



INTERVIA™ PHOTODIELECTRIC 8023 SERIES

For Advanced Packaging Applications

Regional Product Availability			
N.America	Japan/Korea	Asia	Europe
✓	✓	✓	✓

DESCRIPTION

The InterVia 8023 Series photodielectrics are spin-on deposited, negative tone, TMAH(aq) developable and curable at low temperatures. Typical applications include redistribution of bond pads for wafer-level CSPs and device top-coat protection. InterVia Photodielectric 8023 Series photodielectrics (IVD) can often substitute for other dielectric materials such as; polyimide (PI), benzocyclobutene (BCB) and polybenzoxazole (PBO). Wide processing windows, low-shrinkage during cure and minimal moisture uptake eases processing and can lead to improved yields.

ADVANTAGES

- TMAH puddle development
- Excellent resolution
- Wide processing windows
- Excellent chemical resistance, electrical, thermal, and mechanical properties
- High Glass Transition Temperature (T_g)
- Low-shrinkage during cure
- Low moisture absorption
- Low cost-of-ownership vs. BCB and PI

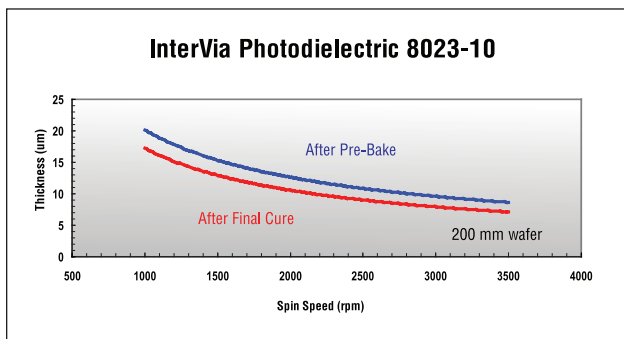


Figure 1: 200mm Wafer Spin-Speed Curve showing shrinkage after cure

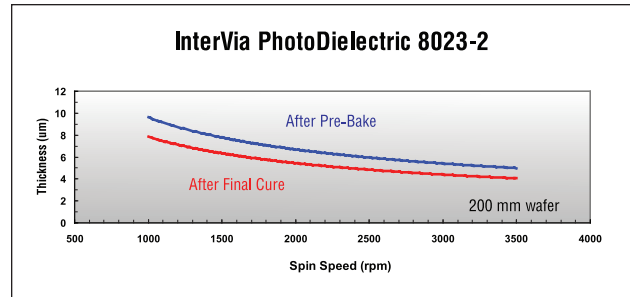


Figure 2: 200mm Wafer Spin-Speed Curve showing shrinkage after cure

ELECTRICAL PROPERTIES

- Dielectric Constant: 3.2 @ 1GHz
- Dielectric Loss: 0.033 @ 1GHz
- Surface Resistivity: >10¹⁴ Ohm (DC Bias: 100V)
- Volume Resistivity: >10¹⁶ Ohm-cm (DC Bias: 100V)

THERMAL/MECHANICAL PROPERTIES

- Glass Transition Temperature (T_g): 181°C
- CTE Unsupported (T<T_g): 62 ppm/°C
- Water Absorption: <0.5%
- Elastic Modulus: 4.0 GPa

INTERVIA PROCESS FLOW

(10 µm thick process)

1. Coat InterVia Photodielectric 8023
2. Soft Bake (hot plate 140°C*/3 minutes)
3. Expose (500 mJ/cm²** UIT 150/UVD-S365)
4. Post Exposure Bake (hot plate 100°C*/3 minutes)
5. Puddle develop with InterVia BP Developer (2.38% TMAH)
6. Post-Developed Bake (hot plate 140°C*/30 seconds)
7. Standard thermal cure is 200°C/60 minutes, alternatively applications may have a thermal cure of 175°C/3 hours.

*Temperature of wafer surface

**On dielectric

INTERVIA PHOTODIELECTRIC 8023

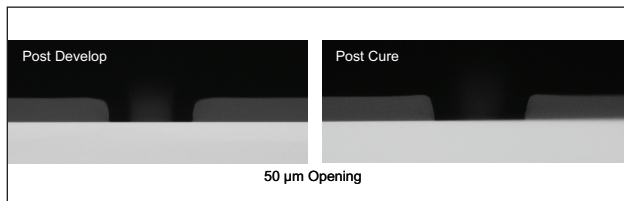


Photo 1: Patterned 8023-10 Before and After Cure

INSTRUCTIONS FOR USE

It is recommended that the dielectric should be processed under clean room conditions of class 1000 or better.

Coating

InterVia Photodielectric 8023 has been formulated for spin coating. For 8–16 µm thickness after cure, InterVia Photodielectric 8023-10 (900 to 1,100 mPa•S @ 20°C) is recommended.

Soft Bake/Solvent Removal

For a thickness of 10 µm (after cure), soft baking is performed by hot plate at 140°C* for 3 minutes.

Exposure

InterVia Photodielectric can be exposed with commercially available mercury vapor and metal halide UV light sources. For a thickness of 10 µm (after cure), an exposure dose of 500 mJ/cm²** is recommended. The absorbance range of InterVia Photodielectric 8023 is 350 to 430 nm.

Post-Exposure Bake

After exposure, the coating must be baked using a hot plate at 100°C* for 3 minutes.

Development

After post-exposure bake, InterVia Photodielectric 8023 films are developed using InterVia BP (2.38% TMAH). The operation should be done at room temperature. InterVia Photodielectric 8023 can be puddle developed in standard equipment. For a 10 µm thickness after cure, two puddle steps will be necessary. Puddle program will vary with coating thickness and equipment.

Post-Developed Bake

After development, the coating must be baked with hot plate at 140°C* for 30 seconds.

Thermal Cure

Thermal cure can be performed in a nitrogen environment using a rampable convection oven, horizontal or vertical furnace at 200°C for 60 minutes (Alternative applications at 175°C for 3 hours).

*Temperature of wafer surface

**On dielectric

TYPICAL PROCESS RESULTS

Typical resolution of IVD 8023 is better than 1:2. (Thickness:opening) The patterned image below shows 10 micron lines in a 13.9µm thick film.

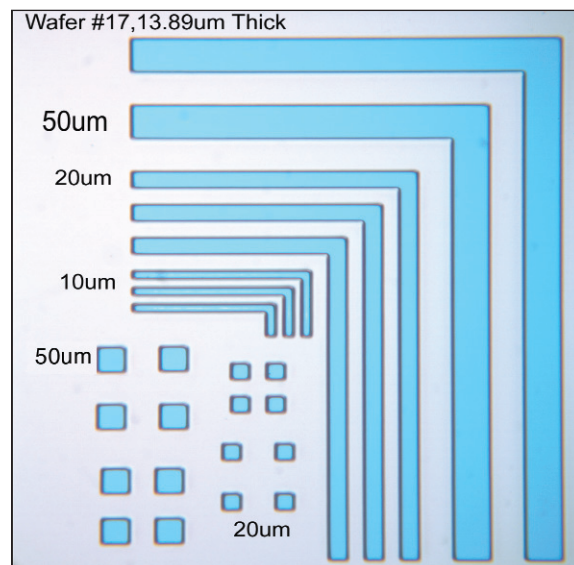


Photo 2: Data based on 6 inch wafer (150 mm), no topography, using standard broadband aligner.

INTERVIA PHOTODIELECTRIC 8023

EQUIPMENT

InterVia Photodielectric 8023 is compatible with most commercially-available photoresist processing equipment. Compatible materials include:

Stainless steel, glass, ceramic, nylon, PTFE fluoropolymer, unfilled polypropylene and high-density polyethylene.

PRODUCT OFFERING

Currently 8023 Series photodielectrics are offered in two standard viscosities;

- 8023-10 (1,000 cP)
- 8023-2 (200 cP)

For special viscosities or dilution instructions please speak with your sales or technical representative.

PRODUCT DATA

For the specific Product Data values, please refer to the Certificate of Analysis provided with the shipment of the product(s).

ASSOCIATED PRODUCTS

InterVia PhotoDielectric 8023-10
InterVia PhotoDielectric 8023-2
InterVia BP Developer
Shipley BPR PhotoStripper
EBR-10A

HANDLING PRECAUTIONS

Before using this product, consult the Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) for details on product hazards, recommended handling precautions and product storage.

CAUTION! Keep combustible and/or flammable products and their vapors away from heat, sparks, flames and other sources of ignition including static discharge. Processing or operating at temperatures near or above product flashpoint may pose a fire hazard. Use appropriate grounding and bonding techniques to manage static discharge hazards.

CAUTION! Failure to maintain proper volume level when using immersion heaters can expose tank and solution to excessive heat resulting in a possible combustion hazard, particularly when plastic tanks are used.

STORAGE

Store products in tightly closed original containers at temperatures recommended on the product label.

DISPOSAL CONSIDERATIONS

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Rohm and Haas Electronic Materials Technical Representative for more information.



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