AIR PRODUCTS

BPS-729

Surfactant-Formulated Dicing Solution & Oxide Remover

BPS-729 is a multi-function surfactant-formulated solution that is used as an additive to DIW during the dicing process for high-performance cleaning through superior wetting.

In addition to preventing adherence of silicon particles and swarf (saw residue) on Al and Cu substrates, BPS 729 also removes oxidation from bond pads and retards subsequent regrowth. Because of a very low etch rate on various base materials, these substrates are not affected.

BPS 729 is recommended for use between 500:1 and 1000:1 for cleaning applications, ~ 50:1 for Copper Oxide removal and ~ 2:1 for Aluminum Oxide removal applications

BPS-729 treatment is typically followed by a DI water rinse and dry as is typically performed within the dicing machine or on a standalone tool.

BENEFITS

- Room temperature application
- Does not attack the base metal
- Works on Cu, Al, Sn, and Pb, among others
- Eliminates the need for scrubbing the wafer post-saw
- Eliminates the need for CO_2 sparged DIW
- Removes oxides that lead to poor wire bonding
  - Reduces failure rate (no sticks) at wire-bonding due to minimally oxidized bond pads
  - Overall reduced cost of ownership by eliminating the need for costly cleans/rework process such as Argon-plasma etch
- Minimal oxide growth through at least 14 days

TYPICAL PHYSICAL PROPERTIES (Undiluted)

Form: Liquid
Color: Clear
Density: 1.03 g/cm3
pH: 1.5-2.5

MATERIAL COMPATIBILITY

Wetted Parts

- High-density polyethylene (HDPE)
- PFA
- PTFE
- PVDF
- Polypropylene
- EPDM
- 304 Stainless Steel, 316 Stainless Steel
-

O-Rings

- FEP Encapsulated Viton, Kalrez, EPR

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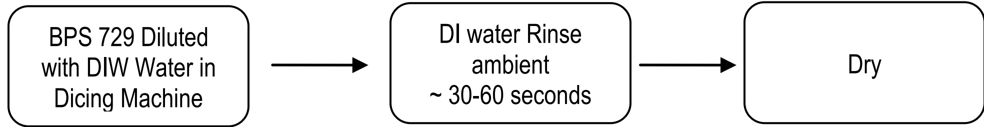
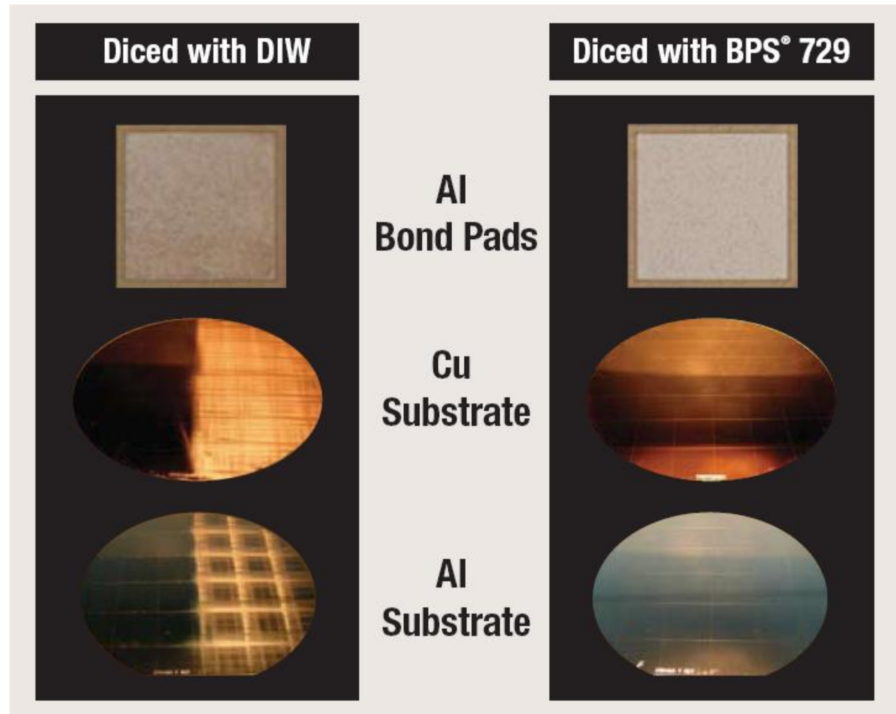
RECOMMENDED INSTRUCTIONS FOR USE

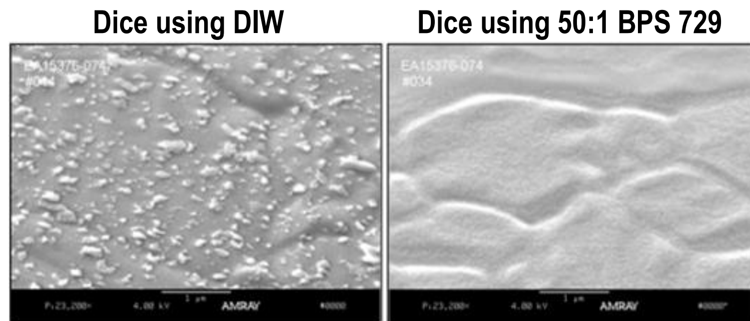
The dicing process with BPS 729 is recommended to be followed up with a short (30 – 60s) DIW rinse and dry



PERFORMANCE DATA – SWARF/RESIDUE REMOVAL



On the LEFT - Dicing using DIW-only leaves thick residue/swarf - wafer needs to be scrubbed (left hand side of wafer) to remove swarf; On the RIGHT - Dicing using BPS 729 @ 1000:1 cleans wafer completely ***without*** *the need for scrubbing wafer. Processed on LoadPoint NanoAce tool; 6" Si wafer with 25mmx25mm cut; 4 minute dicing process*



BPS 729 is able to remove oxides and other particles as compared to DIW, as can be seen from the clearly visible grain boundaries of these Al bond pads in this SEM image

BPS-729

PERFORMANCE DATA – OXIDE REMOVAL

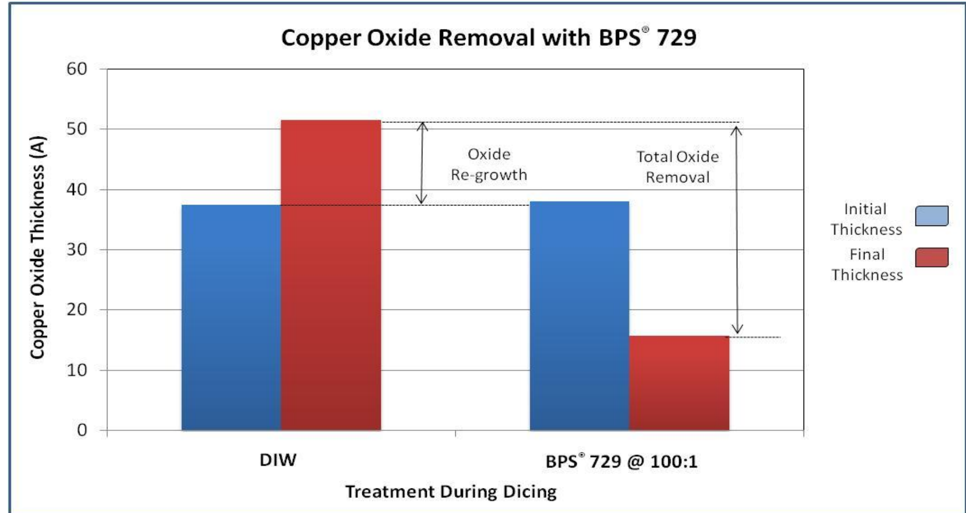


Chart shows Copper Oxide film thickness before dicing and 28 hours after dicing. Delay time after treatment impacts re-growth of Copper Oxide. BPS 729 @ 100:1 has a net <u>*decrease*</u> *in Copper Oxide thickness even despite re-growth, while DIW shows a net* <u>*increase*</u> *in copper oxide thickness. Measurements made using ellipsometry*

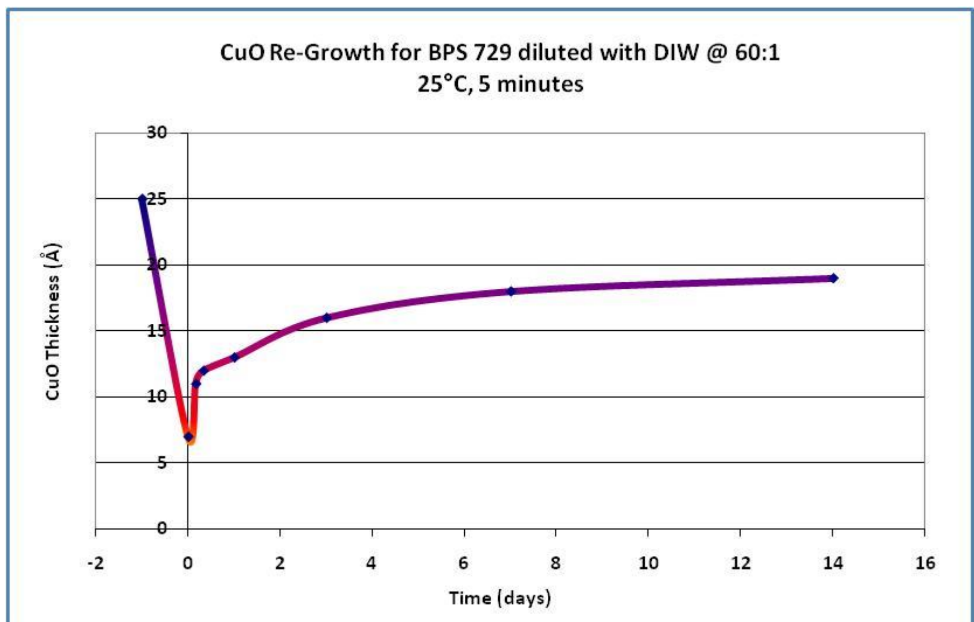


Chart shows treatment of BPS 729 @ 60:1 dilution resulting in 7 A of Copper Oxide thickness at time = 0 from intial thickness of 25A. The oxide then regrows by less than 11 A over 2 weeks.

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BPS-729

STORAGE, HANDLING and PROTECTIVE CLOTHING

Contact the Air Products Technical Center at 1-800-752-1597 or gastech@airproducts.com for a MSDS.

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