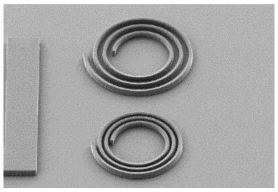
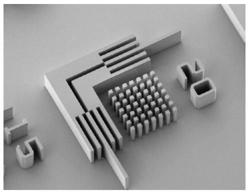
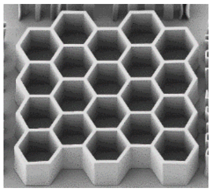
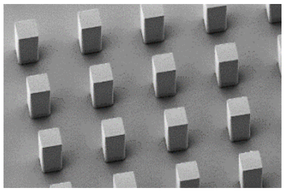
Advanced SU-8 Epoxy Photoresist

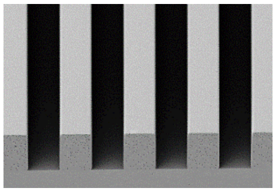
Film Thickness 2 - 120 microns











DESCRIPTION

SQ Nova 3K is a high-performance, epoxy-based negative photoresist designed for high-precision applications such as micromachining, microfluidics, and MEMS. Advancing earlier SQ SU-8 technologies, it delivers improved adhesion, lower intrinsic film stress, faster processing, and sharply defined vertical sidewalls. The material supports crosslinked film thicknesses from 2 to 120 µm in a single spin coat and enables high-aspect-ratio structures of up to 10:1. It also provides excellent optical clarity, with strong transmission above 400 nm.

SQ Nova 3K is an advanced evolution of SQ SU-8 photoresist, engineered with upgraded materials to deliver superior performance. Its formulation uses MMP solvent, a non-PFAS surfactant, and electronic-grade epoxies to improve reliability and consistency. MMP is less toxic and less polar, enabling faster drying, uniform coatings, and shorter development times.

ADVANTAGES

- Superb adhesion and reduced film stress
- High-contrast, high aspect ratio patterning
- Vertical sidewall profiles suitable for MEMS and microfluidic devices
- Less toxic, less polar, fast-drying solvent
- Clean, efficient development with reduced develop times
- Microelectronics-grade epoxy resin for superior cleanliness and excellent lot-to-lot lithographic reproducibility
- Enhanced alternative to SU-8 3000

FEATURES

Chemistry:	SU-8 polymer epoxy
Solvent:	MMP (methyl 3-methoxypropionate, CAS 3852-09-3)
Tone:	Negative
Film Thickness:	Up to 120 µm single coat
Sensitivity:	NUV, Broadband, i-line
Developer:	SQ SU-8, SU-8
Products:	SQ Nova 3K 2, 5, 10, 25, 50

PROCESSING GUIDELINES

Product	Film Thickness Range	Softbake	Exposure Broadband on Si with 360nm filter	Post Exposure Bake (PEB)	Develop Immersion
SQ Nova 3K 2	1.5 - 3.2 µm	95°C for 2 mins	270 mJ/cm^2	95°C for 2 mins	30 sec
SQ Nova 3K 5	4 - 9 µm	95°C for 3 mins	270 mJ/cm^2	95°C for 3 mins	1 min
SQ Nova 3K 10	8 - 20 µm	95°C for 4 mins	270 mJ/cm^2	95°C for 3 mins	90 sec
SQ Nova 3K 25	18 - 65 µm	95°C for 10 mins	240 mJ/cm^2	95°C for 4 mins	3 mins
SQ Nova 3K 50	35 - 120 µm	95°C for 15 mins	270 mJ/cm^2	95°C for 5 mins	Bath 1: 4 mins Bath 2: 1 min

PROCESS FLOWCHART

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

PRODUCT VISCOSITY

Product	Approx % Solids	Approx Viscosity (cSt)
SQ Nova 3K 2	38	11
SQ Nova 3K 5	53	59
SQ Nova 3K 10	63	270
SQ Nova 3K 25	74	3360
SQ Nova 3K 50	77	8300

SUBSTRATE PREPARATION

SQ Nova 3K adheres well to a variety of substrates including silicon, SiO_2, glass, gold, and aluminum. For optimal adhesion and pattern fidelity, substrates must be clean and dry prior to resist application.

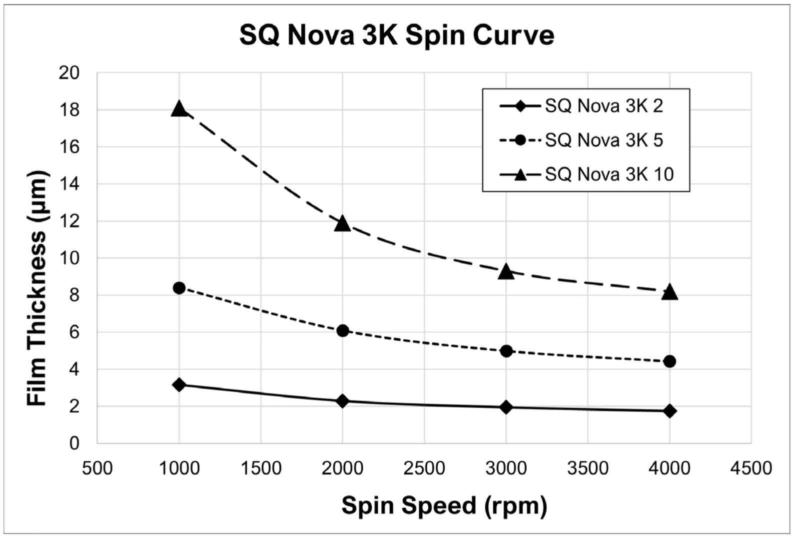
COAT

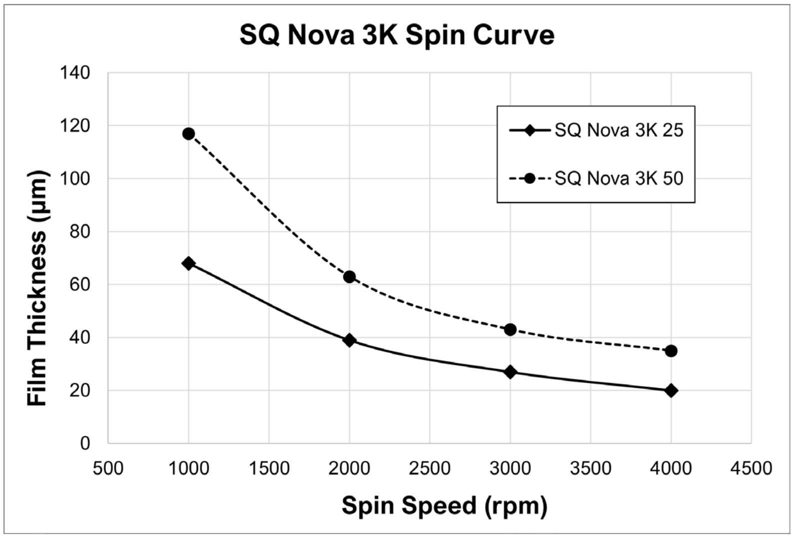
Spin Coating

Film thickness is controlled through spin speed selection using spin speed curves. A typical spin program includes:

1. Dispense ~ 1 ml / 25 mm (1 inch) of substrate diameter
2. Spread Cycle: 1000 rpm for 5 – 10 seconds
3. Spin Cycle: Target rpm for 30 seconds with acceleration of 1000 r/s

Alternative coating techniques such as spray coating, slot coating, and other coating methods may be used. Contact techsupport@kemlab.com for application-specific guidance.





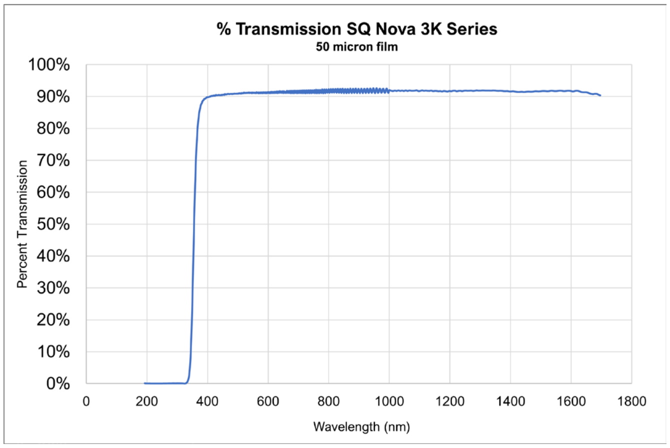
SOFTBAKE

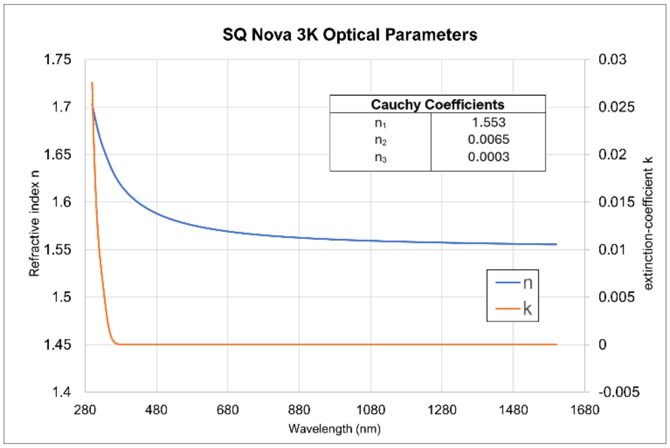
Softbake conditions are adjusted as a function of film thickness. See Process Guide Table for details.

Recommended bake times are optimized for contact hotplates (no vacuum); convection oven bakes may also be used. SQ Nova 3K has a wide soft-bake process latitude, allowing for various bake times and bake temperatures.

EXPOSURE & OPTICAL PARAMETERS

SQ Nova 3K is optimized for near-UV exposure (300–400 nm). Exposure dose depends on film thickness, exposure tool, and process conditions. Nominal doses listed in the Process Guide are based on broadband exposure with a 360 nm long-pass filter (e.g., Omega Optical PL-360-LP).





POST-EXPOSURE BAKE (PEB)

Recommended Single PEB temperature and PEB time is adjusted according to film thickness to ensure sufficient crosslinking of the resist film. Two-stage PEB is not needed. See Process Guide Table for details.

DEVELOP

SQ Nova 3K is designed for use with KemLab SQ SU-8 Developer and is fully compatible with SU-8 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: (optional) Rinse developer off substrate with isopropyl alcohol (IPA) and dry. See Process Guide Table for details.

HARDBAKE (OPTIONAL)

SQ Nova 3K may be hardbaked to enhance crosslink density and mechanical stability for permanent structures.

- Minimum: >120 °C for ≥5 min (hotplate)
- Recommended for permanent applications: 150–200 °C

A short hardbake may also reduce stress-related microcracking.

STORAGE

Avoid light and store in an upright airtight container at 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 Nova 3K epoxy photoresist contains a combustible liquid; keep away from ignition sources, heat, sparks and flames. This SQ Nova 3K 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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