

Solid PCD Micro Drill

- Suitable for drilling hard-brittle materials, effectively reducing chipping
- Hole quality **up by 3 times** vs. conventional cutters in machining **CFRP**
- Successful breakthrough in machining ultra-deep micro-hole with Depth-Diameter **Ratio of 55:1** in single crystal silicon workpiece



Solid PCD Thread Mill

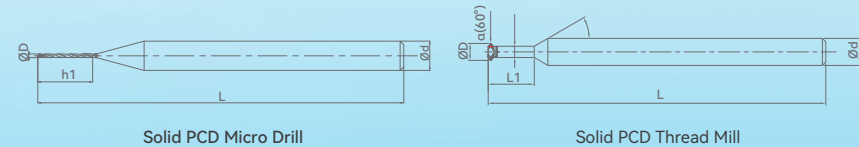
- Conprofe Solid PCD Drill - best fit for hard-brittle materials threading
- Thread milling efficiency **up by 100%** vs. traditional thread mills, with machining cost per hole reduced by more than **2 times**
- Tool life **up by 50~100 times** vs. traditional thread mills
- Customized specifications of micro-diameter thread mills available



Solid PCD Micro Drill

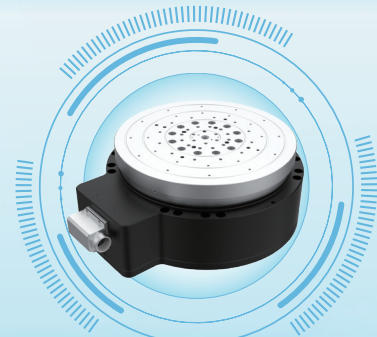
Solid PCD Thread Mill

Cutting Edge Diameter (D)	Cutting Edge Length (h1)	Overall Length (L)	Shank Diameter (d)	Spec.	Cutting Edge Diameter (D)	Thread Angle (α)	Reference Pitch	Neck Diameter (d2)	Neck Length (L1)	Neck Angle (r)	No. of Cutting Edges	Overall Length (L)	Shank Diameter (d)
0.45	7.5	40	4	M2.5	1.95	60°	0.45	1.28	6.5	15°	4	45	4
0.5	7.5	40	4	M3.0	2.36	60°	0.5	1.63	7.5	15°	4	45	4
0.6	9	40	4	M4.0	3.19	60°	0.7	2.15	9.5	15°	4	50	4
0.8	12	40	4	M5.0	3.97	60°	0.8	2.86	10	15°	4	50	6
1.0	15	45	4	M6.0	4.9	60°	1.0	3.38	15	15°	3	60	6
1.1	16.5	45	4	M8.0	6.0	60°	1.75	4	15	15°	4	50	8
1.2	18	45	4	M10	7.95	60°	1.75	5.63	15	15°	4	60	10
1.3	19.5	45	4	M12	9.95	60°	1.75	7.3	15	15°	4	65	10
1.4	21	50	4										
1.5	22.5	50	4										
1.8	27	60	4										
2.0	30	60	4										



Vertical DDR Rotary Table

- **High Speed:** Max. 1,500rpm
- High Precision: **No backlash**, standard 26-bit encoder
- Mill-Turn: for both **milling** and **high-speed turning**
- High Load Capacity: Max. load of **80KG**
- Built-in Air Path: **Built-in positive labyrinth, fixture positive pressure** and **vacuum air paths**, with aesthetic look that avoids tube folding or air holding during high-speed rotation
- Compatible with Fanuc, Siemens, Mitsubishi, Brother and other CNC controllers



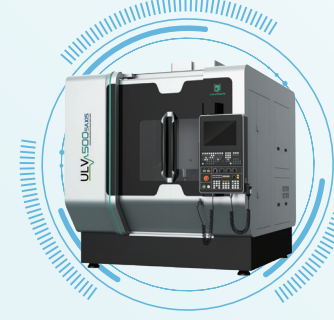
Ultrasonic Engraving and Milling Center

- Intelligent **Ultrasonic Machining System** developed by Conprofe to tackle the challenges in machining hard-to-cut materials
- Various kinds of screw guide protection available to meet machining needs of hard-brittle materials and metals
- Single tool magazine / extended tool magazine available
- Optional spindle speed with max. speed of 40,000rpm
- Full closed loop control with high-precision linear encoders, positioning accuracy of **5μm**, repeatability of **3μm**
- High precision probe for on-machine measurement function
- With centrifugal filtration, bag and other multi-stage filtration system



Ultrasonic Vertical 5-Axis Machining Center

- Intelligent **Ultrasonic Machining System** developed by Conprofe to tackle the challenges in machining hard-to-cut materials
- Bridge gantry structure, low center of gravity, short overhang and super high rigidity for lower thermal strain
- Full closed loop control with linear encoders
- Equipped with high power, torque and speed ultrasonic spindle
- Various chain-type tool magazine capacity options: 24~120 tools
- Automatic fire suppression system configured to reduce the risk of machining flammable and explosive materials
- Siemens 840D sl and SINUMERIK ONE 5-axis simultaneous control systems available



Ultrasonic Graphite Machining Center

- Intelligent **Ultrasonic Machining System** developed by Conprofe to tackle the challenges in machining hard-to-cut materials
- Multi-layered protection with labyrinth design, positive pressure sealing and special dust collector design
- Superior performance in vibration damping, accuracy retention, dynamic characteristics and thermal stability due to its high-rigidity bed casting and symmetrical gantry structure
- Full closed loop control with high-precision linear encoders to ensure repeatability accuracy of **2μm**
- Equipped with high-volume, high-power stand-alone filter cartridge dust collector
- Optional handheld vacuum cleaner with mobile operation for more thorough vacuuming



Conprofe Technology Group Co., Ltd.

Website: www.conprofecnc.com
 E-mail: sales-international@conprofetech.com
 Tel: +86-20 3861 9084
 Address: No.6, 2nd Nanyun Road, Science City, Hi-tech Development Zone, Guangzhou, 510663, P.R.C

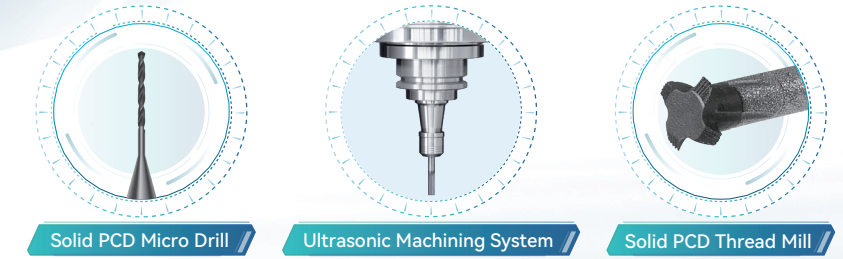


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Semiconductor Industry

Conprofe Ultrasonic Machining Solutions



Converging of Global Resources, Professional as Industry Leader

Quartz Glass Showerhead Drilling

Challenges

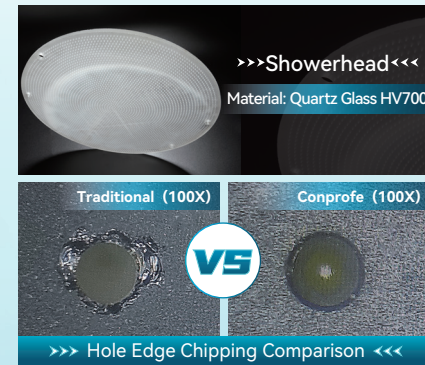
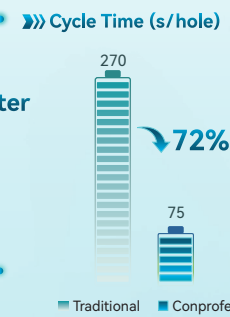
- Low machining efficiency
- Vulnerable to hole edge chipping

Conprofe Solution

- **Ultrasonic Precision Engraving and Milling Center ULM-600**
- + **Ultrasonic** Machining System
- + **Solid PCD** Drill

Conprofe Benefits

- Continuous drilling of **1,200** D0.5x5mm holes
- Cycle time reduced by **72%**, from 270s to 75s per hole
- Hole edge chipping decreased by **68%**, from 0.4mm to 0.13mm



Single Crystal Silicon Curved Electrode Hole Drilling

Challenges

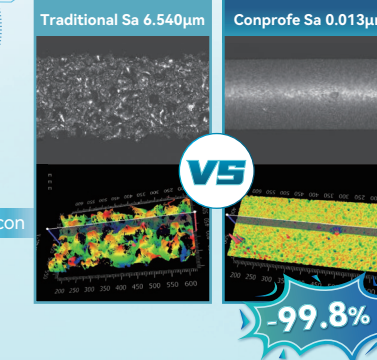
- Immature machining solution
- Hard to control hole perpendicularity
- Hole wall roughness $\geq Sa\ 6.54\mu m$
- Hole roundness $\geq 0.025mm$

Conprofe Solution

- **Ultrasonic Precision Engraving and Milling Center ULM-600**
- + **Ultrasonic** Machining System
- + **Solid PCD Micro** Drill

Conprofe Benefits

- Continuous machining of over **2,000** D0.45x24.75mm ultra-deep holes
- With ultra-deep micro-hole drilling, no obvious chipping around hole edges
- Hole roundness **0.003mm**
- Hole wall roughness down by **99.8%**, from Ra 6.540 μm to Ra **0.013 μm**



Polysilicon Slotted Confinement Ring

Challenges

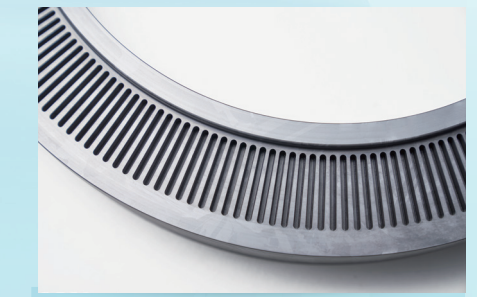
- Low efficiency
- Recurring cracking issues leading to high scrap rate

Conprofe Solution

- **Ultrasonic Precision Engraving and Milling Center ULM-600**
- + **Ultrasonic** Machining System
- + Smartguy Vertical DDR High-Speed Rotary Table

Conprofe Benefits

- Reduced cutting force and improved efficiency with ultrasonic machining
- Lower surface roughness
- Reduced chipping or crack
- Improved hole roundness



Carbon Silicon Showerhead Drilling

Challenges

- High hardness
- Demanding depth-diameter ratio

Conprofe Solution

- **Ultrasonic Precision Engraving and Milling Center ULM-500**
- + **Ultrasonic** Machining System
- + **Solid PCD** Drill

Conprofe Benefits

- Continuously machining over 100 D0.5x6.5mm holes (Depth-Diameter Ratio 13:1)
- Smooth hole wall and good hole quality (Hole chipping size < 0.02mm)



Material: Silicon Carbide



AlSiC Threaded Hole Machining

Challenges

- Cycle time >180s/hole
- Unstable workpiece quality
- Vulnerable to hole edge chipping
- Low precision
- High cost (Tool life <1 hole)

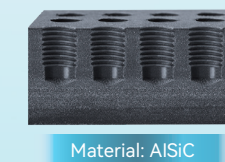
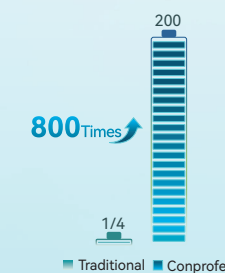
Conprofe Solution

- **Ultrasonic Precision Engraving and Milling Center ULM-400**
- + **Ultrasonic** Machining System
- + **Solid PCD** Drill + **Solid PCD** Thread Mill

Conprofe Benefits

- Tool life improved by **800 times**, from 1/4 hole to 200 holes
- Wall thickness of 0.5mm, without any cracks or chippings

Tool Life (Hole)



Alumina Ceramic Disc Grinding

Challenges

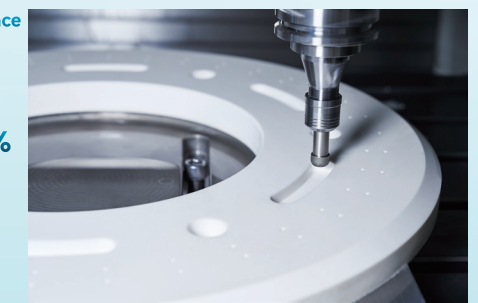
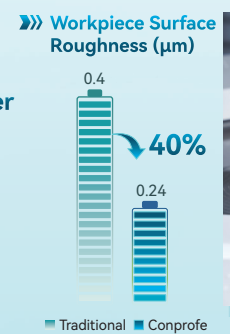
- Low efficiency
- Poor tool life
- Micro grinding cracks giving rise to scrap of the workpiece

Conprofe Solution

- **Ultrasonic Precision Engraving and Milling Center ULM-600**
- + **Ultrasonic** Machining System

Conprofe Benefits

- Better chip evacuation
- Improved machining efficiency
- Reduced micro cracks on the surface of hard-brittle material
- **40%** workpiece surface roughness reduction



Material: Alumina Ceramic

