



## For Semiconductor Wafer Bonding and Through-Silicon Via Applications, Shin-Etsu MicroSi Introduces New Dry Film Dielectric Photoresist

*Vacuum laminated dry films for 3D TSVs flow into vias for void free, planarized coverage.*

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Shin-Etsu MicroSi has introduced an extension of their photosensitive dry film dielectric technology for 3D Through-Silicon Vias and two-dimensional wafer bonding applications. This [SINR™](#) negative photoresist film, introduced last year, is available now in thicknesses from 12 to 100 microns. Other non-3D applications for the photoresist include stress buffer and RDL dielectrics for wafer-level packaging.

These films feature:

- Low residual stress featuring an ultra low modulus, which produces a “rubbery” consistency to the film and results in minimal wafer bow, particularly important with 300mm wafers that are hard to process if the wafers are not flat.
- Low temperature cure: many device types, for example, can fail if processed above 200° C.
- Good adhesion: Shin-Etsu proprietary adhesion promoters are built in to ensure good bonding.
- Low dielectric constant for superior electrical performance.

Shin-Etsu Chemical developed the siloxane-based SINR series photoresist from their long tradition of working with silicone materials. ShinEtsu has tailored the materials to specific, custom applications.

### **Through-Silicon Vias (TSV)**

For TSV applications, these films can be applied with a roll laminator or by vacuum lamination, which is preferred for TSV because the combination of temperature, pressure and vacuum allows the material to flow into the vias, producing a void-free dielectric fill and a planarized surface. CMOS image sensors are the first process that now uses this TSV technology. TSVs can typically feature vias that are 50 to 100 microns across.

### **CMOS Image Sensors:**

Shin-Etsu MicroSi SINR works well for bonding applications including:

- Wafer-to-wafer
- Chip-to-wafer

- Wafer-to-glass, as in CMOS image sensors

The SINR 3170 series and SINR 3570 series are now in production and available for sampling and evaluation by contacting Shin-Etsu MicroSi.

### **About Shin-Etsu**

Shin-Etsu Chemical Co., Ltd., the Tokyo-based chemical company, is the world's largest supplier of semiconductor materials, semiconductor silicon, PVC resin, synthetic quartz glass and methylcellulose and is a major producer of materials including silicones and rare earth magnets. Shin-Etsu Chemical's stock (TSE: 4063) is listed on three markets: The Tokyo, Osaka and Nagoya Exchanges in Japan. <http://www.shinetsu.co.jp>

Shin-Etsu MicroSi Inc. is a wholly owned subsidiary of Shin-Etsu Chemical Co., Ltd. With its headquarters in Phoenix, Arizona, Shin-Etsu MicroSi provides high performance products and materials, specifically designed to address today's photolithography, packaging and flexible printed circuit requirements. [www.microsi.com](http://www.microsi.com)

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