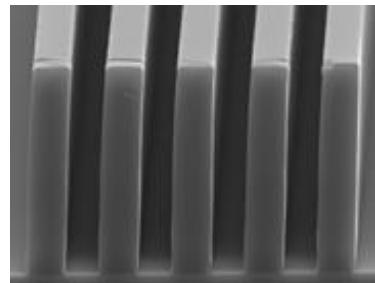
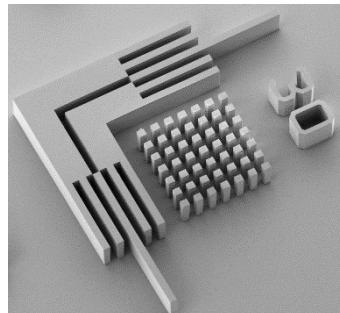
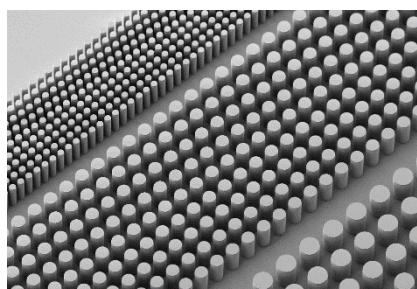


SQ Series

High Aspect Ratio SU-8 Epoxy Photoresist Film Thickness 2-100 microns



DESCRIPTION

SQ is an epoxy-based negative photoresist designed for polymeric MEMS, microfluidics, micromachining, and microelectronics. It is optimized for thick film applications from 2 to 100 microns. SU-8 epoxy photoresists create durable images with superior chemical and thermal stability, crucial for thick applications. The SQ Series has vertical sidewalls in thick films suitable for permanent applications.

ADVANTAGES

- KemLab SU-8 epoxy photoresists use an epoxy resin manufactured for microelectronics with superior cleanliness and excellent lithographic reproducibility from lot-to-lot compared to SU-8 legacy products
- Consistent surface energy of crosslinked resist critical for microfluidic applications
- Fully compatible with SU-8 processes

FEATURES

Chemistry: SU-8 polymer epoxy

Tone: Negative

Film Thickness: Up to 100 μm single coat

Sensitivity: NUV, Broadband, i-line

Developer: SQ Developer, SU-8 PGMEA

PROCESSING GUIDELINES

Product	Film Thickness @ 2000 rpm	Softbake	Exposure Broadband on Si with 360nm filter	Post Exposure Bake (PEB)	Develop Immersion
SQ 2	2 μm	65°C for 1 min 95°C for 1 min	200 mJ/cm^2	65°C for 1 min 95°C for 2 min	1 min
SQ 5	5 μm	65°C for 1 min 95°C for 3 min	180 mJ/cm^2	65°C for 1 min 95°C for 2 min	1 min
SQ 10	10 μm	65°C for 2 min 95°C for 5 min	180 mJ/cm^2	65°C for 1 min 95°C for 2 min	2.5 mins
SQ 25	25 μm	65°C for 3 min 95°C for 7 min	180 mJ/cm^2	65°C for 1 min 95°C for 3 min	3.5 mins
SQ 50	50 μm	65°C for 5 min 95°C for 15 min	180 mJ/cm^2	65°C for 1 min 95°C for 5 min	6 mins
SQ 50	100 μm	65°C for 10 min 95°C for 30 min	180 mJ/cm^2	65°C for 2 min 95°C for 10 min	15 mins

PROCESS FLOWCHART

SUBSTRATE PREP → COAT → EDGE BEAD REMOVAL → SOFTBAKE → EXPOSE → POST-
 EXPOSURE BAKE (PEB) → DEVELOP → RINSE & DRY → HARDBAKE

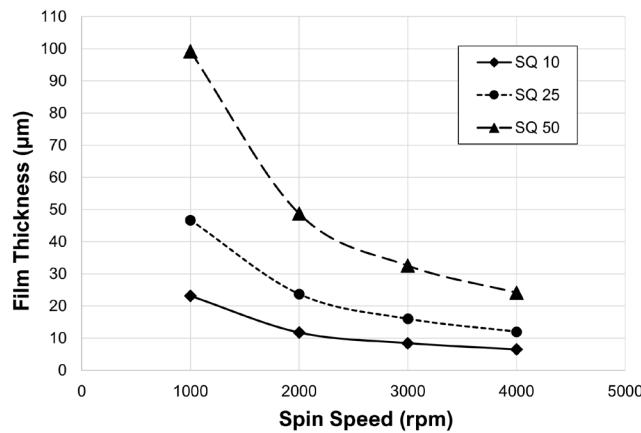
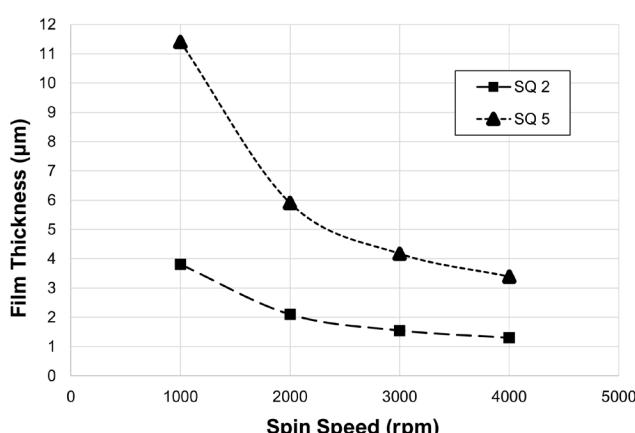
SUBSTRATE PREPARATION

SQ Series adheres to variety of substrates; including silicon, gold, aluminum, glass, and chromium. For maximum adhesion, substrates should be clean and dry prior to applying SQ epoxy photoresist.

COAT

Spin Coat: Film thickness is targeted using the spin speed curve shown below. The coat program uses a 5 - 10 second spread cycle. Spin time at final speed is 30 seconds.

Coat techniques such as spray coat, slot coating, and other additive techniques are possible; please contact techsupport@kemlab.com for more information.



EDGE BEAD REMOVAL

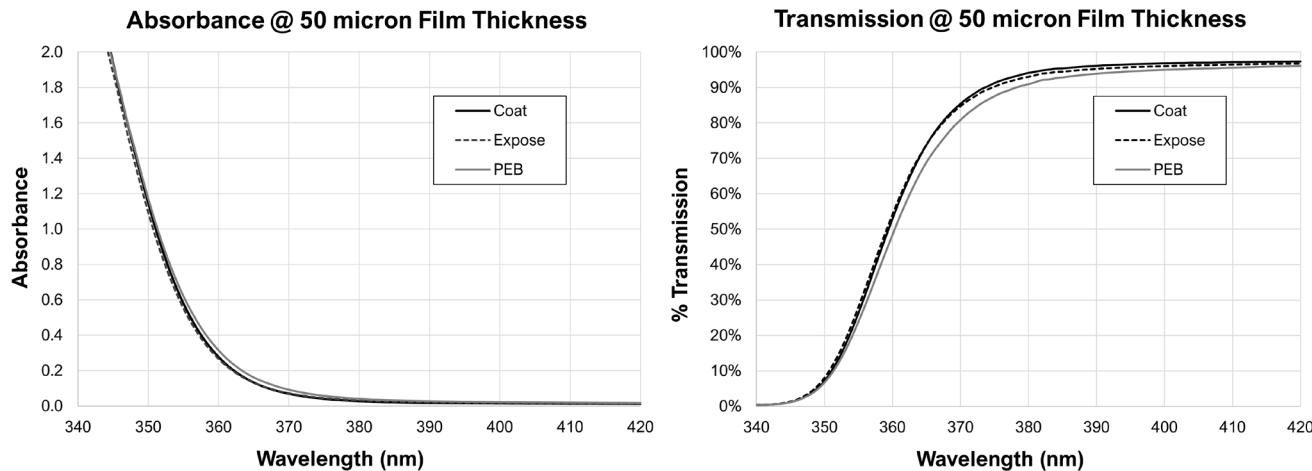
Photoresist may accumulate at the substrate's edge during the spin coating procedure. It is necessary to remove this thick edge bead to reduce hotplate contamination. A stream of solvent such as KL EdgeClean EBR applied to the wafer edge from the top or bottom can be used to remove the edge beads. Most automated spin coaters have this feature now and can be configured to remove edge beads automatically. By removing the edge bead, the photomask can be positioned closer to the wafer, improving aspect ratio and resolution.

SOFTBAKE

The recommended softbake for the SQ Series utilizes a two-step bake on a contact hot plate to minimize film stress and adhesion issues. See Process Guide Table for details.

EXPOSURE & OPTICAL PARAMETERS

SQ is designed for near UV (350-400nm) exposure wavelengths. Exposure dose will vary depending on the exposure tool set, film thickness, and process conditions. Nominal exposure doses are shown in the Process Guide for broadband exposure with a 360nm cutoff filter at the thicknesses and processes shown.



POST-EXPOSURE BAKE (PEB)

Recommended PEB time is adjusted according to film thickness in order to ensure sufficient crosslinking of the resist film. A two-step PEB is recommended to reduce film stress which can lead to cracking and/or adhesion loss. See Process Guide Table for details.

DEVELOP

SQ is designed for use with KemLab SQ developer. It can be developed using immersion, puddle or spray puddle. Thicker films benefit from refreshing developer during the develop step; such as with a double puddle.

Rinse developer off substrate with isopropyl alcohol (IPA) and dry. See Process Guide Table for details.

HARDBAKE

SQ can be hardbaked for permanent applications that would benefit from further crosslinking.

Bake at > 120°C for at least 5 minutes (hot plate). A short hardbake can fuse cracks caused by film stress.

For permanent structures, temperatures above 150°C are recommended. Oven bake will increase crosslinking with minimal increase in stress.

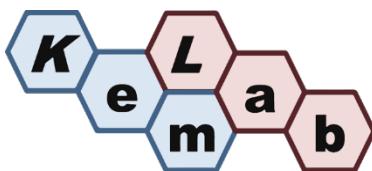
STORAGE

Avoid light and store in an upright airtight container at 4–21°C or room temperature. If refrigerated, bring up to room temperature before opening. Keep resist away from oxidizers, acids, bases and sources or ignition.

HANDLING & DISPOSAL CONSIDERATIONS

Consult the SDS for handling and appropriate PPE. SQ epoxy photoresist contains a combustible liquid; keep away from ignition sources, heat, sparks and flames. This SQ epoxy photoresist is compatible with typical waste streams used with photoresist processing. It is the user's responsibility to dispose in accordance with all local, state, and federal regulations.

DISCLAIMER: The information is based on KemLab experience and is, to the best of our knowledge, accurate and true. We make no guarantee or warranty, expressed or implied, regarding the information, use, handling, storage, or possession of these products, or the application of any process described herein or the results desired, since the conditions of use and handling of these products are beyond our control.



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