

NANODIAMOND SLURRY



FOR CHEMICAL MECHANICAL POLISHING (CMP)
OF SYNTHETIC SAPPHIRE WAFERS

TECHNICAL DATA SHEET

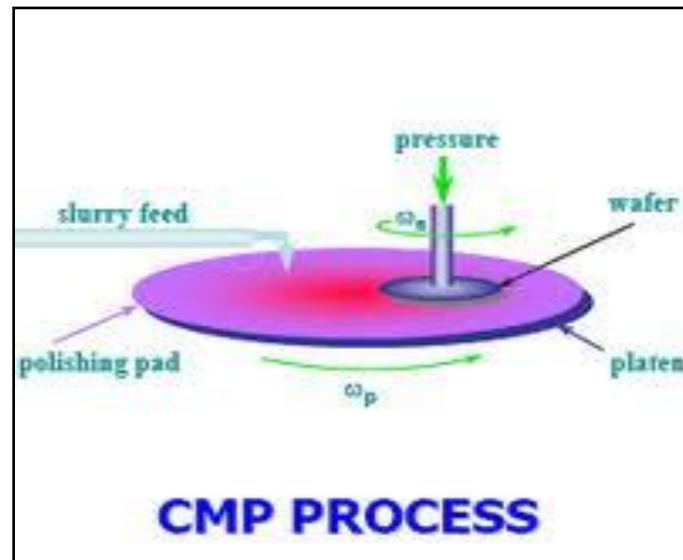
GENERAL INFORMATION



- **Product name:** RT-PS-AI203
- **Code:** 514305671-511
- **Manufacturer:** Ray Techniques Ltd.
made in Israel www.nanodiamond.co.il
- **Product use:** concentrated nanodiamond water-based suspension (slurry) for Chemical Mechanical Polishing (CMP) of synthetic sapphire substrates in semiconductor and optoelectronic industries
- **Product properties:**
grayish brown, odorless,
density (25 °C): 1.0 g/cm³, pH=7,
average nanodiamond size: 4-5 nm

USAGE

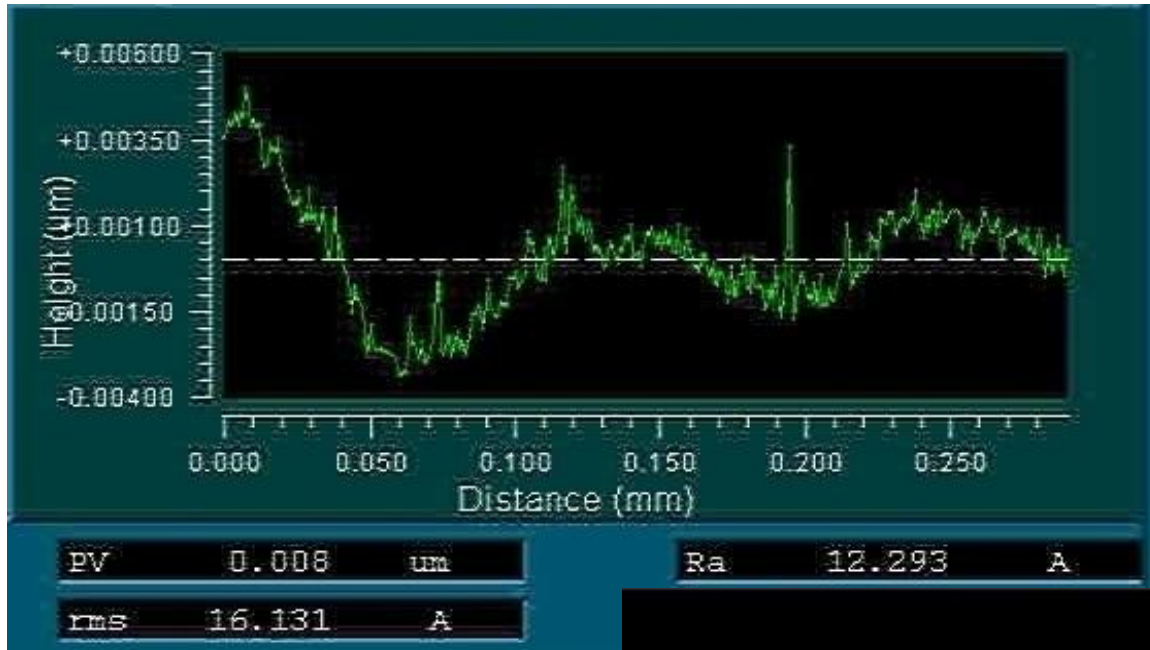
- ◉ 500 ml should be mixed with 9.5 liter of deionized water and used in CMP process for the planarization of sapphire wafers
- ◉ Recommended polishing pad: Cu resin
- ◉ Head rotary speed: 50 - 150 rpm
- ◉ Pressure: 400 - 1500 g/cm²
- ◉ Fine filtering is required
- ◉ The polished surface should be washed with water after the polishing



RT-PS-AL302 FEATURES

- ⦿ Special composition of the slurry provides the forming **nanometric layer** between the polishing surface and the polishing pad
- ⦿ The composition contains **active components** rapidly destroying covalent bonds in crystal structure of sapphire surface
- ⦿ Specially prepared nanodiamonds actively scrape the decomposition material and **adsorb** it on their surface removing it from the polishing area
- ⦿ In addition, nanodiamonds with extraordinary hardness and the average size of **4-5 nm** provide super-smooth synthetic sapphire surfaces with the **roughness of less than 1-2 nm**

TESTING RESULTS

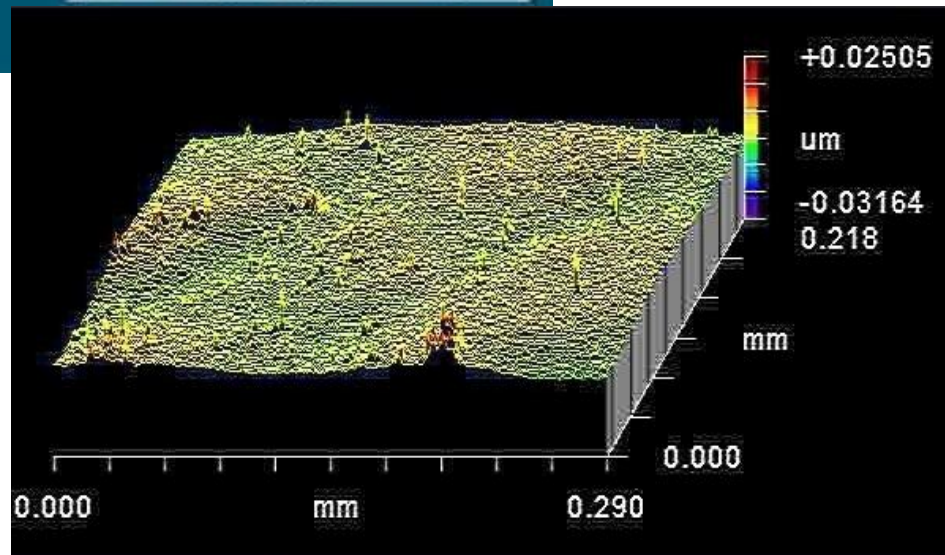


Laser monocrystalline sapphire window polished with RT slurry at Gavish Ltd (Omer, Israel)

Results:

Ra= 1.2 nm

Rms=1.6 nm



ADVANTAGES

- ◉ Very low roughness (< 2 nm)
- ◉ Decrease in scratches and dislocations
- ◉ Reducing mechanical stress in surface layer which is highly important for epitaxial layers
- ◉ High productivity of the polishing process
- ◉ Non-toxic, environment friendly