Target Market:

Printed Circuit Board Manufacturing

Application:

High Value or Hazardous Metal Recovery from Plating and Rinse Bath Solutions

Application Description

The PCB manufacturing process uses many chemical, physical and electrochemical processes to cut, drill, plate, and etch metallic and non-metallic subsurfaces. Filtration applications focus primarily on the chemical and electrochemical processes. In the process of manufacturing or recycling high value or hazardous metals, printed circuit boards involves the immersion of workpieces into a series of process baths, with each step followed by a rinsing step. A typical electroless copper plating process line will contain steps such as Solder stripping, Mild etching, Surface conditioning and catalyzing, and Electroless copper platting. Each of these four steps will have one or more process baths, with each followed by a rinsing step. The goal of the manufacturer is to recover the material's economic value for sale or reuse or to reduce its cost of disposal. The high value or hazardous particulate involved in many of these plating and rinsing processes can range from large (>50 micron) to 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.

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

POREX

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	· No chemical degradation resulting in bypass or contamination of the process fluid
	· Completely incineratable with a high BTU output	· 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

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

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