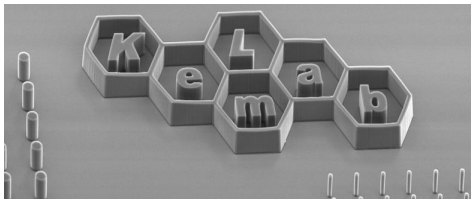
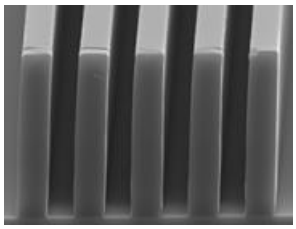
SQ OptiCoat

Optical Grade SU-8 Epoxy Photoresist

Film Thickness 2 - 100 microns





DESCRIPTION

SQ OptiCoat is an advanced epoxy-based negative photoresist for permanent devices with demanding optical parameters such as waveguides and sensors. SQ OptiCoat is an improved version of SQ. Using patent-pending advanced chemistry, higher transparency can be maintained over a wide temperature range. Film thicknesses of 2 to 100 microns can be achieved with a single spin coat.

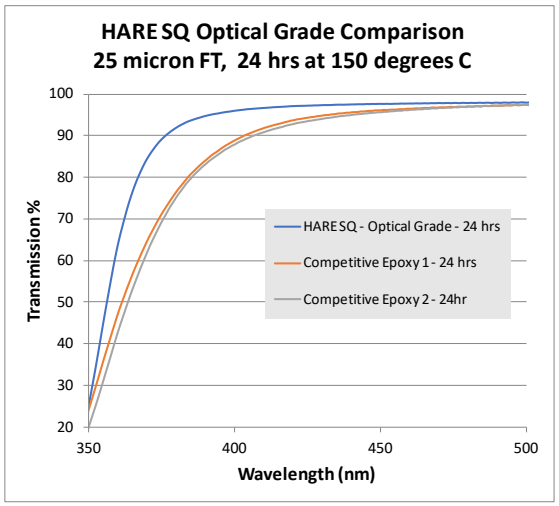
ADVANTAGES

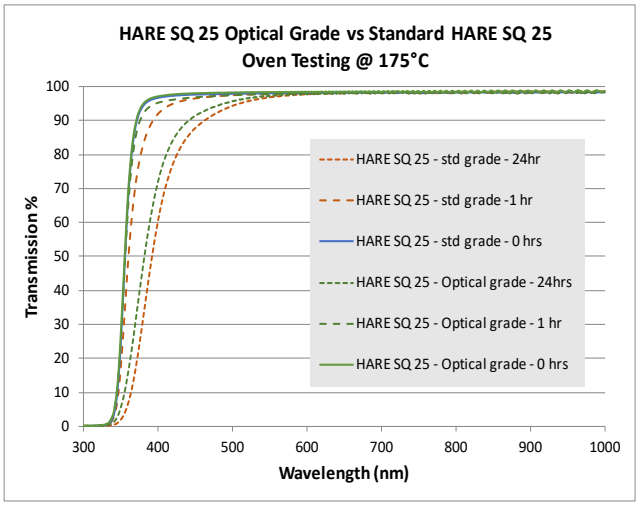
- KemLab SU-8 epoxy photoresists use an epoxy resin manufactured for microelectronics with superior cleanliness and excellent lithographic reproducibility lot-to-lot compared to SU-8 legacy products
- Improved optical stability
- Reduced oxidative stress
- Fully compatible with SU-8 processes

FEATURES

Chemistry:	SU-8 polymer epoxy
Tone:	Negative
Film Thickness:	Up to 200 µm single coat
Sensitivity:	NUV, Broadband, i-line
Developer:	SQ Developer, SU-8 PGMEA

Shown below SQ OptiCoat optical stability at 150°C and 175°C





PROCESS FLOWCHART

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

PROCESSING GUIDELINES

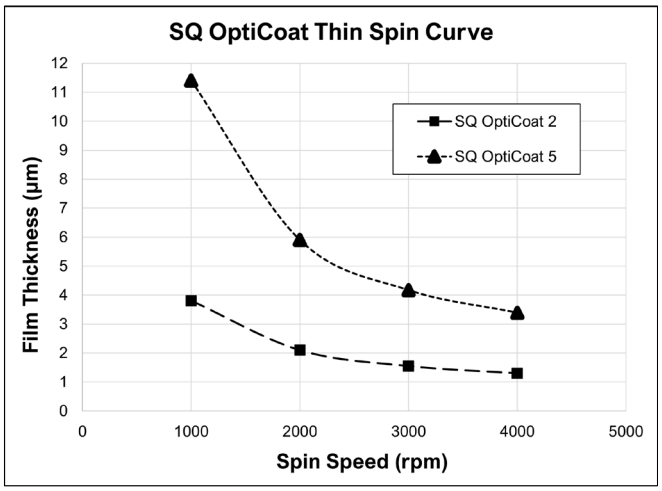
Product	Film Thickness @ 2000 rpm	Softbake	Exposure Broadband on Si with 360nm filter	Post Exposure Bake (PEB)	Develop Immersion
SQ OptiCoat 2	2 µm	65°C for 1 min 95°C for 1 min	200 mJ/cm^2	65°C for 1 min 95°C for 2 min	1 min
SQ OptiCoat 5	5 µm	65°C for 1 min 95°C for 3 min	180 mJ/cm^2	65°C for 1 min 95°C for 2 min	1 min
SQ OptiCoat 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 OptiCoat 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 OptiCoat 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 OptiCoat 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

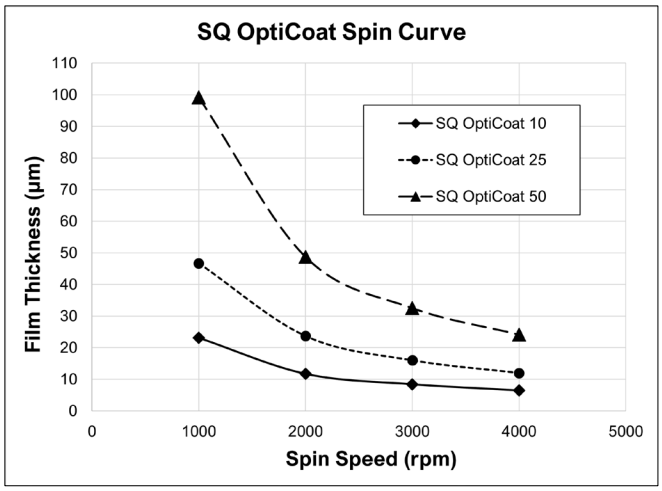
SUBSTRATE PREPARATION

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





SOFTBAKE

The recommended softbake for the SQ OptiCoat 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 OptiCoat is designed for near UV (300-400nm) 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 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 OptiCoat 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 OptiCoat 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 4–21ºC 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.

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