



F I L T R A T I O N

Target Market:

## Pulp and Paper

Application:

### White Water Filtration

#### Application Description

Cellulose, glass, polyester, acrylic or other fibers are taken from bales and used as provided or cut/fibrillated to create finer fibers. A slurry of water and these fibers is produced in a mixer. Once the desired consistency, solids and distribution are reached, the slurry is sprayed onto a porous belt or fixed screen. Gravity and a vacuum then remove most of the water, leaving behind the fibers in a random matrix of a desired weight. The fibrous material is then calendared to squeeze out most of the remaining water and establish the paper's thickness. Resin is applied, the remaining water is removed and the resin is cured in an oven. The water that is removed via the vacuum system is moved to a storage tank where it will be reused again to make the paper slurry. This stored water still has fibers that have gone through the porous belt or screen due to size or orientation. Once in the storage tank, the fibers separate from the water by settling or floatation. Over time, the fibers accumulate in the tank and must be cleaned out periodically to ensure consistent paper quality.

**Material:** Porous Polyethylene

#### Types of Filters Used

Initially, filtration was not used in white water applications. Paper producers periodically dealt with the problem by draining the tank and physically removing the built-up fiber mass. In recent years, backflushable metal filters have been used to keep the tank cleaner and concentrate the fiber mass. R-P has been the leader in this technology. While the process is capable of regeneration, the initial and replacement filters are expensive.

#### Purpose of Filtration

The primary purpose of filtration is to remove fibers that have gone through the porous belt or screen prior to the storage tank. The volume of water utilized and the amount of fiber make it difficult for many filtration processes.

#### Common Filtration-Related Problems

- High maintenance costs caused by fiber fines bleeding through the filter
- Mechanical cleaning, filter damage and high maintenance costs caused by fiber entanglement in screen filters
- Reduced flow rate at optimum retention efficiency or high filter element usage caused by low surface area
- Expensive initial and replacement metal elements

#### Execution Plan

Establish trials at major paper manufacturers to establish business, show functionality and nail down advantages. Expand successes to the broader market.

**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**

POREX Radial Cartridge Filter vs	Bags	Depth Cartridges	Pleated Cartridges	Metal Cartridges
Micron Rating	= / -	= / -	= / -	= / -
Absolute Filtration	= / +	= / +	= / +	=
Surface Retention	= / +	= / +	+	=
Classification Filtration	+	= / +	+	+
Sintered Process	+	+	+	=
Polyolefin Material	= / +	=	=	+
Chemical Compatibility	=	=	=	= / -
Thermal Compatibility	=	=	=	= / -

**Unique, Molded Radial Design**

POREX Radial Cartridge Filter vs	Bags	Depth Cartridges	Pleated Cartridges	Metal Cartridges
Backflushable	+	+	+	=
Surface Area	+	+	-	+
Molded Construction	+	+	+	+
Rigid Structure	+	= / +	+	=
Open Pleats	+	+	+	+
Disposal Cost	-	+	+	+
Performance Priced	+	+	+	+
Single Material	= / +	=	= / +	+
Vessel Seal	+	=	=	=
Housing Fit	-	=	=	= / -

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

