



# STEVEN SEPVEST CORPORATION

## CVD Diamond for Electronics Data Sheet

We mass produce polycrystalline CVD diamond wafers by Microwave and DC arc plasma jet approaches. Our undoped diamond wafers are colorless, very high purity, very high thermal conductivity, and cost effective. We manufacture thousands of diamond wafers every year, with many of them highly polished on both sides up to roughness < 2 nm. We provide laser cut and laser scribe per customers' requirements. They were used as substrates for electronics devices, mounts for high-power integrated circuits, laser diodes, GaN on Diamond and heat spreader for satellite, etc.

We provide high purity single crystal CVD diamond, and optical grade polycrystalline CVD diamond. Contact us for details.

### Unique properties of CVD Diamond:

- Unsurpassed hardness
- Extremely high thermal conductivity (>1800 W/mK, five times that of copper)
- Broad band optical transparency
- Chemically inert: Not affected by any acid or other chemicals
- Graphitization only at very high temperatures (700°C in oxygen, 1500°C in inert atmosphere)

### Specifications

- Tolerance of Thickness:  $\pm 25\mu\text{m}$
- Flatness:  $< 4\mu\text{m}/\text{cm}$
- Thermal conductivity: Up to 2000 W/mK (1000 - 1800 W/mK selectable)
- Dielectric Constant: 5.7
- Electrical Resistivity:  $> 10^{14} \text{ ohm-cm}$
- Thermal expansion coefficient  $1.0 \times 10^{-6}/\text{K}$  @300K
- Debye temperature  $1860 \pm 10\text{K}$
- Bandgap 5.45 eV
- Density:  $3.5\text{g}/\text{cm}^3$
- Young's modulus: 1000-1100Gpa
- Growth side surface finish:  $< 2 \text{ nm Ra}$ . Custom polish available
- Seed side surface finish:  $< 2 \text{ nm Ra}$ . Custom polish available
- Color: Clear

### Standard Sizes

Double sides polished: 66 mm, and 100 mm in diameter

Raw thickness: Between 0.3 mm and 1.5 mm

Polished thickness: Between 0.2 mm and 1.0 mm

### Customize

Polishing up to  $< 2\text{nm}$  Roughness on both sides.

Laser cutting and drilling

Laser Scribe

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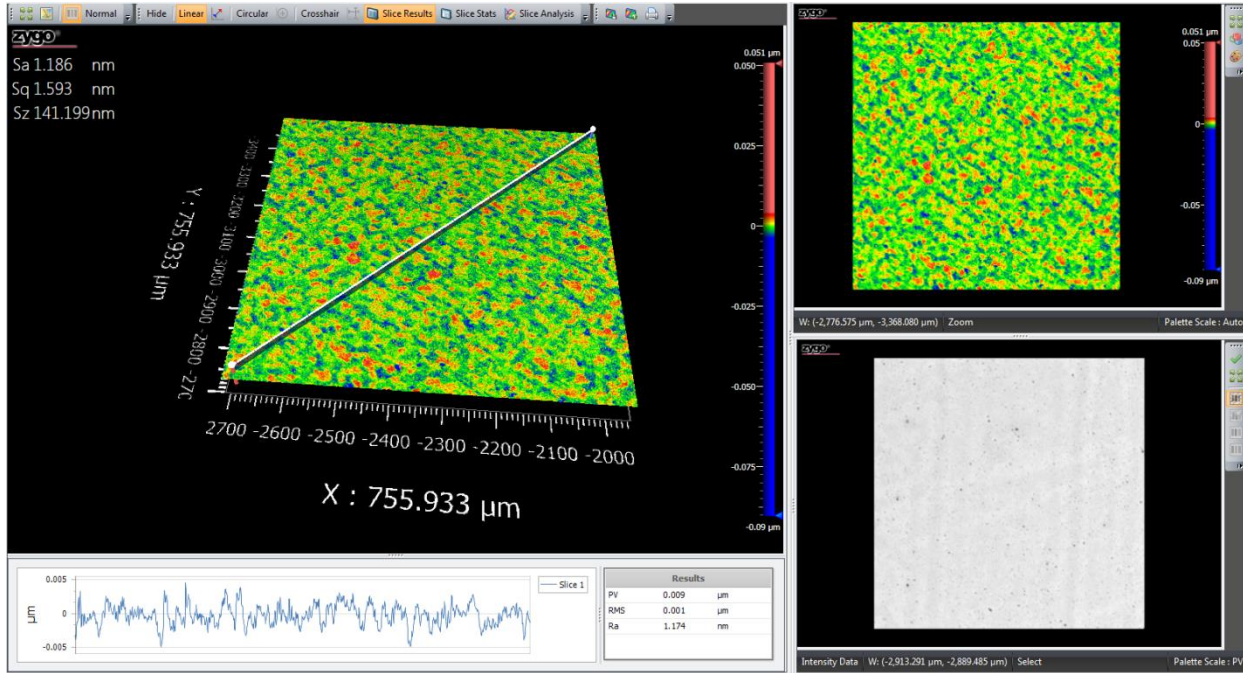
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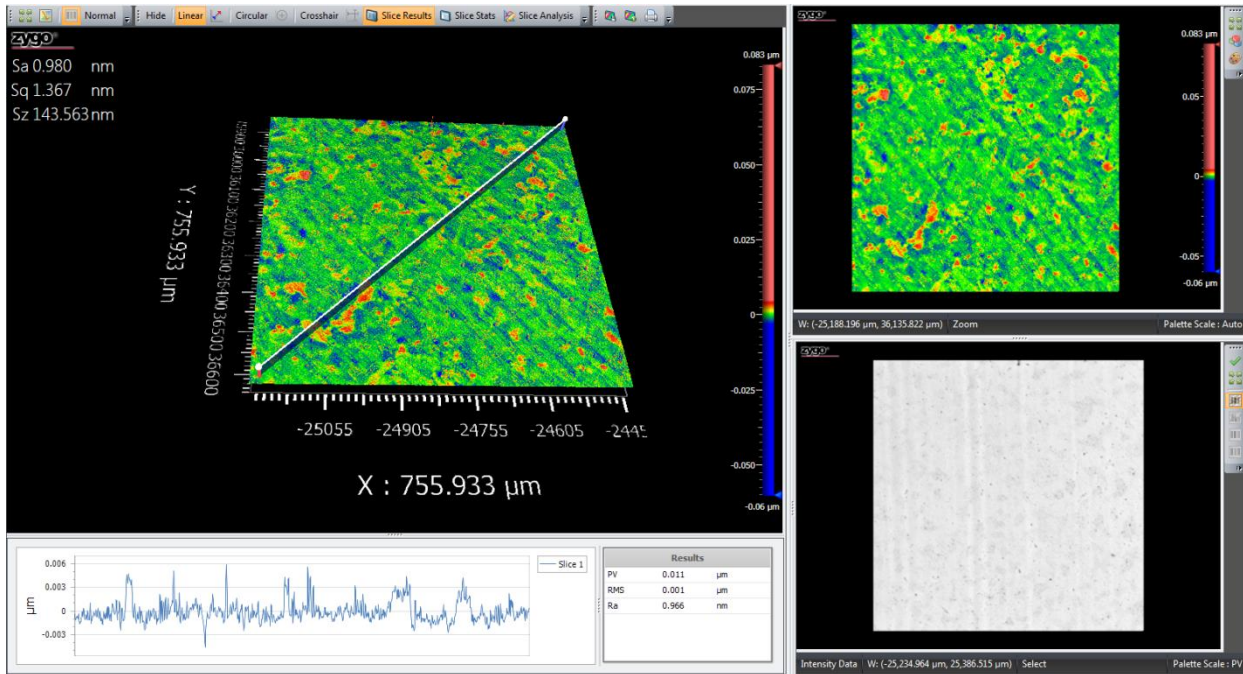
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## Surface Roughness

The following pictures were the surface data of our highly polished CVD Diamond Wafer, measured by Zygo NewView 9000 3D Optical Surface Profiler.



Seed Face Roughness Ra= 1.17 nm.



Growth Face Roughness Ra= 0.97 nm.