

L60 PCD DIAMOND LASER PROFILING MACHINE

PDC Beveling, Rounding, Lapping and Profiling

Laps from 16.8 mm down to 16.03 mm; top surface down by 0.55 mm; bevel to 0.5 mm in 4.5 minutes



FEATURES

- Reliable fiber laser source
- Fully automatic lapping
- Online measurement and inspection
- Lapping precision, 0.01 mm
- Surface finish, $<0.2 \mu\text{m Ra}$
- Surface flatness within 0.01 mm of design, perfectly
- matched with next grinding and polishing steps
- Concentric within 0.01 mm
- Continuous unattended running
- Coherent patent-pending technology

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Application Area – PDC Part Laser Lapping

The L60 PCD Diamond Laser Profiling Machine developed by Coherent is a perfect replacement for EDM and diamond powder grinding tools in the lapping, beveling, and rounding of PDC oil and gas parts. The easy-to-run laser tool has the following advantages:

- High efficiency. One L60 laser tool can outperform multiple EDM machines.
- Perfect accuracy. The removal amount can be easily controlled to 0.01 mm.
- Flexibility. Parts with different removal amounts can be loaded and processed in the same run.
- Controllable surface shape. No need to prelap to a flat surface; convex or concave surfaces can be generated as required.
- Low operating cost. Virtually no maintenance or spare parts are required. Key parts can last over 10 years.
- Environmentally friendly. Dust is collected in a dry process; noise is below 75 dB.

Main Characteristics – High Quality, High Efficiency, Low Cost

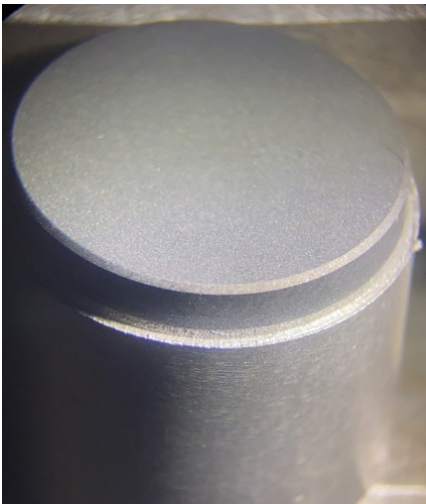
Coherent offers the best-in-class laser tool for diamond material profile lapping to achieve ideal results:

- eMicro processing software - a powerful tool with over 10 years of use in the field.
- Closed-loop control of 4-axis coordinated motion.
- Up to 100 standard pocket positions for 1613 parts; each parts can be assigned with a specific program or lapping thickness.
- Fully automatic: Autoloading, auto measuring, auto lapping, auto inspection, auto unloading, auto logging
- High efficiency. The L60 can lap from 16.8 mm down to 16.03 mm, top surface down by 0.55 mm, bevel to 0.5 mm in 4.5 minutes.
- User-friendly. Easy operation, good noise control, and best-in-class exhaust system design.

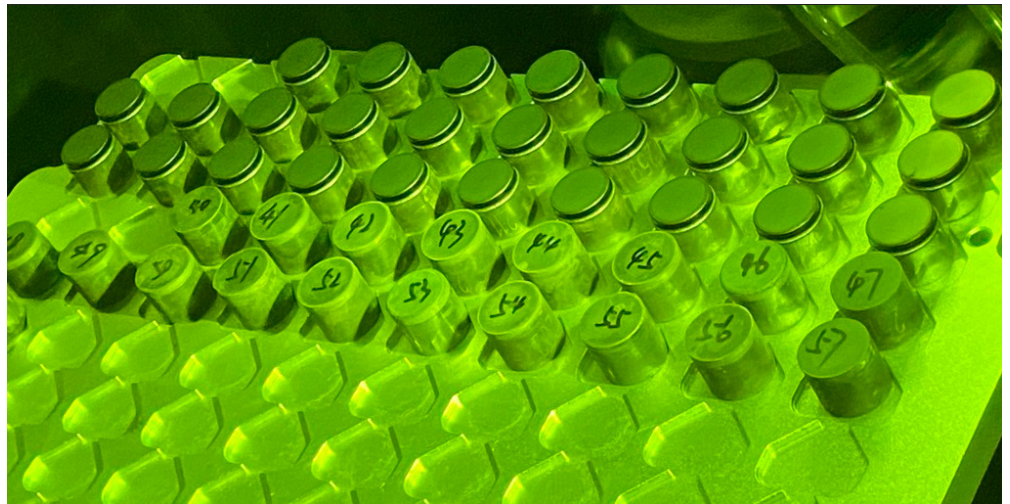
Machine Configuration – Standard, Professional, Intelligent

The L60 Laser Profiling Machine comes in three basic configurations for the user to achieve best performance and cost:

- Standard version: Equipped with touch probe, for pre- and post-lapping measurement and data logging.
- Professional version: In addition to touch probe, a laser proximity sensor is mounted for profile scanning.
- Intelligent version. Multiple sensors are mounted and monitored for data logging and process feedback. Fast processing is possible for specific shapes.



Laser Lapped PDC Surface



Batch PDC Lapping in Progress by L60

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Specifications

Model	L60
Laser Source	Fiber, 1070 nm
Laser Power	450 W
Stroke of Motorized X-Y Stage	300 x 300 mm, 1 μ m resolution
Max Traverse Speed	3000 mm/min
Z axis	150 mm, 1 μ m resolution
C axis	0.1 degree resolution
Supply	5 KW, 220 V; 2 x D8 compressed air 0.6 Mpa
Environment	No dust, no vibration. Operating temperature: 15°C-30°C
Dust and Fume Removal	Min 10 m ³ /min
Machine Size (W/D/H in mm)	940/1680/1770
Exhaustion size (W/D/H in mm) /weight	730/650/1660 (100 Kg)
Total Weight	850 Kg
Processing Capability (for reference only)	
Lapping Rate	D16.8 to D16.03 mm, 0.55 mm top removal, 0.5 mm bevel @5-6 min; 2 μ m Ra