



FILTRATION

Target Market:

Microelectronics

Application:

Photoresist Prefiltration

Application Description

Photoresist is an energy sensitive emulsion used to create the circuit pattern on a wafer. It is manufactured from energy sensitive resin, solvent and surfactant. The photoresist is coated onto a wafer and then exposed to an energy source (light, UV light, X-ray) through a glass on which the negative of the circuit pattern is formed. The energy changes the exposed photoresist so it is resistant to the liquids used to remove the undeveloped photoresist. The wafer is then etched to remove the insulating SiO₂ so the conducting ions can be added to the silicone. The wafer must be free of gels, particles, organic and inorganic contaminants that impede its ability to form the resistant film (when exposed to the energy source) or create voids in the film causing circuit defects. Filtration is critical to the elimination of gel and particle contaminants but can be the source of organic and inorganic contaminants. Several prefiltration steps are often required to get the photoresist clean enough to cost-effectively go through the 0.1 micron (or smaller) final filter.

Material: Porous Polyethylene

Types of Filters Used

Historically, the final filters used in photoresist prefiltration applications have been pleated polypropylene membrane cartridges. Recently, the industry has moved toward pleated high-density polyethylene due to its better chemical resistance to solvents, which reduces organic and inorganic extractables. The prefilter is typically depth or pleated meltblown polypropylene since high-density polyethylene prefilters had not been available.

Purpose of Filtration

The primary purpose of filtration is to remove gels and particulate from the photoresist without adding organic, inorganic or particulate contamination.

Common Filtration-Related Problems

- Contaminated photoresist caused by filter extractables
- Premature plugging of the final filters caused by inadequate prefiltration
- High-density polyethylene unavailable as a prefilter
- Premature plugging of the prefilters caused by low surface area

Sintered High-Density or Ultra-High Molecular Weight Polyethylene

FEATURE	ADVANTAGE	BENEFIT
Rigid, Omni-Directional Pore Structure		
• Absolute Ratings	• Consistent pore structure minimizes performance changes caused by differential pressure	• Reproducible performance
• Narrow Pore Size Distribution	• Highly-effective surface filtration for particles larger than the filter pore size rating	• Allows for effective cleaning, backwash and reuse
• Thermally-Bonded	• Sintered omni-directional pore structure	• No media migration, bypass or unloading from 5 to 100 microns
• Excellent Chemical and Thermal Compatibility	• High chemical resistance of HDPE and UHMWPE • Completely incineratable with a high BTU output	• No chemical degradation resulting in bypass or contamination of the process fluid • No incineration residue
Unique, Molded Radial Design		
• High Surface Area	• Low pressure drop and higher flow rate	• Increased life or fewer filters results in lower filtration costs
• Open Channels	• Easy access to filtration area	• Effective filtration and cleaning
• Single-Layer Structural Media	• Eliminates unnecessary support materials	• Improves backwash and cleanability
• Rigid, One-Piece Construction	• Multiple diameters, lengths and end configurations	• Easily adapts to existing filtration systems

PERFORMANCE COMPARISON

Rigid, Omni-Directional Pore Structure			Unique, Molded Radial Design		
POREX Radial Cartridge Filter vs	Depth Cartridges	Pleated Cartridges	POREX Radial Cartridge Filter vs	Depth Cartridges	Pleated Cartridges
Micron Rating	= / -	= / -	Backflushable	+	+
Absolute Filtration	= / +	= / +	Surface Area	+	-
Surface Retention	= / +	+	Molded Construction	+	+
Classification Filtration	= / +	+	Rigid Structure	= / +	+
Sintered Process	+	+	Open Pleats	+	+
Polyolefin Material	=	=	Disposal Cost	+	+
Chemical Compatibility	=	=	Performance Priced	+	+
Thermal Compatibility	=	=	Single Material	=	= / +
			Vessel Seal	=	=
			Housing Fit	=	=

Symbol Key: = Porex equivalent + Porex advantage - Porex potential limitation

