Inks, Paints, and Specialty Coatings
Training guide for filtration products and applications
For technical or application support related to our fluid filtration solutions, please call our toll free number 877 784 2234 or email dhpsales.na@parker.com
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Introduction
Providing a cost-effective filtration technology that ensures consistent quality and process optimization

Parker domnick hunter’s proven product range and applications experience in the inks, paints, and specialty coatings industry enables us to ensure that every step of the manufacturing process meets the customers’ quality specifications. The manufacture and application of an ink or coating can be divided into the following processes:

- Resin processing and introduction of resins to blending and dispersion phases.
- Production of deionized water for use in aqueous based product.
- Additives and raw materials for the dispersion phase.
- Product manufacturing processes where the pigments are milled and blended with either solvent or water and packaged.
- Packaging and transportation of the liquid products to the application, whether it is printed, painted, or coated.

Given the variations of these processes for inks, paints, or specialty coatings, it is critical to consider the operating parameters when selecting filtration for each stage of manufacturing.

As formulations become more complex, the manufacturing process demands also become increasingly more critical. With increasing energy and disposal costs, it is important that the recommended filtration systems provide minimal process downtime and low product waste, so the total cost of ownership of the filtration system is balanced, without compromising the quality of the end product.

MARKET APPLICATIONS
Additives & Raw Materials
- Diluents
- Filters
- Primers
- Stabilizers
- Surfactants
- Resins
- Polymers
- Water
- Pigment
- Oils
- Plasticizers
- Emulsions
- Solvents

Commercial & Industrial Coatings
- Adhesives
- Aerosols
- Architectural paint
- Caulks
- Corrosion inhibitors
- Dyes
- Finishes
- Marine coatings
- Packaging coatings
- Primers
- Sealants
- Shellac
- Varnishes
- Lacquer
- Wood finishes

Printing Inks
- Can coatings
- Conductive
- Film coatings
- Flexographic
- Gravure
- Heat set inks
- Ink jet printing
- Lithographic
- Non-impact
- Screen printing
- UV sensitive

Specialty & Performance Coatings
- Automotive
- Clear coats
- Flooring systems
- Fluorescent coatings
- Glaze
- High performance coatings
- Optical coatings
- Protective coatings
- Road paints
- Stains
- Textured finishes
- Transparent armors
- Water proofing
Additives & raw materials
As paint, ink and resin formulations become ever more complex and expensive, filtration to remove impurities from raw materials becomes increasingly important to ensure the quality of the final product as well as controlling manufacturing costs.

Deionized water process
The use of Polypropylene depth or high-flow pleated filters on the deionization system is used to treat incoming mains water. Trap filters ensure that the make-up process water is of high-purity by preventing downstream contamination of source water sediment or ion exchange bead migration.

Resin process
Resins such as acrylics, alkyls, epoxies and polyesters are key constituents to paints and inks, and with the development of more and more sophisticated coatings, resin quality specifications are becoming more stringent. The variable process conditions in resin manufacturing processes can result in high volume of polymorphous contamination which affects the final finish of the end product by causing what is commonly known as 'fish eyes', cratering or dull finishes. Use of the correct filtration reduces manufacturing costs by preventing rework, recategorization, and waste.

Manufacturing process (blending / thinning)
Milling and blending are critical steps and effectively define the type of ink, paint, or specialty coating that is being manufactured. Any oversized pigments that are present after the milling are removed by the use of ‘classification’ filters. This ensures the correct pigment size distribution, optimizing the pigment dispersion rate during the blending stage and producing a final product within the required specification.

Use of the correct upstream clarifying filter removes gels, fibers, agglomerates and airborne contaminants without stripping out the required components of the end product.

Application process
Following filling and packaging, it is vital to ensure that the product remains contaminant free and within specification during shipment. A point of use (POU) filtration system at the end-user site reduces the risk of any contamination that may have entrained in the product during delivery, storage and distribution.

STAGES 1 - 14
(See pages 5-11 for detailed product references)
### Application

<table>
<thead>
<tr>
<th>Stage 1</th>
<th>Course clarification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of organic particulates of variable size distribution, agglomerates generated from post resin reactor and carry-over from shipping of resin to manufacturing plant.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 2</th>
<th>Fine clarification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of tank precipitates, process, gel removal and post-reactive fine particulates. These impurities can contaminate the final blending stage and lead to surface defects visible on the coated substrate.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 3</th>
<th>Fine clarification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of haze formed as a result of fine particle impurities (5 - 50 micron) that are precipitated due to temperature fluctuations.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 4</th>
<th>Pre-filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove fines from water main distribution lines to increase deionization resin life and efficiency.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 5</th>
<th>Course trap filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of ion exchange resins from the deionization resin beds or columns that will have washed out.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 6</th>
<th>Fine trap filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>DI water is filtered to remove tank precipitates, fine resins and process contaminants to ensure clean DI water to dispersion tank.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 7, 8 &amp; 9</th>
<th>Fine clarification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of impurities from raw materials used for coatings make-up further downstream. Filtering the raw materials as a precaution ensures monomers, additives and solvents are contaminant free reducing risk of batch rework.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 10</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of oversized pigments, gels, agglomerates (fibers, environmental debris, organic polymers) - this is a critical step because the correct pigments size distribution will ensure efficient pigment dispersion rates during the blending stage and prevent rework of the batch.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 11</th>
<th>Clarification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of fine haze, unreacted resins, contamination entrained through resin transfer and storage tank. Resin will vary in grade and viscosities for inks, automotive paints and general low end coatings like paints, varnish and stains.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 12</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post blending (thinning) product recirculation. Removal of oversize pigments, gels, agglomerates to ensure that product reaches specification before being packed and shipped.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 13</th>
<th>Clarification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of contamination entrained due to transport and storage, e.g. agglomerates, polymerized gels and tank precipitates. Filter protecting dispensing mechanisms, e.g. nozzles, rollers, spray heads from fibers, process contamination and dried pigment particles, semi-deformable gels. Presence of these in the final coating will lead to poor quality coatings finish and high maintenance.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage 14</th>
<th>Point-of-use filter</th>
</tr>
</thead>
</table>

### Primary Filter

<table>
<thead>
<tr>
<th>Core products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulfil® ProBond®</td>
</tr>
<tr>
<td>Fulfil® EcoBond™</td>
</tr>
<tr>
<td>Fulfil® Poly-Mate™ and Poly-Mate® Plus</td>
</tr>
<tr>
<td>Fulfil® Honeycomb</td>
</tr>
<tr>
<td>Fulfil® Poly-Mate®</td>
</tr>
<tr>
<td>Fulfil® DuraBond®</td>
</tr>
<tr>
<td>Fulfil® ProBond®</td>
</tr>
<tr>
<td>Fulfil® Claripor™</td>
</tr>
<tr>
<td>Fulfil® ParMax &amp; ParMax Select</td>
</tr>
<tr>
<td>Fulfil® Poly-Mate™ Plus</td>
</tr>
<tr>
<td>Fulfil® DuraBond® Plus</td>
</tr>
<tr>
<td>Fulfil® ProBond®</td>
</tr>
<tr>
<td>Fulfil® EcoBond™</td>
</tr>
<tr>
<td>Fulfil® Poly-Mate® Plus</td>
</tr>
</tbody>
</table>

### Alternate Filter

<table>
<thead>
<tr>
<th>These products are application dependent based on the filtration fluid properties and purity level requirements within the system.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulfil® Basket Strainers</td>
</tr>
<tr>
<td>High temperature</td>
</tr>
<tr>
<td>Fulfil® MegaBond Plus</td>
</tr>
<tr>
<td>High end resin</td>
</tr>
<tr>
<td>Fulfil® Metallic</td>
</tr>
<tr>
<td>&gt;200F (93C)</td>
</tr>
<tr>
<td>Glass-Mate® 125F (52C)</td>
</tr>
<tr>
<td>Fulfil® Metallic</td>
</tr>
<tr>
<td>&gt;200F (93C)</td>
</tr>
<tr>
<td>Fulfil® ParMax &amp; ParMax Select</td>
</tr>
<tr>
<td>High flow over 300gpm</td>
</tr>
<tr>
<td>Evadur™</td>
</tr>
<tr>
<td>High end aqueous based inks</td>
</tr>
<tr>
<td>Fulfil® MegaBond Plus™</td>
</tr>
<tr>
<td>High flow over 300gpm</td>
</tr>
<tr>
<td>Polyflow®-G Mini-capsule</td>
</tr>
<tr>
<td>Small batch operations</td>
</tr>
<tr>
<td>Glass-Mate® 125F (52C)</td>
</tr>
<tr>
<td>Fulfil® Metallic</td>
</tr>
<tr>
<td>&gt;200F (93C)</td>
</tr>
<tr>
<td>Fulfil® Claripor™</td>
</tr>
<tr>
<td>Gel removal</td>
</tr>
<tr>
<td>High end inks</td>
</tr>
<tr>
<td>Cystal-Bond®</td>
</tr>
<tr>
<td>Gel removal</td>
</tr>
<tr>
<td>High end inks</td>
</tr>
<tr>
<td>Glass-Mate® 125F (52C)</td>
</tr>
<tr>
<td>Fulfil® Metallic</td>
</tr>
<tr>
<td>&gt;200F (93C)</td>
</tr>
<tr>
<td>Glass-Mate® 125F (52C)</td>
</tr>
<tr>
<td>Fulfil® Metallic</td>
</tr>
<tr>
<td>&gt;200F (93C)</td>
</tr>
<tr>
<td>Glass-Mate® 125F (52C)</td>
</tr>
<tr>
<td>Fulfil® Metallic</td>
</tr>
<tr>
<td>&gt;200F (93C)</td>
</tr>
</tbody>
</table>
Product selection
Identifying customer needs

In order to meet filtration specifications, physical and chemical conditions of the process have to be considered.

It is therefore essential that a methodical process for identifying the customer’s needs is followed.

The SELECT process builds on the principles used to select the optimized filtration solution for the end-user. So, keeping the end goal in mind, these outlined procedures are designed to help identify suitable filtration solutions.

• What is the customer trying to achieve?
  - Resin clarification
  - Deionized water
  - Prefiltration to ion beds and trap filtration
  - Clarification of solvents
  - Clarification of additives
  - Clarification of monomers
  - Pigment classification of coating paste
  - Post thinning tank purification
  - Pre-pack filtration
  - Point-of-use (POU) filtration

• What are the target contaminants?
  - Fibers and gels
  - Oils and grease
  - Haze or bioburden
  - Oversized pigments and resins
  - Minerals and salt components
  - Metallics and mastics
  - Environmental and process contaminants

• Legislation and environmental

• What type of filter?
  - Sieve / strainer
  - Clarification (depth / pleated)
  - Clarification (course)
  - Classification (graded density)
  - POU / LCF (pleated / membrane)
  - Single-pass
  - Multi-pass
  - Media
  - Solids loading

• Life to blockage
  - Identify volume throughput (batch size)
  - Prefiltration
  - Flow rates
  - Viscosities

• Filter integrity
  - Chemical compatibility
  - Operating temperature
  - Pressure / pulsating

• Type of fluid
  - Thixotropic
  - Newtonian

• Flow rate
  - Pump performance

• Existing housings
  - Duplex
  - Enclosed system assemblies

• End cap configuration
  - Retrofit existing housings

• System size
  - Capital cost vs operating cost

• Operational efficiency
  - Low downtime
  - Low hold-up volume
  - Low disposable costs

• Product and process safety
  - Minimize operator exposure to process chemicals (no spillage)

• Differentiation through support programs
  - Contract testing
  - Filter changeout
  - Operator training
  - Process audits
  - Returned filter analysis
  - Pilot tests

• Parker cross-divisional solutions

• Alternative technologies
  - Custom engineered solutions

• Ongoing support benefits
  - Contract testing
  - Troubleshooting
  - Technical audits
  - Operator training
  - Validations
  - Product trials
  - Scale-up

• TSG support
  - Experienced and highly qualified scientists
  - Fully equipped labs

• Regional support

• High degree of divisional support
Resin process
Understanding the basic application

Resins such as acrylics, alkyds, epoxies and polyesters are key constituents of paints and inks and with the development of more sophisticated coatings, resin quality specifications are becoming more stringent.

The variable process conditions during resin manufacturing can result in a variety of contaminants such as:
• Haze
• Salts
• Deformable gels
• Fibers
• Semi-solid particles

These affect the final finish of the coating by causing defects such as "fish-eyes", cratering and lead to poor finishes.

Incorrect filters can lead to:
• Re-working (re-classification) of the resin
• Resin waste
• Excessive filter replacements

Resulting increase in:
• Disposable costs
• Energy costs
• Recirculation of batches

Leading to overall higher manufacturing costs.

The varying size distribution of the contaminants offer a challenge that requires multiple filter types and stages.

<table>
<thead>
<tr>
<th>Core Filter</th>
<th>Stage</th>
<th>Features</th>
<th>Benefits</th>
<th>Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulflo® ProBond™ 50-150 micron</td>
<td>1</td>
<td>A phenolic resin filter</td>
<td>Excellent compatibility with high temperature and aggressive resins</td>
<td>High durability and life</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Graded rigid density matrix</td>
<td>No gel or contaminant off-loading</td>
<td>Low batch rejects and re-work</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Silicone-free media</td>
<td>Prevents formation of cratering or ‘fish-eyes’ on surface finish</td>
<td>No wastage / reject or re-work of coated substrate</td>
</tr>
<tr>
<td>Fulflo® EcoBond™ 1-50 micron</td>
<td>2 &amp; 3</td>
<td>Graded density matrix</td>
<td>Ideal for haze removal or multi-pass</td>
<td>Maintains quality at low cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No surfactants, binders or adhesives</td>
<td>Very low extractables</td>
<td>No recontamination or alteration of end product</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uniform fiber diameter</td>
<td>Consistent filter performance</td>
<td>Assured quality of end product</td>
</tr>
</tbody>
</table>
Deionized water process
Understanding the basic application

Water used in the manufacturing process must be deionized and filtered. Pre-filters to the deionization system are used to treat incoming mains water. The trap filters ensure that the make-up process water is of high-purity by preventing downstream contamination of source water sediment or ion exchange bead migration.

Following the deionization system the water is filtered to remove any fine resins that could potentially wash out from the deionization beds or columns.

The stored deionized water is filtered to remove any tank or process debris before it is introduced into the dispersion or blending tanks.
Additives and raw materials
Understanding the basic application

The dispersion rate of the pigments is a critical step for establishing the final product specification and properties. The additives and raw materials enable the dispersion to be optimized and any impurities present will interfere with the dispersion phase.

Filtration of the additives and raw materials at source and prior to the critical dispersion, grinding and mixing steps ensures that the quality at every stage is maintained thus preventing batch rework.

Maintaining control of the manufacturing process is helped by implementing the correct type of filtration in the process. The removal of multiple impurity types from the various feed streams into the dispersion tank is achieved by selecting the appropriate classifying or clarifying filter.

Filtering only at the final stage of manufacturing is unproductive and costly because no one filter can remove all contaminant types.

<table>
<thead>
<tr>
<th>Core Filter</th>
<th>Stage</th>
<th>Features</th>
<th>Benefits</th>
<th>Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulflo® Poly-Mate™ 0.5-3 micron</td>
<td>7, 8 &amp; 9</td>
<td>Controlled pore size distribution</td>
<td>Prevents downstream migration of DI tank and softener particulates</td>
<td>Maintains quality at low cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High filtration surface area</td>
<td>High flow rates and extended life</td>
<td>Low maintenance and operating costs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-fiber shedding media</td>
<td>Maintains filter efficiency and integrity</td>
<td>Assured consistency and product quality</td>
</tr>
</tbody>
</table>
Manufacturing process
Understanding the basic application

Following the dispersion of the ‘premix’ the pigments that characterize the end product are added to form a viscose paste called the ‘dispersion’ or ‘mill base’. The mill base is loaded with pigments of varying size distribution that are not consistently mixed and are agglomerated.

The mill base is then ground or milled to achieve pigments of the required size so that they disperse uniformly and provide the character for intended function. Any oversize pigments are removed from the batch by classification filters and reworked into subsequent batches.

Final product specifications are achieved in the blending (thinning) stage. The blending stage involves reducing or thinning to ensure that the tint, durability and properties are exact to specification prior to packing and shipping.

This is often the most critical stage and consequently may require recirculation of the batch through filters to control the pigment size distribution and removal of by-products such as fibers, gels and agglomerates.

<table>
<thead>
<tr>
<th>Core Filter</th>
<th>Stage</th>
<th>Features</th>
<th>Benefits</th>
<th>Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulflo® DuraBond™ 1-25 micron</td>
<td>10, 11 &amp; 12</td>
<td>No requirement of core / cage</td>
<td>Easy to dispose</td>
<td>Environmentally friendly and reduces disposal costs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fibers made of Bi-componant polymer</td>
<td>Enables a strong rigid density matrix that does not shed fibers</td>
<td>Selective retention of deformable particles over a longer differential pressure drop rise and so provides good filter life</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Silicone-free materials of construction</td>
<td>Will not cause ‘fish-eyes’ or cratering on painted surface</td>
<td>Reduces product waste and improves yield</td>
</tr>
<tr>
<td>Fulflo® ProBond™ 2-75 micron</td>
<td>10 &amp; 12</td>
<td>No requirement of core / cage</td>
<td>Easy to dispose</td>
<td>Environmentally friendly and reduces disposable costs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Made of Phenolic resin</td>
<td>Provides rigid matrix and compatibility at high temperature and solvents</td>
<td>Retention of deformable particles over a longer differential pressure drop rise and so provides good filter life at cost-effective process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Silicone-free materials of construction</td>
<td>Will not cause ‘fish-eyes’ or cratering on painted surface</td>
<td>Reduces product wastage and improves yield</td>
</tr>
</tbody>
</table>
The final step in the manufacturing process is the product filling. The end product, whether an ink, paint or specialty coating, is required to be filled and packed free from any process contaminant.

As a preventative measure and good manufacturing practice (GMP) most high end manufacturers such as automotive, paper coaters, can, coil coaters and printers will ensure that the end product is filtered from environmental or process contaminants that may have entered or developed during shipping or while in storage.

All inks, paints and specialty coatings are usually dispensed through a controlled and automated dispensing system.

To ensure smooth running and low down time on maintenance of the dispenser, a point-of-use (POU) security filter is used. These filters are also appropriately known as last chance filters (LCF).

The function of the POU / LCF is to protect nozzles, seals and pumps on the original equipment manufacturer (OEM) dispensing system.

### Core Filter Stage Features Benefits Advantages

<table>
<thead>
<tr>
<th>Core Filter</th>
<th>Stage</th>
<th>Features</th>
<th>Benefits</th>
<th>Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulflo® EcoBond™</td>
<td>13</td>
<td>Graded density matrix</td>
<td>Excellent pore size distribution</td>
<td>High dirt holding capacity and life</td>
</tr>
<tr>
<td>1-25 micron</td>
<td></td>
<td>No surfactants, binders or adhesives</td>
<td>Very low extractables</td>
<td>No recontamination or alteration of end product</td>
</tr>
<tr>
<td>High end paints &amp; coatings</td>
<td></td>
<td>Uniform fiber diameter thermally bonded</td>
<td>No media migration</td>
<td>Consistent filter performance and filter integrity</td>
</tr>
<tr>
<td>Fulflo® ProBond™</td>
<td>13</td>
<td>No requirement of core /cage</td>
<td>Easy to dispose</td>
<td>Environmentally friendly and reduces disposable costs</td>
</tr>
<tr>
<td>25-75 micron</td>
<td></td>
<td>Made of Phenolic resin</td>
<td>Provides rigid matrix and compatibility at high temperature and solvents</td>
<td>Retention of deformable particles over longer differential pressure drop rise providing good filter life at cost-effective process</td>
</tr>
<tr>
<td>Low end inks, paints, &amp; specialty coatings</td>
<td></td>
<td>Silicone-free materials of construction</td>
<td>Will not cause ‘fish-eyes’ or cratering on painted surface</td>
<td>Reduces product waste and improves yield</td>
</tr>
<tr>
<td>Fulflo® MegaBond™ Plus</td>
<td>14</td>
<td>True graded density matrix</td>
<td>Absolute rated filter Beta 5000 (99.99%)</td>
<td>High dirt retention on single-pass ensures total protection</td>
</tr>
<tr>
<td>5-30 micron</td>
<td></td>
<td>Thermally welded end caps</td>
<td>No by-pass of coating</td>
<td>Assured filter performance, integrity and product quality</td>
</tr>
<tr>
<td>Low end inks, paints, &amp; specialty coatings</td>
<td></td>
<td>Silicone-free</td>
<td>Will not cause ‘fish-eyes’ or cratering on painted surface</td>
<td>Reduces product wastage and improves yield</td>
</tr>
<tr>
<td>Fulflo® Poly-Mate™ Plus</td>
<td>14</td>
<td>Controlled pore size distribution</td>
<td>Consistent particle capture</td>
<td>Maintains coating application quality at low cost</td>
</tr>
<tr>
<td>0.25-30 micron</td>
<td></td>
<td>High filtration surface area</td>
<td>High flow rates and extended life</td>
<td>Low maintenance and operating costs</td>
</tr>
<tr>
<td>High end inks, paints, &amp; specialty coatings</td>
<td></td>
<td>Non-fiber shedding media</td>
<td>Maintains filter efficiency and integrity</td>
<td>Assured consistency and product quality</td>
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Application process

General overview for inks, paints & specialty coatings
In these industries, manufacturers and end-users face stringent environmental and operational compliances, where the trend is to ensure low VOC exposure and spillage of hazardous waste and provide a more user-friendly process environment. Combined with the market demands for high-quality products, this means that the raw materials and chemistries used in formulations result in higher manufacturing costs.

Results can be utilized to manipulate pre and final filter trains to achieve the desired throughput and quality, without over processing.

An overview of the services provided include:

- Laser particle size analysis
- Particulate analysis
- Chemical and analytical techniques
- Filterability index analysis
- Existing system optimization
- Fault diagnosis

Parker domnick hunter is committed to providing comprehensive technical support of our products through our global sales network and dedicated technical support group. Our team of trained scientists, engineers and technicians is available to answer questions on the capabilities of our products, assist customers to select, specify and design filtration systems to meet specific user requirements, and provide a range of advisory and troubleshooting services.

Quantitative particle counting can give an indication of the expected workload of a filter system. This can identify the need for prefiltration or the use of an alternative technology.

Identification of the particulate loading within a process fluid or the analysis of filtrate through various filtration grades and materials can identify the optimum filtration system. Specific particulates can also be identified through light microscopy and SEM to establish the contaminant source.

Chemical testing can be conducted to characterize retained materials on a filter media, aiding in identification of the source of a blockage material. Various analytical techniques, including FTIR (Fourier Transfer Infra Red) spectroscopy, Mass Spectrometry, HPLC and GC can be used to aid in filtration-related diagnosis.

Small-scale trials can be conducted with sample volumes of product under controlled laboratory or process conditions. This method is used to determine the optimum multi-stage filter system or determine the filter size required for a process batch or a continuous process. This allows the system to be specifically sized and designed to give optimum economies in both hardware installation and replacement element cost.

Where a process is altered through increased operational demand, for example through extension of a production campaign, higher production volumes or an increased number of product changes, Parker domnick hunter offers support to ensure the system remains appropriate for these changed process demands.

Often filtration is a critical step or control point within a process, therefore, when finished product quality is not achieved the filter is often the first point of call. The Parker domnick hunter TSG group can provide a reactive service to enable rapid ‘root cause’ analysis and assist in minimizing the risk of recurrence.
**Depth Media Filters**

**Avasan™**
- Pure polypropylene construction
- Finish-free construction provides optimum fluid purity and eliminates foaming
- Continuous bonding of fibers throughout the filter matrix ensures non-fiber releasing construction
- Graded density construction provides built-in prefiltration and longer life

A proprietary melt-blown manufacturing process uses a specially formulated polypropylene polymer to produce a uniquely graded density filter cartridge designed specifically for process water filtration. Rated particle capture from 1 to 75 µm.

**Fulflo® DuraBond™**
- Fixed pore structure provides efficiency, integrity and optimum particle retention
- Thermally bonded fiber matrix provides rigid dimensionally stable construction without fiber migration
- Rigid construction eliminated contaminant unloading and channeling
- Corrugated porous surface maximizes dirt holding capacity
- Most economical high strength filter cartridges available. Featuring an integral rigid thermally bonded construction, the DuraBond™ provides consistent filtration for a wide variety of fluids.

**Fulflo® EcoBond™**
- Thermally bonded melt blown fiber matrix provides dimensionally stable construction
- Continuous fiber matrix prevents media migration and ensures consistent quality filtration performance
- Finish-free construction provides optimum fluid purity and eliminates foaming condition
- Superior inter-layer binding eliminates contaminant unloading and channeling
- Feature a graded density matrix of uniform polypropylene fibers for consistent filtration performance
- Thermally bonded fiber matrix provides rigid dimensionally stable construction
- Continuous bonding of fibers throughout the filter matrix ensures non-fiber releasing construction
- Finish-free construction provides optimum fluid purity and eliminates foaming
- Rigid construction eliminated contaminant unloading and channeling

**Fulflo® MegaBond™ Plus**
- True graded density filter matrix enables controlled pore size and distribution
- Continuous fiber matrix eliminates media migration and high filter efficiency
- Free from surfactants and binders - can not contaminate filtered product
- Pure grade material of construction used ensuring filter integrity and performance

**Fulflo® Honeycomb**
- Broad range of media provide excellent compatibility with water, a variety of oils and organic solvents
- Continuous strand winding geometry provides performance consistency
- Various O-ring and end cap options available
- Multiple length cartridges minimizes change-out time, eliminate spacers, and are available to fit competitive filter vessels

**Fulflo® ProBond™**
- Outer, spiral wrap collects large particles
- Broad range of media provide excellent compatibility with water, a variety of oils and organic solvents
- Continuous strand winding geometry provides performance consistency
- Various O-ring and end cap options available
- Multiple length cartridges minimizes change-out time, eliminate spacers, and are available to fit competitive filter vessels

**Pleated & Large Diameter Pleated Filters**

**Abso-Mate®**
- Non-fiber releasing and contain minimal extractables
- Single-piece construction eliminates bypass concerns
- All-polypropylene construction offers wide chemical compatibility with most chemicals
- Absolute rated for consistent and reliable performance (99.98%, φ=5000)

Cost-effective and absolute rated for capturing particles 0.2 to 70 µm in size. This pleated cartridge is all-polypropylene construction, and without adhesives that could potentially contaminate fluids.

**Claripor™**
- Graded density layering for superior removal of amorphous particles
- Absolute retention ratings for critical filtration
- Pleated construction yields high flow rates compared to traditional depth filters
- All Polypropylene construction

The best of pleated and depth technologies combine in the Claripor to provide high flow rates, excellent gel removal, and absolute particle retention from 0.5 to 90 µm.

**Glass-Mate™**
- Absolute-rated media provides reliable removal efficiency
- Thermally bonded end caps eliminates particle bypass
- Laminated media maximizes flow capacity and minimizes media migration
- Non-fiber releasing media with minimal extractables provide high purity filtration

Offer better temperature resistance than standard polypropylene cartridges and absolute rated efficiency for 0.65 through 40 µm.

**Fulflo® Poly-Mate™**
- All Polypropylene construction maximizes chemical resistance
- High-pleated surface area for extended service life, low pressure drop and high flow capacity
- One-piece, continuous to 40 inches length, integrally sealed pleated filter media
- Finish free and non-fiber releasing polypropylene construction

A unique combination of polypropylene melt blown and spun-bonded media provides high surface area at retention ratings of 0.5 to 60 µm at 99% efficiency.

**Fulflo® Poly-Mate™ Plus**
- Fixed pore construction provides ultimate particle retention
- Pleat pack optimization offers high flow rates and extended service life
- Non-fiber releasing enabling consistent quality filtration performance
- One piece integral construction is 100% bonded for maximum cartridge integrity
- High surface area and efficiency ‘all-polypropylene’ pleated cartridges.

**Fulflo® ParMax™ and ParMax Select**
- Large diameter patented select pleat adds up to 40% extra life
- High flow capacity permits use of fewer elements and cuts capital expenditures
- Inside-out flow pattern ensures positive capture of contaminants
- Absolute retention ratings for critical filtration

Large diameter high flow cartridges.
Fulflo® Metallic

- Available in 304 and 316 Stainless Steel
- Temperature compatibility up to 500°F with synthetic seals; up to 1500°F with NPT connections
- Cartridges may be cleaned and reused
- Welded and crimped construction eliminates need for adhesives which can be a contaminant source and limit temperature range

With fourteen nominal ratings from 2 to 860 µm, the Metallic Filter Cartridges are the ideal choice for high temperature and high flow rate filtration applications.

Fulflo® Bag Filters

- Standard filter bags fit Fulflo® vessels and most major competitive models
- Felt bags come standard with glazed surface treatment to effectively control migration of fibers into the filtered product
- In-to-out flow allows positive retention of bulk contaminant
- Low filter disposable costs

Perform at high flow rates and viscosities to 10,000 cps or higher. Standard bag filters are available in nominal micron ratings from 1 to 880 µm.

Fulflo® Basket Strainers

- Constructed of 316 Stainless Steel
- Available in two standard sizes to fit all Fulflo bag filter vessels
- Cleanable permanent media
- Designed for high flow rates and operating pressures up to 150 psi

Effectively remove large-sized particles ranging from US Mesh 100 to 20 (149 to 840 µm). Fulflo Basket Strainers are useful as prefilters for the collection of gross contaminants in viscous liquids up to 15,000 SSU.

Fulflo® Pleated Bag

- High capacity reduces the number of filters required resulting in less frequent change-out and lower filtration costs
- High capacity allows for smaller housings and less capital expenditure
- Inside/Outside flow captures and retains contaminants to eliminate potential fouling downstream
- Designed to fit existing Parker Fulflo bag housings (CB, FB, and SB models)

Provides a cost-effective alternative, with higher removal efficiencies, over standard bag media configurations. The variety of media materials makes it an optimum choice for inks, paints, and coating applications requiring 1 to 90 µm capture at 99% efficiency.

Fulflo® XLH

- Provide twice the dirt-holding capacity at a lower cost than many competitive bags and cartridges of the same micron rating
- Require less frequent change out, minimal storage and disposal space, and are easy to install and remove
- Each bag is incinerable (with Quik-Seal™ option), reducing filter disposal costs

Ideal for filtration applications requiring removal of solids, the all-polypropylene high-efficiency for quality filtration performance.

Polyflow®-G Mini-Capsule

- All Polypropylene construction
- Pleated encapsulated media with a variety of inlet/outlet connection options
- High flow rate reduces processing time
- Long service life minimizes change out frequency

These encapsulated filters offer absolute retention at 0.6 to 10 µm for critical applications where cross-batch contamination and hold-up volume are a concern.

Evadur™

- High purity polypropylene support structure
- Thermally bonded to exclude liquid capture and extractables
- Strict quality control on measuring rinse-up, integrity testing, flow rate, and extractable levels

This high purity hydrophilic polyethersulfone membrane cartridge is designed specifically for high purity water and chemical filtration applications with retention ratings of 0.03 to 0.65 µm.

Filter Vessels

Fulflo® bag filter vessels

Bag filter vessels designed for economical filtration of coatings applications:
- Single and multi-bag housings
- Available in 304 or 316 SS
- GMP Industrial design with ASME coded options
- Vessels available as standard or custom design

Cartridge filter vessels

Cartridge filter vessels designed for economical filtration of coatings applications:
- Single and multi-cartridge housings
- Available in 304 or 316 SS
- GMP Industrial design with coded options (ASME, PED-CE)
- Vessels available as standard or custom design
Worldwide Filtration Manufacturing Locations

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