

# Reflow of Photoresist



Version: 2010-01-27

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## Purpose of Reflow of Photoresist Structures

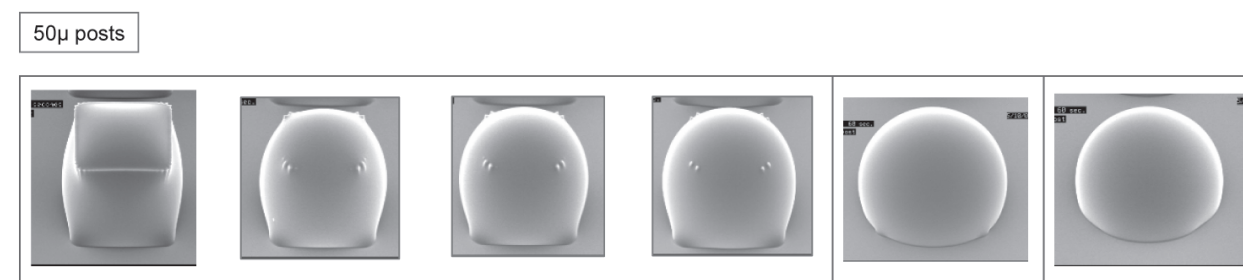
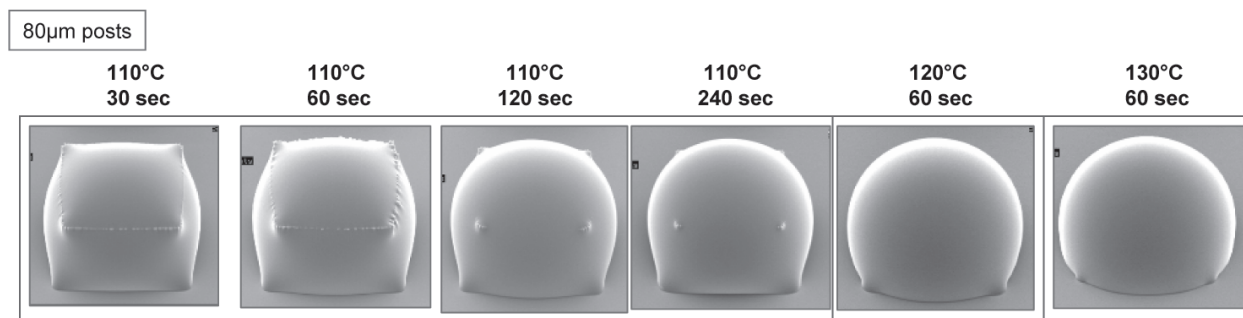
While the thermal softening and rounding (*reflow*) or developed photoresist structures is undesired during e. g. metallization, the reflow is an important and required process steps in micro-optics.

Hereby, the thermal reflow of photoresist structures is often used to transfer lense-shaped structures into the substrates by dry etching. If the substrate is glass or SiO<sub>2</sub>, the transferred features can act as lenses in micro-optic applications.

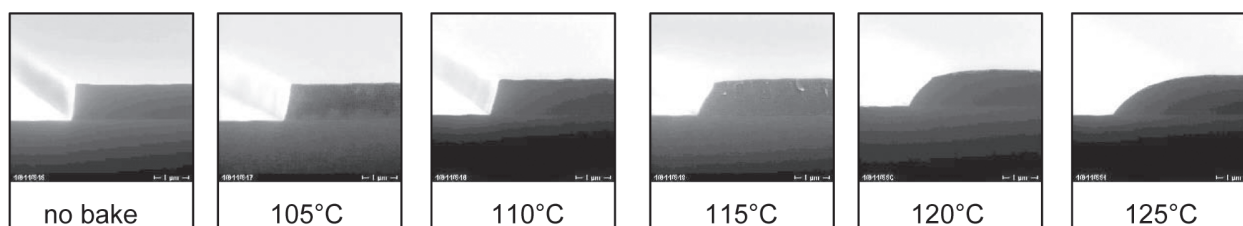
## Photoresists Suited for Reflow

Generally, all resists which do not crosslink, have a certain softening point and thus can be used for reflow. While most negative resists cross-link, all common positive resists do not cross-link and start to soften at approx. 100-130°C.

So, the main criteria for a certain resist is the required resist film thickness: The AZ® 1500 series (resist film thickness range 1-4 µm), the AZ® 4533 (3-5 µm), the AZ® 4562 or 9260



Reflow of AZ® 40 XT cubes at different temperatures and for different time. Images taken from the AZ 40XT-11D Thermal Flow data sheet of AZ-EM.



Cross-section of resist structures at increasing bake temperatures (AZ® ECI 3000). Source: AZ-EM® AZ® ECI 3000 Product Data Sheet

**Photoresists, developers, remover, adhesion promoters, etchants, and solvents ...**

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(5-30  $\mu\text{m}$ ), or the AZ<sup>®</sup> 40 XT (> 30  $\mu\text{m}$ ) have a softening temperature of approx. 110°C, while e. g. the AZ<sup>®</sup> 6600 series, the AZ<sup>®</sup> 5214E, or the AZ<sup>®</sup> 701 MiR start rounding from approx. 130-135°C .

The document [Photoresists, Developers, and Removers](#) gives a detailed overview on the processing and typical fields of application of these resists, the document [Thick Resist Processing](#) focuses on the processing of the thick resists AZ<sup>®</sup> 4562, 9260, or 40 XT.

### Interested?

We supply all mentioned resists also in 250 ml, 500 ml, and 1.000 ml units. Please contact us for further information!

### Disclaimer of Warranty

All information, process guides, recipes etc. given in this brochure have been added to the best of our knowledge. However, we cannot issue any guarantee concerning the accuracy of the information.

We assume no liability for any hazard for staff and equipment which might stem from the information given in this brochure.

Generally speaking, it is in the responsibility of every staff member to inform herself/himself about the processes to be performed in the appropriate (technical) literature, in order to minimize any risk to man or machine.

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