

Lithographically Defined SU-8 Membranes

ID: 2015-075

Executive Statement:

An innovative manufacturing process for epoxy-based membranes with precisely defined porosity characteristics.

Technology Overview:

This technology outlines the creation of epoxy-based membranes using lithography, featuring two distinct layers: a porous membrane layer and a supportive grid layer. The membrane layer possesses holes with diameters between 5-10 micrometers, achieving an open area of around 50%, while the support layer is designed with 30-micrometer wide ribs spaced 130 micrometers apart, resulting in a 25% open area. These membranes can be produced in sheets up to 4 inches in diameter, leveraging established lithographic techniques for scalability.

Key Advantages:

- High precision in pore size and distribution, enabling tailored filtration properties
- Scalable production process compatible with existing lithographic techniques
- Optimal balance between strength and porosity due to the unique two-layer design
- Capability to manufacture large sheets up to 4 inches in diameter

Problems Addressed:

- Limitations in the customization of membrane pore sizes and total open areas
- Challenges in scaling up the production of precisely defined membranes
- Difficulty in achieving a balance between membrane porosity and structural integrity

Market Applications:

- Water filtration and purification systems
- Chemical processing industry for selective separation processes
- Biomedical applications, including drug delivery systems and artificial organs
- Microfluidic devices for laboratory and medical diagnostics