Electrolytic Copper Foil Filtration Application

Filter applications

High Precision

Feature-Tec Filtration System

Strainers, cartridge & bag filters are commonly used today for electrolyte filtration processes. As manual washing and change-out is complex, element change-out frequency and air pollution reduction.

Feature-Tec’s 0.5 μm filter effectively removes particles from the process, providing a high level of filtration. The micron rating of the filter element allows for effective particle retention, ensuring high filtration efficiency.

Secondary filter surface, removing smaller particles. When the particulates accumulate to form the filter cake. The filter cake acts as a holding capacity and longer service life.

Filter Applications

- High Precision
- Electrolytic Copper Foil
- Filtration System

Technical Specifications

- Micron Rating: 1, 5, 10, 20, 40, 70, 100 μm
- Nominal Filtration: 2 layers
- Water
- Oil, Water & Emulsion
- Corrosion Contamination
- Oils & Grease

Features: Advantages: Benefits:

- Assures copper quality
- Improves electrolyte purity
- Removes particles & pump oil
- Effectively filters electrolytes
- High Efficiency
- Fully automatic
- Minimal manual operation
- Jumbo Filter
- Large filtration area
- Long service life
- High precision
- Large holding capacity
- Long service life
- Reduces risk of side leakages
- Better temperature and acidic tolerance for product quality
- Life reduces replacement downtime
- Low equipment investment cost
- Longer service life
- Jumbo Filter System
- Extends the service life of the filter system
- As treatment of copper foils requires many complex steps involving circulating washing liquids, the filter system extends the service life of the filter system.

Operating Conditions

- Max. Operating Temperature: 90℃
- Max. Operating Pressure Drop: 3.5 kg/cm²

Additives

- Oil Absorption
- Dosing Liquid
- Oxidizing Solution

Filter Bag

- Oil Absorption
- Filter Aid
- Conical cap seal
- PP / PE material
- Better temperature and acidic tolerance for product quality
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Filter Aid

- Adhesive filter aid for high viscosity fluids
- Aids in filter cake formation

Diatomite

- Adsorbs organic substances
- Aids in filter cake formation

Rocket 1μm

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HT Series

- Cartridge Material: Polypropylene
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- Oil, Water & Emulsion
- Corrosion Contamination
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Feature-Tec

Feature-Tec is an internationally recognized provider of filtration & separation technology, encompassing engineering consultation, design, production, sales and services. Through our commitment in delivering process flow and energy optimization technology to our clients, Feature-Tec has solved numerous system integration cases for filtration & separation requirements, solidifying Feature-Tec’s reputation and credibility in the industry.

Since our founding in 1999, Feature-Tec has established multiple R&D centers, management offices and factories across the world to develop catalyst recovery, flue gas purification and industrial waste water filtration technology.

Engineers around the world from Feature-Tec Group has applied for over 50 patents developed through continual pursuit of technological and product innovation to advance our filtration and separation technology. Feature-Tec is certified to produce vessels to ASME, NBBI, CE & GOST standards, and is a certified ISO9001, ISO14001 & ISO18001 organization.

We are committed to developing filtration & separation technology for environmental purification in various industries, providing clients worldwide with their ideal safe & efficient products and services.

Feature-Tec drafted the following standards:

National Standard: GB/T 26114-2010 Liquid Filtration System General Technical Specifications
National Standard: GB/T 30176-2013 Liquid Filtration System Performance Test Methods
Industrial Standard: JB/T 11713-2013 Bag Filters for Liquid Applications
Industrial Standard: JB/T 12310-2015 Cluster Type Pipe Back-blowing Filter System

ASME  NBBI  CE  GB-150  CU-TR
Copper is widely used in lithium-ion batteries and printed circuit boards for its conductive properties. As copper is developing into thinner, high ductility foils for use in the electronics industry today, electrolyte purification is increasingly important to improve the quality of copper foil. Feature-Tec has various solutions to reduce operational complexity, element change-out frequency and air pollution reduction.

### Contaminants of Copper

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Source</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particulates Oil, hydrocarbons, etc</td>
<td>Feed &amp; pipeline corrosion</td>
<td>Pitting, holes in</td>
</tr>
<tr>
<td></td>
<td>contamination</td>
<td>copper foil</td>
</tr>
</tbody>
</table>

### Time Consuming & Complex Maintenance

Strainers, cartridge & bag filters are commonly used today for electrolyte filtration processes. As manual washing and change-out is required for these filters, the complicated process exposes personnel to harmful particles. This issue can be negated by using larger housings with more elements, increasing the process working time to reduce the frequency of personnel contacting harmful materials.

### Feature-Tec Filtration System

**Fully Automatic, Simple Maintenance, High Precision**

Feature-Tec multi-stage filtration systems purify electrolytes by installing filters before and after the heat exchanger. Feature-Tec’s 0.5 μm filter effectively controls the purity of the electrolyte. SelfClear automatic filtration system feature efficient, fully sealed performance as compared to regular manual change-out filter housings.
Filter Applications

Different filters are used at each stage to remove contaminants, ensuring purity of the end product.

<table>
<thead>
<tr>
<th>Filter</th>
<th>Micron Rating</th>
<th>Features</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>SelfClear</td>
<td>1μm</td>
<td>Fully automatic Minimal manual operation High Efficiency</td>
<td>Fully automatic Minimal manual operation High Efficiency</td>
</tr>
<tr>
<td>Oil Absorption Filter Bag</td>
<td>1μm</td>
<td>Absorbs oil High precision</td>
<td>Effectively filters electrolytes Prevents heat exchanger fouling Removes particles &amp; pump oil</td>
</tr>
<tr>
<td>Jumbo Filter System</td>
<td>0.5~1μm</td>
<td>Large filtration area Long service life High precision</td>
<td>Improves electrolyte purity Removes pipeline particles Assures copper quality</td>
</tr>
</tbody>
</table>

Feature-Tec provides filtration solutions according to our clients’ work process and required filtration precision. The micron rating of filters can be adjusted, while oil absorption pillows can be added for increased oil absorption from the process.

Surface Treatment

Bath liquids used for treating copper foils should be filtered to remove contaminants, ensuring high product quality.

As treatment of copper foils requires many complex steps involving circulating washing liquids, the Jumbo filter system extends the service life of the fluids by filtering the fluids before reuse.
SelfClear automatic backwashing filtration system is designed for continuous production processes. The system effectively removes particles from liquid or gas streams and discharges dry cake from the system.

The fully sealed SelfClear system is suitable for use as the primary filter for copper foil electrolyte processes, featuring higher efficiency than regular filters. The system can be used along with activated carbon filters and diatomite for effective control of output particle size.

**Filtration Principle**

Process fluid enters the filter housing and enters the cartridge in an outside-to-inside flow pattern. Particles larger than the cartridges' pore size is trapped on the cartridge surface and accumulate to form the filter cake. The filter cake acts as a secondary filter surface, removing smaller particles. When the pressure drop across the cartridge reaches a set value, the inlet and outlet valves are closed as pressurized gas enters the system to dry and discharge the filter cake, regenerating the filter elements.

**Filter Aid**

<table>
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<th>Filter Aid</th>
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<tr>
<td>Diatomite</td>
<td>Aids in filter cake formation</td>
</tr>
<tr>
<td>Activated Carbon</td>
<td>Adsorbs organic substances</td>
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</tbody>
</table>

**Bridging Phenomenon**

As solid particles accumulate on the surface of a filter cartridge, a bridging phenomenon can be observed. The filter cake forms a secondary filter medium capable of trapping particles smaller than the micron rating of the filter element. This phenomenon is particularly effective for processes with high dirt content.

**Filter Element**

Feature-Tec uses a patented 6 + 1 cartridge arrangement design to provide effective filtration and backwashing. Patents:

200620046959.X Polygonal cartridge tube arrangement  
200820057362.4 Catalyst recovery filter  
200720046612.X Filter cloth accumulator system
Description

Jumbo cartridge is a large single opening pleated filter cartridge

- Inside-to-outside flow pattern
Trapped particles are contained within the cartridge, preventing contamination during element change-out.
- Large diameter pleated design
Jumbo cartridges have a large 6" diameter with a pleated media design for a large filtration area. The large filtration area provides higher dirt holding capacity and longer service life.

Operating Conditions

- Max. Operating Pressure Drop: 3.5 kg/cm²
- Max. Operating Temperature:
  GT Series: 80°C
  HT Series: 120°C
- Recommended Flow Rate: 50m³/hr/40°

Technical Specifications

- GT Series
  Micron Rating: 1, 5, 10, 20, 40, 70, 100 µm
  Cartridge Material: Polypropylene
  Core Material: Glass Filled Polypropylene
- HT Series
  Micron Rating: 1, 5, 10, 25 µm
  Cartridge Material: Fiberglass
  Core Material: Polybutylene Terephthalate (PBT)
- Length: 20", 40", 60", 80"
- Outer Diameter: 6"
Rocket Filter Bag

Rocket filter bag is a new innovative product from Feature-Tec as a great alternative for the conventional filter bag. Using a unique pleated design, it provides over four times the filtration area than the regular bag, increasing its service lifespan and reducing element change-out downtime. The polypropylene or polyester bag is applicable for a wide range of industrial applications, and is compatible with equipment currently using conventional bags, eliminating the need of investing in new equipments.

1. Various seal types to choose from to ensure good sealing.
2. Folding design which provides a longer service and four times the filtration area, which expands when pressurized.

Feature-Tec’s Rocket Absolute Filter Bags’ four layered design can provide up to 99.9% filtration efficiency, and is applicable for catalyst recovery systems and the electronics industry.

Features:
- Folded structure
- PP / PE material
- Conical cap seal

Advantages:
- Able to provide a larger flow rate compared to similar sized bags
- Larger filtration area providing higher filtration efficiency
- Excellent chemical properties
- Good sealing performance
- Compatible with equipments using conventional filter bags

Benefits:
- Low equipment investment cost
- Longer service life reduces replacement downtime
- Better temperature and acidic tolerance for wider applications
- Reduces risk of side leakages
Feature-Tec’s 0.5 μm filter effectively purifies electrolytes by installing filters before and after the heat exchanger. Multi-stage filtration systems in housings with more elements increase the process working time, reducing the frequency of personnel contact with harmful materials. These filters require a complex process that exposes workers to harmful particles. Using larger copper foils instead can mitigate this issue. Copper is widely used in lithium-ion batteries and printed circuit boards for its conductive properties. As copper develops, Feature-Tec offers solutions to reduce operational costs. Electrolyte purification is increasingly important to improve battery quality. Thinner, high-ductility foils are used in the electronics industry today. Feature-Tec has various solutions for this requirement. Copper is a versatile material used in industrial applications and is compatible with equipment using conventional bags. Feature-Tec uses a patented 6 + 1 cartridge arrangement design to achieve high efficiency. The filter cake forms a secondary filter surface, removing smaller particles. When the pressure drop across the cartridge reaches a set value, the inlet controls the output particle size. A SelfClear design removes the filter cake, regenerating the system to dry and discharge the filter cake. Patents provide effective filtration and cartridge sealing. Feature-Tec offers a range of filter applications, including high-precision filtration systems.