



Flawless Technical Diamonds

SINGLE CRYSTAL DIAMOND SUBSTRATES WITH UNMATCHED CHARACTERISTICS
THE BEST TECHNICAL DIAMONDS ON THE MARKET

Key Information

Our Company

FTDiam is a US-based company specializing in the production of diamond substrates, made with unique advanced HPHT technology (AHPHT).

Our Technology

Type IIa single-crystal diamond material with outstanding parameters:

- Record-breaking plate sizes, up to 15x15 mm.
- Exceptional crystalline lattice quality with dislocation densities as low as 10^1 cm^{-2} .
- Extremely low Boron and Nitrogen concentration.

Innovative Material Development

Continuous investments in R&D to meet evolving technical demands:

- Nitrogen-doped materials.
- Boron-doped materials.
- Custom surface orientations and miscut specifications.
- Any shapes and sizes based on customer requirements.
- Fine polishing services with sub-nm surface roughness.



Advanced HPHT Technology

Key Points



AHPHT production facility managed by FTD team.



Unique approach to AHPHT technology enables flawless type IIa single-crystal diamonds.

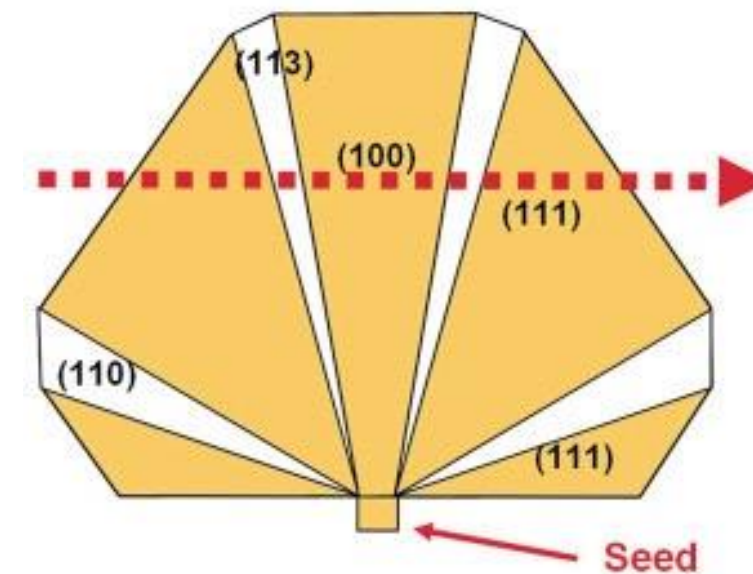


Precise nitrogen and boron content control.

Capable of producing large diamond crystals of more than 100 carats.



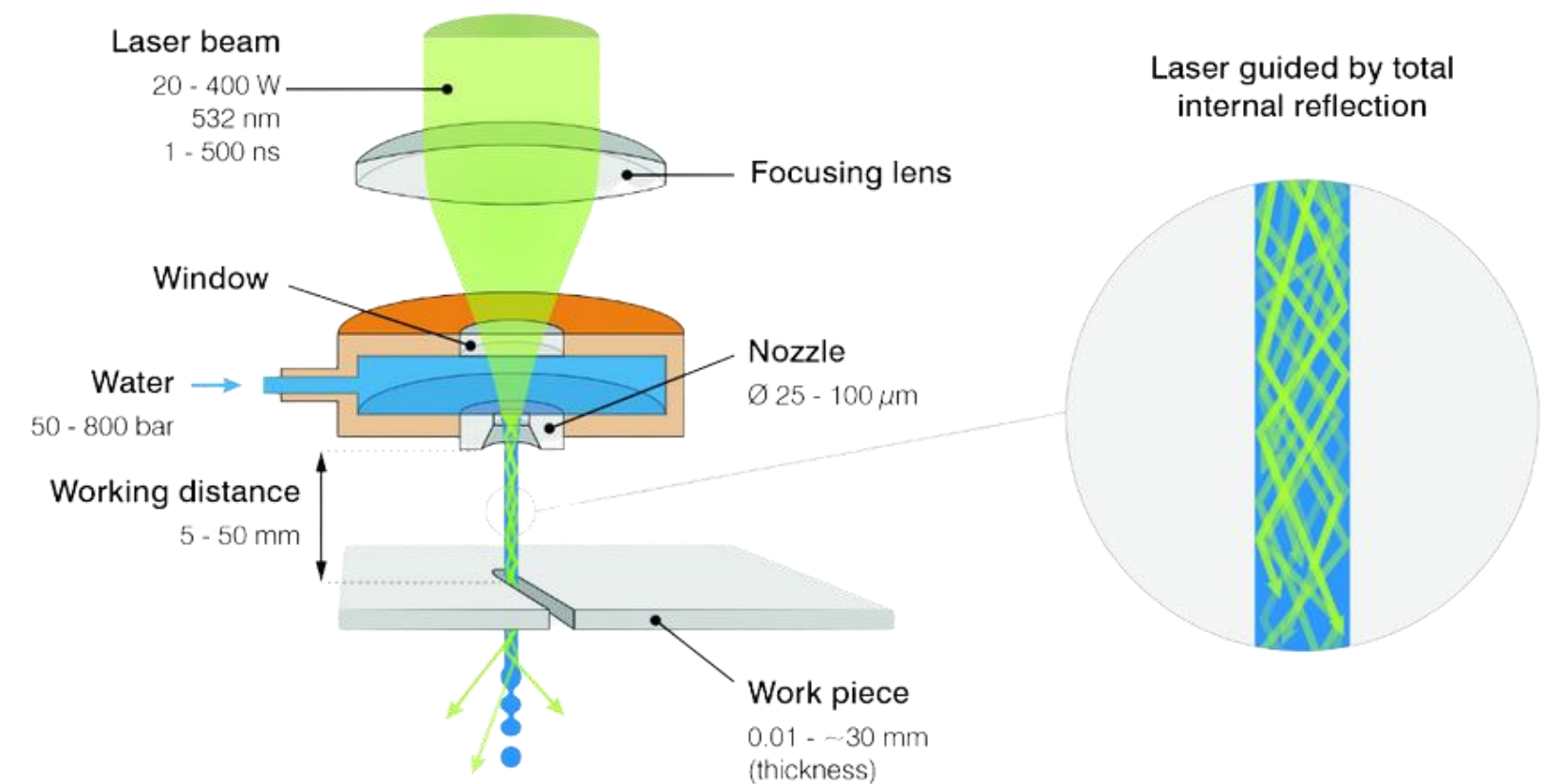
Maintaining precise control over synthesis process parameters and materials used ensures the production of exceptionally pure crystals with dislocation levels as low as 10^1 cm^{-2} .



Diamond Plate Processing

High-precision diamond substrates tailored to custom specifications

- Large diamond substrates up to 15x15 mm are cut from rough material.
- Plates feature defect-free working surfaces, free of cracks and chips.
- The manufacturing process supports the production of mono-sectorial or multi-sectorial substrates in various shapes, sizes, and complexities, with precisely controlled specifications.
- Substrates can be cut with different surface orientations, including (100), (111), (110), among others.
- Custom miscuts are available to meet specific customer requirements.



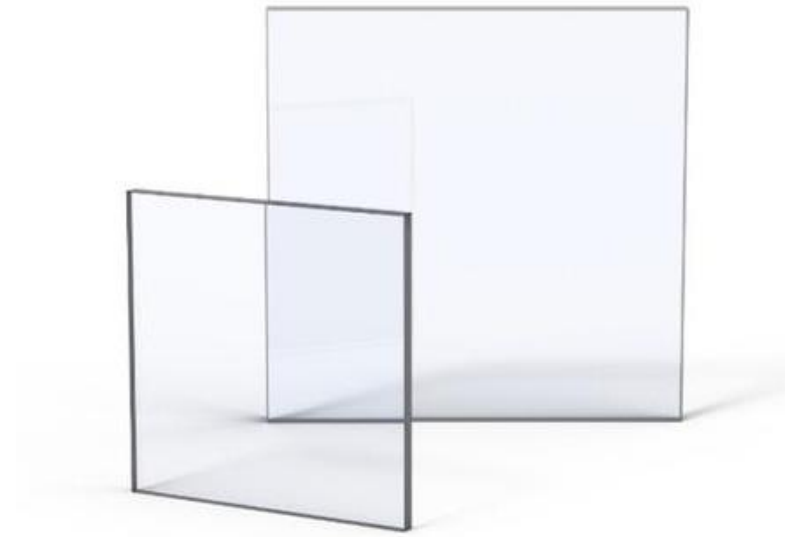
Synova Laser MicroJet®:
Water-jet green laser
guarantees parallelism

Products

FTDiam supplies single-crystal diamond substrates, anvils, lenses and any other custom-shaped products

Range of our products applications:

- X-ray and laser optics.
- Electronic and power devices.
- Field and particles detectors.
- Quantum technologies.
- CVD growth.



Diamond Substrates

Unique specification of synthetic diamond substrates

Material: Type IIa single-crystal diamond plates produced using AHPHT technology.

Quality: No Inclusions, defects, cracks or chips at 50x magnification.

Purity:

- Boron concentration ≤ 20 ppb.
- Nitrogen concentration ≤ 5 ppb.
- Boron or nitrogen doping available up to 50 ppm.

Crystallography: Mono-sectorial or multi-sectorial single crystal diamond plates.

Dislocations density: As low as 10^1 cm^{-2} .

Surface orientation: Standard options include (100), (111), and (110) surface orientation, with any additional custom orientations available.

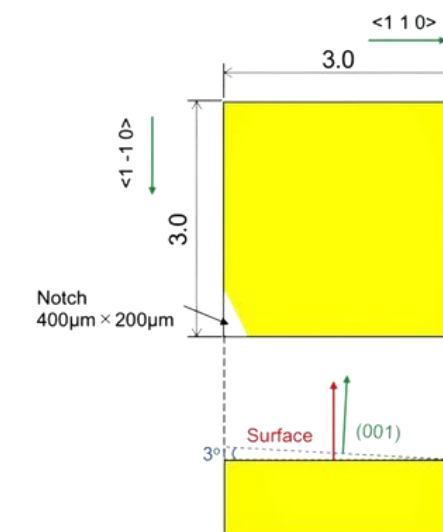
Miscut: Standard 3° miscut from surface orientation; custom options available with $\pm 0.5^\circ$ tolerance.

Standard Sizes: Available sizes range from 3x3 mm to 15x15 mm.

Thickness: Standard thicknesses include 0.3 mm, 0.5 mm, and 1 mm, with custom options available from 0.1 mm to 10 mm.

Surface Polishing: Surface roughness (Ra) as low as 0.5 nm, with options for chemical-mechanical polishing (CMP) and other techniques without subsurface damage.

Customization: Shapes, sizes, doping, orientation, miscut, polishing and other specifications based on customer requirements.



Diamond Anvils

Unique specification of synthetic diamond anvils

Material: Type IIa single-crystal diamond plates produced using AHPHT technology.

Quality: No Inclusions, defects, cracks or chips at 50x magnification.

Purity:

- Boron concentration ≤ 20 ppb.
- Nitrogen concentration ≤ 5 ppb.

Crystallography: Mono-sectorial or multi-sectorial single crystal diamond anvil.

Dislocations density: As low as 10^1 cm^{-2} .

Table orientation: Standard (100) table orientation, with any additional custom table orientations available.

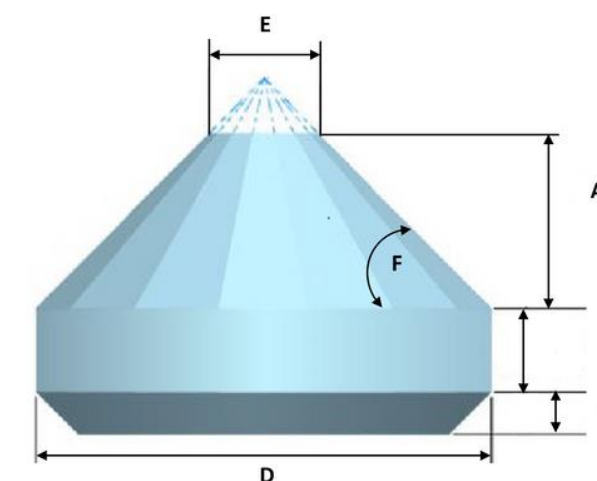
Miscut: Standard 3° miscut from table orientation; custom options available with $\pm 0.5^\circ$ tolerance.

Standard Diameter: Available diameter range from 3 mm to 12 mm.

Design: Available in both smooth and faceted designs.

Surface Polishing: Surface roughness (Ra) as low as 0.5 nm, with options for chemical-mechanical polishing (CMP) and other techniques without subsurface damage.

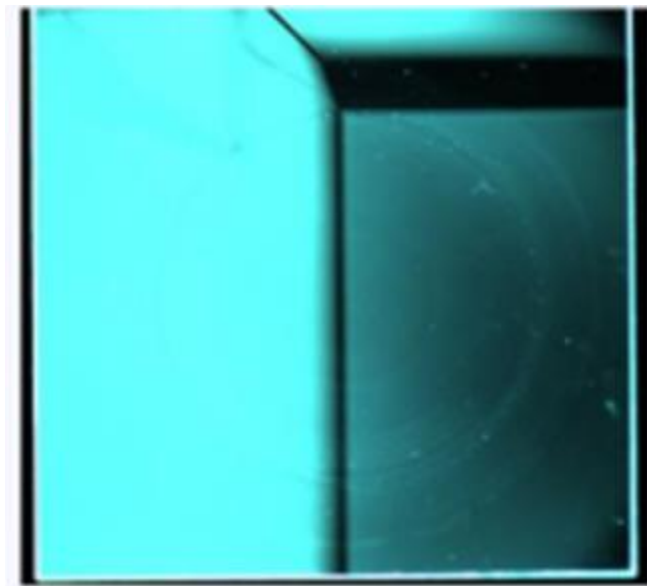
Customization: Shapes, diameter, design, table orientation, miscut, polishing and other specifications based on customer requirements.



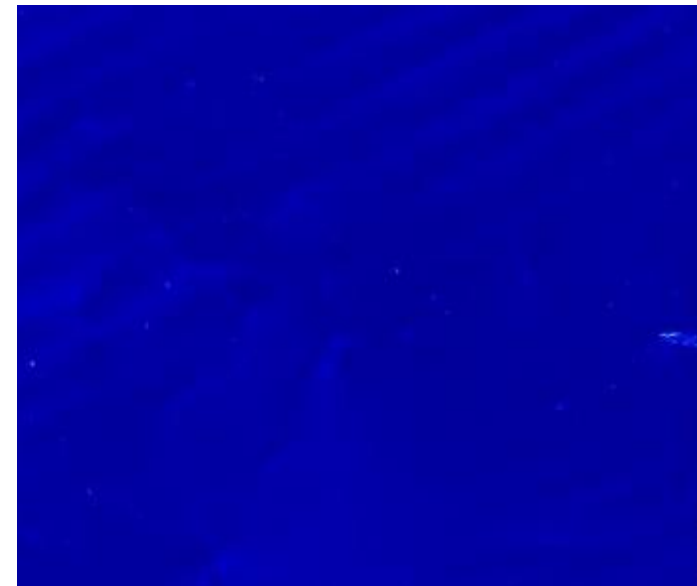
Substrates Quality Analysis

DIAMOND VIEW AND POLARIZED LIGHT MICROSCOPY

Orientation: (100)
Crystallography: multi-sectorial
Size: 5.00 x 5.00 x 0.50 mm

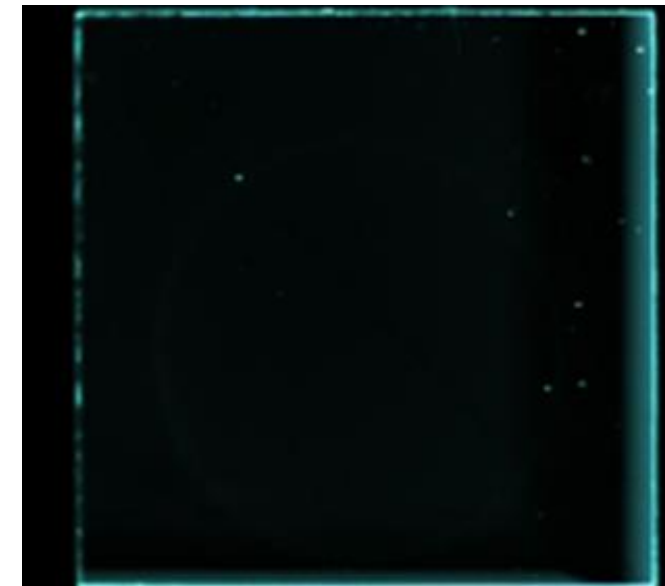


Diamond View Image shows minor inclusions, no defects and a very low level of dislocations and confirms that there are several sectors

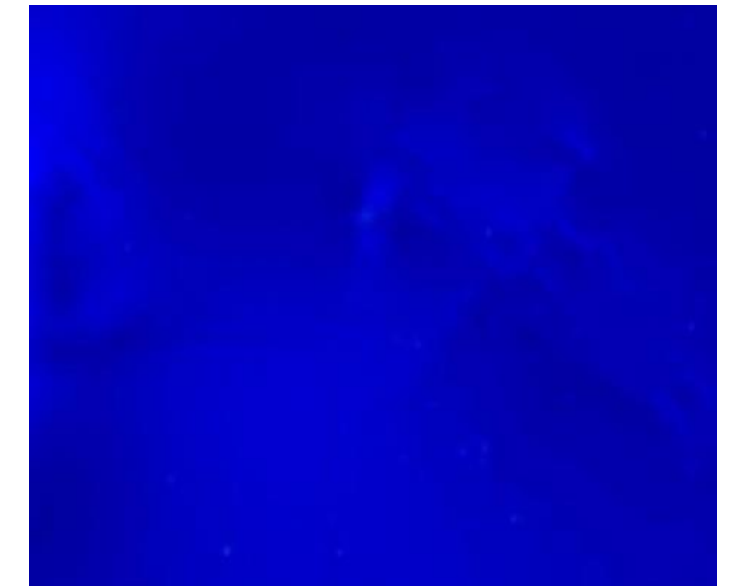


Polarized light microscopy image shows very low strain in birefringence

Orientation: (100)
Crystallography: mono-sectorial
Size: 5.00 x 5.00 x 0.50 mm



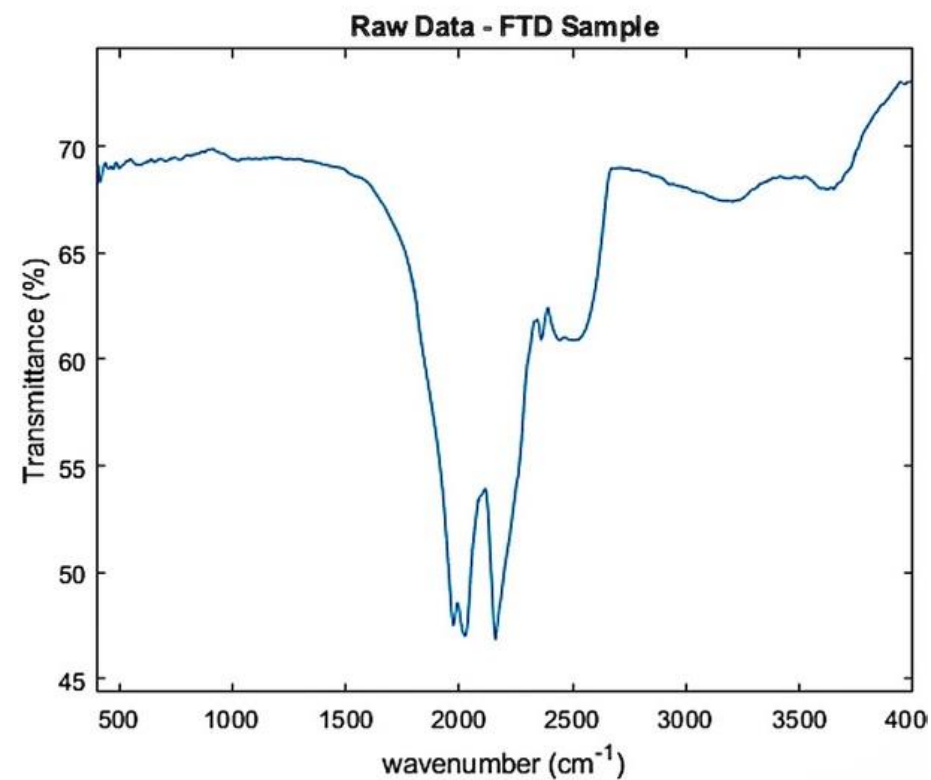
Diamond View Image shows minor inclusions, no defects and a very low level of dislocations and confirms that there is only one sector



Microscope Image shows very low strain in birefringence

Substrates Quality Analysis

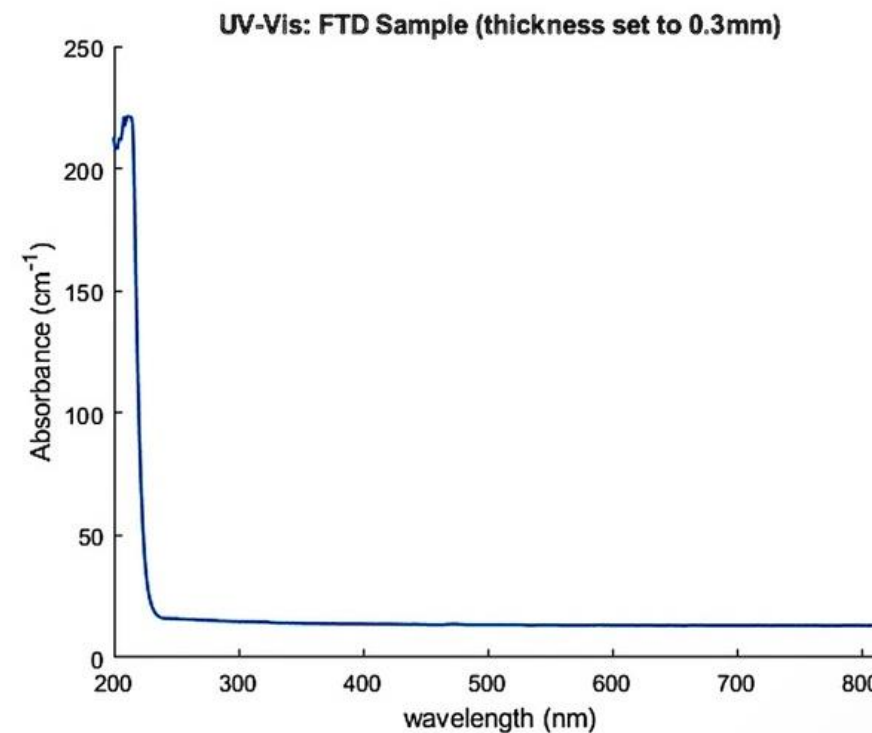
FOURIER TRANSFORM INFRARED SPECTROSCOPY (FTIR)



Equipment: Shimadzu IR Tracer-100
Spectrometer

Results are consistent with trace
levels of boron incorporation

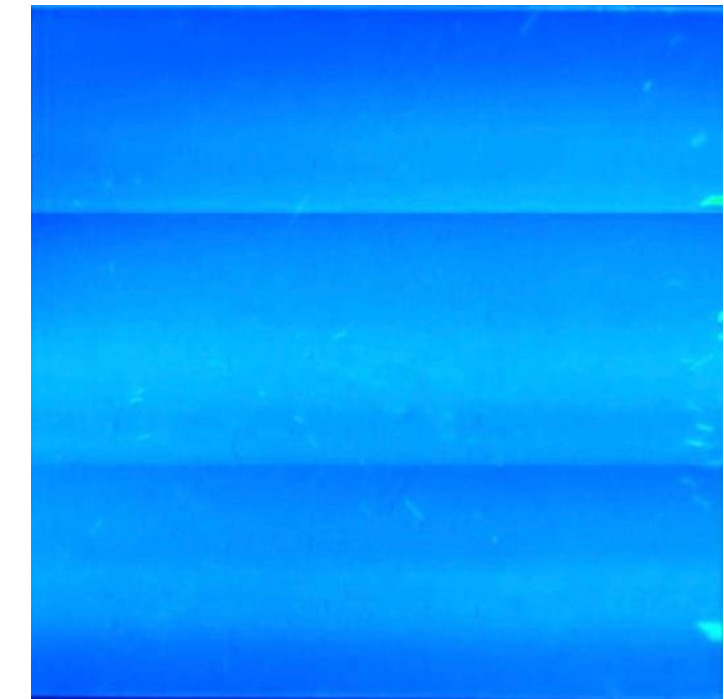
ULTRA-VIOLET VISIBLE SPECTROSCOPY (UV-VIS)



Equipment: Shimadzu UV-3600 UV-VIS-
NIR Spectrometer

Results are consistent with a very
high quality diamond sample

X-RAY DIFFRACTION IMAGING (TOPOGRAPHY)



Surface orientation (100), edge
orientation (110)
Size: 10.00 × 10.00 × 0.50 mm

Dislocation density: <50 cm⁻²



PARTNER WITH US FOR FLAWLESS QUALITY AND
TECHNOLOGICAL EXCELLENCE IN LAB-GROWN DIAMONDS.



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