



## FILTRATION

Target Market:

## Coatings

Application:

Base and Top Coat Paints

### Application Description

Specialty paints are used to create the color and luster on vehicles and to protect them from the elements. The paints used in this application are primarily lead-free, aqueous-based liquids containing resin, pigment, solvent and surfactant. Paints are stored in kettles in a paint kitchen. The paint is continuously agitated, and then pumped through a filter to the robotic spray paint booth. The paints are frequently recirculated back to the paint kettle. The robotic spray system cleans the spray system with solvent prior to introducing the specific paint for the vehicle. After the vehicle is painted, the excess paint is sprayed out and solvent is reapplied prior to introducing a new color or luster into the system. In this type of system, the solvents and paints are filtered down to approximately five microns to prevent paint defects, nozzle clogs, uneven coatings and improperly-sized pigment dispersion. Defective vehicle painting can cost \$1,000/vehicle or more.

**Material:** Porous Polyethylene

### Types of Filters Used

Historically, the most common filter used in base and top coat paint applications are nylon monofilaments. Pleated cartridge filters using a woven screen material have been introduced in recent years to provide more surface area for longer life.

### Purpose of Filtration

The primary purpose of filtration is to remove particles caused by agglomerated pigment, resin or dirt. This particulate contamination can cause paint defects such as stars, lumps, rough areas, splatters and spits. Every vehicle is inspected for these defects. The filter cannot be so efficient as to remove the wanted pigments (such as metallic fleck paints). Throughout its life, the filter should effectively remove all particles big enough to cause paint defects or nozzle clogging. The filter should not be so tight (efficient) that it removes the desired pigments and resins. Many filters get more efficient during their life due to the accumulation of particulate. This can be detrimental to specialty paint application. Some filters remove a broad range of particles above and below their respective ratings. Filters that effectively only remove particles at and above their rating while allowing the smaller particles to pass through are called classifying filters. Ideal for this type of application, classifying filters are particularly effective if they maintain their efficiency over a significant portion of their life.

### Common Filtration-Related Problems

- **Fish Eyes** - Defects caused by lubricating oils (silicone) sometimes found on filters to assist in the manufacturing process
- **High Filter and Paint Usage** - Premature plugging caused by contaminated paint, tight and/or low surface area filters resulting in high filter usage and lost paint (filter change outs can result in \$100,000 in lost paint)
- **Stars and Rough Surfaces** - Surface defects caused by particles passing through the filter due to improper sealing, migration or too large a pore size
- **Spits, Splats, Uneven Coatings, Nozzle Plugging** - Plugged spray nozzle caused by particles passing through or around the filter
- **Uneven or Lack of Coating** - Plugged filter caused by lack of sufficient paint or pressure to operate the spray nozzle
- **Paint Carry Over** - Plugged solvent filter caused by insufficient system cleans between colors

Sintered High-Density or Ultra-High Molecular Weight Polyethylene

FEATURE	ADVANTAGE	BENEFIT
<b>Rigid, Omni-Directional Pore Structure</b>		
· 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
<b>Unique, Molded Radial Design</b>		
· 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	Bags	Depth Cartridges	Pleated Cartridges	POREX Radial Cartridge Filter vs	Bags	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

