NANODIAMOND SLURRY

FOR CHEMICAL MECHANICAL POLISHING (CMP)
OF SYNTHETIC SAPPHIRE WAFERS

TECHNICAL DATA SHEET
Product name: RT-PS-Al2O3

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
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**
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