



FILTRATION

Target Market:

Precious Metal Refining

Application:

High Value or Hazardous Metal Recovery from Solutions

Application Description

In the process of manufacturing or recycling high value or hazardous metals, liquids are created that contain particulate metals, metal oxides or other metallic salts. The goal of the manufacturer or recycler is to recover the material's economic value for sale or reuse or to reduce its cost of disposal. The particulate involved in many of these processes is fairly fine (<10 micron) and failure to retain them can be very costly. For hazardous wastes the particulate can be collected on the filter for later disposal in a more highly concentrated and economical form. For metal recovery the collected particulate can be either incinerated or backflushed, creating a concentrated stream for subsequent dewatering. The non-combustible product of the incineration is the desired metal. This process is done at a number of locations including the primary metal refiner, film manufacturers, centralized recovery and refining facilities, source-based recovery and refining facilities. The source solutions can be from the base process, plating solutions, film processing solutions, and new and used film silver recovery.

Material: Porous Polyethylene

Types of Filters Used

Depending on the metal, fluid, temperature and subsequent processing, liquid filter bags, depth and pleated cartridges, and metallic tubular elements and cartridges are used in precious metal refining applications.

Purpose of Filtration

The metallic particulate is of value either as a product (silver, gold, platinum, palladium, etc.) or as a cost of waste. In either case, the purpose of filtration is to effectively remove these particulates from the solution to minimize product loss and waste disposal cost or to meet environmental regulations. In any case, the cost of the filter is inconsequential compared to the cost of the product or its failure to comply with governmental regulations. Another function of the filter is to capture the particulate in such a way that the subsequent processes are facilitated. This includes disposal (volume minimization), backflushing or incineration.

Common Filtration-Related Problems

- **Retention Failure** - Loss of valuable product or undesirably high level in the filtrate caused by metallic particulate passing through or around the filter
- **High Filter Usage** - Premature plugging caused by variations in concentration and size of the metallic particulate that requires system shut down or use of a parallel vessel
- **High Volume of Waste for Disposal** - Insufficient quantity of waste per area: too long, or large horizontal area unutilized resulting in less economical utilization of disposal drums
- **Limited Recovery on Backflushing** - The surface pore size is too large, the filter has a gradient density, the filter holds the contaminant on the filter or filter supports, its differential pressure has gotten too high, or it is incapable of an appropriate backflush pressure
- **Undesirable Contaminant in the Incineration By-Product** - Some filters have materials that are either non-combustible or have high combustion temperatures leaving them as a residue with the desired product
- **High Incineration Energy Consumption** - Some materials require a lot of heat/energy for complete combustion

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	Bags	Depth Cartridges	Pleated Cartridges	Metal Cartridges	POREX Radial Cartridge Filter vs	Bags	Depth Cartridges	Pleated Cartridges	Metal 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

