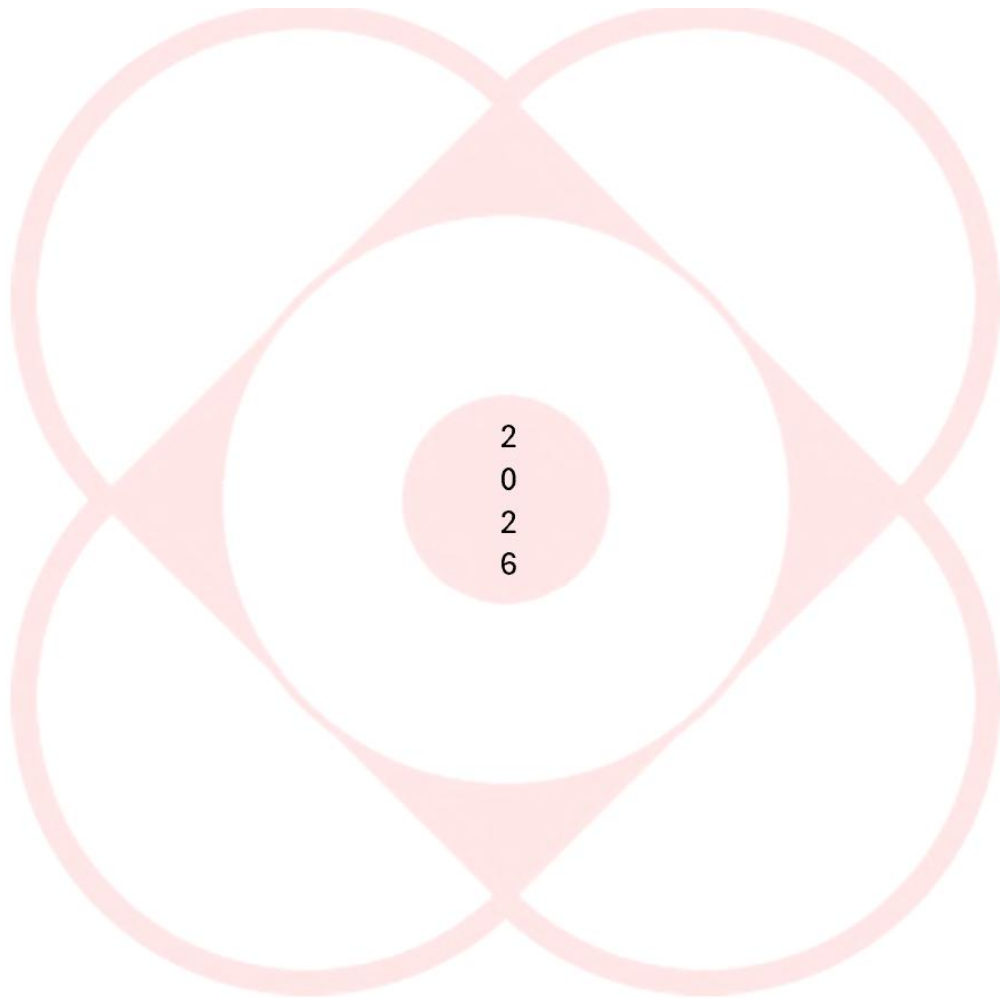




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ULTRA PRECISION CNC EQUIPMENT FOR THE PRODUCTION OF SEMICONDUCTORS, PHOTONICS & OPTICS



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Wacom Corporation





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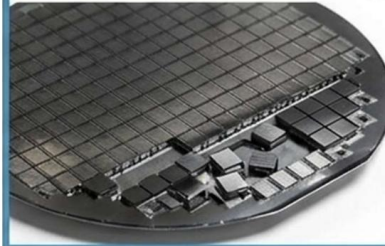
USM-20B(H) NANO SERIES DICING MACHINE

SHIBAURA Nano Precision Dicing Saw

Purpose-built to cut hard & brittle materials such as tungsten carbide, SiC, ceramics, and Vespel at sub-micron accuracy without sacrificing production throughput.



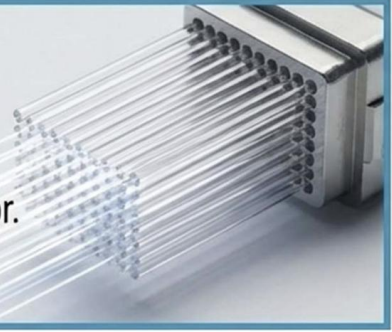
Semiconductors



SiC Power Devices.
High wear dicing.

Photonics

Quartz/Pyrex
Fiber Arrays.
48 grooves/connector.



KEY FEATURES

- Aerostatic bearing spindle: zero physical contact eliminates asynchronous runout, with high rigidity at 20,000 or optional 40,000 min^{-1}
- Linear motor direct-drive Y-axis eliminates backlash (10 nanometer resolution)
- in-cycle Electric Discharge Truing (EDT): non-contact process continuously exposes fresh diamond abrasive for a self-correcting blade edge
- Multi-blade simultaneous processing; plane, rough, and finish cuts in a single pass, drastically cutting cycle time
- Closed-loop workflow: in-machine camera measurement compares actual cut to the DXF file and auto-generates a compensated NC program

PROVEN ON TUNGSTEN CARBIDE (HRA92)

- $\pm 0.2 \mu\text{m}$ pitch accuracy, where standard grinding causes chipping and rapid tool wear
- Zero chipping with a $60^\circ \pm 0.05^\circ$ groove angle held to $59.85^\circ - 60.07^\circ$

ENGINEERED FOR

Photonics	Quartz / Pyrex fiber arrays — up to 48 grooves per connector
Semiconductors	SiC power device dicing (high-wear applications)
Medical / Sensor	PZT piezoelectric elements prone to chipping
Advanced Resins	Vespel components requiring fly-cutting capability





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UVM NANO SERIES CNC MILLS

SHIBAURA Nano Precision Machining Center

Simultaneous 5-axis ultra-precision mold and micro-part machining. Engineered for smartphone, automotive lighting, and optical connector molds where surface finish and form accuracy define product quality.



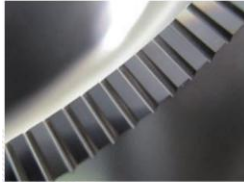
UVM-700E(5AD)

High quality machining

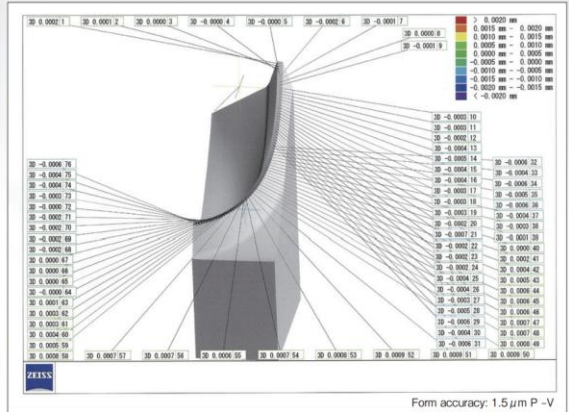
Machining example: Component mold for automobile light



Machine tool: UVM-700E (5AD)



Surface roughness: 0.025 μm Ra



Material	STAVAX HRC52
Cutter for finishing	R0.05 cBN ball end mill
Tool rotation speed	60,000 min^{-1}
Machining time	42 hours 30 minutes

KEY FEATURES

- Proprietary aerostatic bearing spindle delivers tool rotation up to 60,000 min^{-1} with exceptional rotational accuracy
- High precision linear motor technology enables rapid, backlash-free positioning
- Thermally stable coolant system within $\pm 0.1^\circ\text{C}$ maintains machine tolerance during long runs
- Optional fine temperature-controlled booth cover ($\pm 0.01^\circ\text{C}$) for long runs and fine-pitch finishing
- UVM-TSA support software: tool management, built-in touch-probe measurement system, and remote CNC monitoring
- UVM-700E(5AD) “flagship” model adds simultaneous 5-axis machining with 200 kg load capacity

PROVEN RESULTS

- 0.79 μm (0.000031”) roundness and ± 0.001 mm (0.000039”) hole positioning accuracy on continuous micro-drilling
- 0.025 μm Ra surface finish achievable on hardened mold steel (STAVAX HRC52)

MODEL LINEUP AT A GLANCE

Model	Best For
UVM-450C(H)	Standard 3-axis model of the UVM series
UVM-450D(H)	Upgraded 3-axis model for high speed & high precision
UVM-700C(H)	Long-stroke 3-axis model for large-sized workpieces
UVM-700E(5AD)	Flagship model with simultaneous 5-axis positioning for large, complex parts





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UFG-150D(PV) POLYGON MIRROR SERIES

SHIBAURA Nano Precision Polygon Mirror Processing Machine

Built with the purpose of delivering ultra-precision fly-cut machining of polygon mirrors in copper, aluminum, and other soft metals using single-crystal diamond tooling.



KEY FEATURES

- High-precision aerostatic bearings in both the cutter spindle and indexing table deliver high-speed rotation, low heat generation, and exceptional rotational accuracy
- Ultra precision Double-V hydrodynamic guideways on the X-axis, supporting the table and providing ultra-smooth, high-rigidity continuous motion
- Mirror-quality surface finishes with high volume throughput for production environments
- FANUC Series 32i-B Plus control for proven reliability

WHY IT MATTERS

- Minimum adjustment of 0.00001 mm (linear) and 0.0001° (0.36 sec) rotary, is among the finest resolutions available
- Unlimited B-axis workpiece indexing travel supports 4-, 5-, and 6+ sided polygon mirrors

MAIN SPECIFICATIONS

Max. diameter (4 / 5 / 6+ sided)	140 mm / 150 mm / 150 mm
Max. thickness	100 mm
X / Z-axis travel	200 mm / 100 mm
Spindle speed	300 – 4,000 min ⁻¹
Fast forward speed (X, Z / B-axis)	2 m/min / 1,250 deg/min





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GMP SERIES MOLDING PRESS FOR OPTICS

SHIBAURA High-Precision Optical Glass Molding Press

Heats, presses, and molds optical glass and quartz glass directly into finished lens geometry, replacing traditional grinding and polishing steps with a single highly-repeatable molding process.



KEY FEATURES

- Minimizes the traditional grinding and polishing process by molding optical elements directly to final form
- Choice of die-molding single system or die-molding transfer system, customized to your production process
- Uniform, high-speed infrared lamp heating system delivers excellent temperature control and part to part quality
- Designed for small to large-aperture optics, up to 150 mm maximum diameter, and a high-temperature model for fused silica
- Optional Auto Loader enables fully automatic operation for glass materials and molded parts

MOLDING EXAMPLES

Ball lenses, aspheric lenses, meniscus lenses, micro-lens arrays, and precision flats & prisms.



PLATFORM SNAPSHOT

Model	Best For
GMP-311V / 315VW / 0204V	Die-molding fix system, single & large-diameter lens molding, up to 150 mm option
GMP-32-7S / 54-7S	Die-molding transfer system, high-volume small/medium lens mass production
GMP-310V-3R	Die-molding transfer system, medium/large-diameter lens mass production





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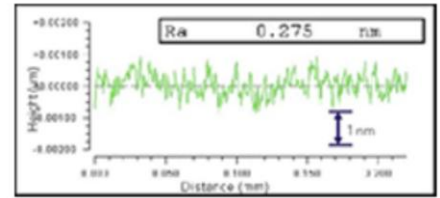
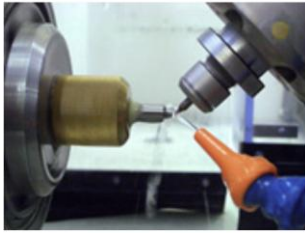
ULG SERIES GRINDERS FOR OPTICS

SHIBAURA High Precision Aspheric & Free-form Grinder

Turns and grinds spherical, aspheric, and free-form surfaces and molds, with high efficiency and high precision. Optimized machine structures deliver strong cost performance across the ULC, ULG, and LG-100 model lines.

Slant Spindle Grinding

Φ5mm aspherical lens mold



Surface roughness : **Ra 0.275 nm** $\approx$ Ra 0.0108 μ in which is not possible using standard grinder

KEY FEATURES

- High-precision spindles (grinding & work) achieve high speed, high rigidity, low heat generation, and ultra precise run-out.
- Porous-restrictor aerostatic bearings cut air consumption to roughly 1/6 of conventional designs while holding a stable, high quality surface finish
- High precision V-V roller guideway (non-circular system) delivers nanometer-range feed response with no reversal delay, greater rigidity and stability than hydrostatic/aerostatic guideways with similar accuracy
- No static guideway fluid temperature fluctuation, and no hydraulic unit required, contributing to space savings and energy efficiency
- Axis drives optimally paired per machine type: ball-screw drive with proprietary anti-vibration couplings, or linear motor drive for rapid axes movements

APPLICATIONS

- Turning and grinding of spherical, aspheric, and free-form lenses
- Precision machining of molds that produce optical elements
- LG-100 Series handles rough / semi-finish pre-processing ahead of final ULG finishing

MODEL LINEUP AT A GLANCE

Model	Best For
ULC-100D(S) / ULC-100F(S)	Turning machine, symmetric aspheric turning, optional C-axis
ULG-100E(HY) / 100D(HYS/HYB)	Turning & grinding, grinding spindle speed up to 80,000 min ⁻¹
ULG-100D(H3) / 100D(5A)	Free-form turning & 5-axis grinding (X, Y, Z, B, C)
LG-100 Series	Pre-process rough / semi-finish grinder to prep for ULG





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CNC SERIES SURFACE GRINDERS

AMADA High Precision CNC Surface, Profile, and Rotary Grinders

Four grinder platforms covering profile, form, and rotary surface grinding, engineered by Amada Machinery for straightness, thermal stability, and repeatable sub-micron form accuracy.



Digital Profile Grinder

Digital Profile Grinder (DPG150)

Industry-first digital measurement: a 4K on-screen profile display and 1 μm digital gauging let any operator hit ultra-precision results, straight from CAD data.



High Precision Forming Grinders

High Precision Forming Grinders (MEISTER 52 / 45)

Proprietary hydraulic-servo table reciprocation up to 250 min^{-1} , a $0.05 \mu\text{m}$ linear-scale vertical axis, and a full thermal-insulating cover for saddle-type surface & form grinding.



Rotary Surface Grinders

Rotary Surface Grinders (SSR-6)

All-electric CNC rotary grinder delivering up to 3x the productivity of a reciprocating surface grinder, with constant-surface-speed control and automatic wheel dressing & compensation.



Ultra High Precision Forming Grinders

Ultra Precision Forming Grinders (WINSTAR / WINSTAR SP)

Three-face standalone column and V-V slideways without overhang hold long-term straightness; an ultra-low-vibration oil-cooled spindle delivers mirror finishes, with CCD on-machine measurement on WINSTAR SP.





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DBSAW SERIES DIAMOND TIPPED DRESSABLE BANDSAWS

AMADA High-Precision Diamond Bandsaws for non-ferrous, hard, abrasive and brittle Semiconductor Material

Two CNC Bandsaw platforms for hard and brittle non-ferrous material, engineered by Amada Machinery for perfect slicing

Diamond band saw machine

DBSAW 500

Cutting Capacity (WxHxD): 500x500x500



Diamond band saw machine

DBSAW 1000

Cutting capacity (WxHxD): 1300 x 1300 x 1000



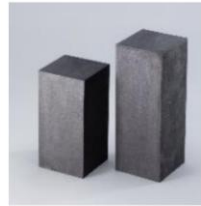
Quartz glass



Ceramics



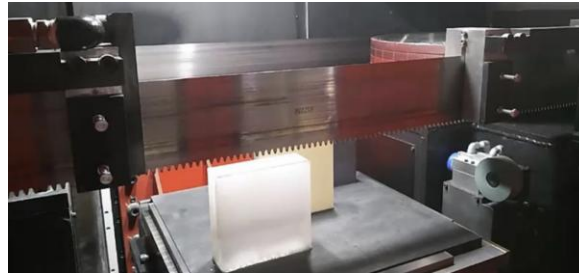
Silicon



Carbon



Sapphire



KEY FEATURES

- Fastest CNC bandsaw on the market with maximum speed of 1500 m/min (4920 ft/min)
- 3-4 times better productivity compared with other bandsaws by using redressable diamond tipped sawblades
- Highest-quality surface finish, perfect squareness, able to slice hard and brittle material as thin as 1.5 mm and as large of a diameter as 1.3 m

MAIN SPECIFICATIONS

Main Specifications	DBSAW 500	DBSAW 1000
Max. Workpiece Size	500 x 500 x 500 mm	1300 x 1300 x 1000 mm
Blade Traveling Speed	200–1500 m/min	200–1500 m/min
Blade Size	125 x 0.8 x 5410 mm	155 x 1.25 x 9730 mm
Machine Dimensions	2900 x 2235 x 2225 mm	4800 x 4866 x 3480 mm
Machine Weight	5000 Kg	25000 Kg

