Applications

Trapfil™ cartridges are suitable for the guard filtration of a wide range of beverages, to enable the economic removal of diatomite and PVPP particles.

Typical applications include:

- **Stabilisation**
  For the removal of coarse and fine PVPP powder used in the beer and wine stabilisation processes.

- **Clarification**
  For the removal of kieselguhr powder used in the beer and wine clarification processes.

Anatomy of a Trapfil™ Guard Filter

The Trapfil™ filter from Porvair Filtration Group has been specifically developed for the retention of diatomite and polyvinylpolypyrrolidone (PVPP) particles. It is manufactured from materials which are 100% FDA (Food and Drug Administration) approved and fully welded for strength and integrity.

The all polypropylene construction enables the Trapfil™ filter to be resistant to hot caustic solution and standard CIP practices. It is also compatible with steam and hot water sanitising procedures.

Designed to be backflushed in situ to remove diatomite and PVPP particles. The Trapfil™ filter has been industry proven to withstand up to 100 backflush cycles with hot caustic solution at 70-80ºC. This backflushing process will regenerate the Trapfil™ filter providing the end user with improved economics.

The Trapfil™ filter is available in a variety of lengths and industry standard adaptors. Trapfil™ cartridges are available in 5, 10 and 15 micron ratings, validated at Beta 5000.

Each Trapfil™ filter carries a unique serial number to enable full traceability of material components.
Features and Benefits

• Trapfil™ cartridges
Careful media selection means that Trapfil™ cartridges have a long on-stream life resulting in excellent operating economics.

• Backflushing
High strength construction of the Trapfil™ cartridge enables repeated backflushing without loss of integrity.

• Chemical regeneration
Resistant to many standard CIP process chemicals including hot caustic solution and acids.

• Suitable for steam and hot water sanitisation
Trapfil™ cartridges are resistant to repeat steam sterilisation at 125°C (257°F) and hot water cycles at up to 90°C (194°F). Trapfil™ cartridges have been tested in a major European brewery to withstand up to 100 x backwash cycles with 2% w/v sodium hydroxide solution at 55°C (131°F).

• Guaranteed removal ratings
Trapfil™ cartridges are validated using the recognised industry standard modified OSU-F2 single pass test to Beta 5000 (99.98% efficiency).

• Full traceability
All Trapfil™ cartridges are identified with a batch serial number. Each Trapfil™ cartridge is supplied with a Certificate of Quality and an operating instruction leaflet.

• Controlled manufacturing environment
Trapfil™ cartridges are manufactured in an ISO Cleanroom environment by fully gowned staff, minimising the risk of contamination.

Cartridge Construction
Trapfil™ cartridges are manufactured from a multi-layer combination of support layers and filtration media. Trapfil™ cartridges have optimal pleat geometry to maximise the available filtration area and to ensure an efficient flow through the cartridges.

An all thermal fusion bonded assembly process eliminates the use of resins and binders.

Manufactured as standard with injection moulded polypropylene inner and outer supports, Trapfil™ cartridges are designed with the strength necessary to withstand mechanical and thermal stresses encountered during backflushing and steam sterilisation.

All components used in the construction of Trapfil™ cartridges are FDA approved to 21CFR and meet or exceed the latest EC Directives for Food Contact.

Table 1  Particle Retention Rating

<table>
<thead>
<tr>
<th>Code</th>
<th>Pore Rating (microns)</th>
<th>Absolute Rating 99.98% Beta 5000 (microns)</th>
<th>Nominal Rating 99.90% Beta 1000 (microns)</th>
<th>Nominal Rating 90.00% Beta 10 (microns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R05</td>
<td>5</td>
<td>5</td>
<td>2.6</td>
<td>1.25</td>
</tr>
<tr>
<td>R10</td>
<td>10</td>
<td>10</td>
<td>8</td>
<td>7.5</td>
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<tr>
<td>R15</td>
<td>15</td>
<td>15</td>
<td>11</td>
<td>9</td>
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</tbody>
</table>
Specifications

Materials of Manufacture

Filter media: Polypropylene
Support layers: Polypropylene
Inner core: Polypropylene
Outer support: Polypropylene
End fittings: Polypropylene
Support ring: Stainless steel

Cartridge Dimensions (Nominal)

Diameter: 70mm (2.8”)
Length: 1 module: 254mm (10”), 508mm (20”)
2 modules: 762mm (30”), 1016mm (40”)

Effective Filtration Area

<table>
<thead>
<tr>
<th>Absolute Removal Rating</th>
<th>Effective Filtration Area (each 254mm (10”) module)</th>
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<tbody>
<tr>
<td>5, 10 and 15μm</td>
<td>0.53m² (5.7ft²)</td>
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</tbody>
</table>

Cartridge Treatment

Standard: Cleaned and flushed with pyrogen-free water.

Gaskets and O-Rings

FDA approved Ethylene Propylene, FEP encapsulated, Silicone, Viton® or Nitrile.

Maximum Differential Pressure

Normal flow direction at:
20°C (68°F): 6.0bar (87psi)
80°C (176°F): 4.0bar (58psi)
100°C (212°F): 3.0bar (44psi)
Reverse flow direction at:
20°C (68°F): 2.1bar (30psi)
80°C (176°F): 1.0bar (15psi)
100°C (212°F): 0.5bar (7psi)

Operating Temperature

Maximum continuous: 80°C (176°F)

Sterilisation

In situ steam 100 x 30 minute cycles at 125°C (257°F).
Hot water 250 x 20 minute cycles at 85-90°C (185-194°F).

Extractables

Minimum total extractables. Please refer to the Trapfil™ Validation Guide.

Integrity Testing

Trapfil™ filter cartridges are batch tested for integrity using the Bubble Point Test. Procedural details are available from Porvair.

Clean Water Flow Rates

- Typical clean water flow rate:
  A 254mm (10”) Trapfil™ single cartridge exhibits the flow-ΔP characteristics indicated below, for solutions with a viscosity of 1 centipoise.
- Other solutions:
  For solutions with a viscosity of greater than 1 centipoise, multiply the indicated differential pressure by the viscosity in centipoise.

![Flow-ΔP characteristics diagram](image-url)

<table>
<thead>
<tr>
<th>Differential Pressure (mbar)</th>
<th>Flow (l/min)</th>
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<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
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<th>R05</th>
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<tr>
<td>0.05</td>
<td>0.10</td>
<td>0.15</td>
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</table>
Range
Suitable for use in Porvair filter housings and as direct replacements for existing cartridges, Trapfil™ cartridges can be supplied with end fittings to suit most hardware installations without modification. They are available in single or multiple module units of 10, 20, 30 and 40 inches, and in a choice of three removal ratings: 5, 10 and 15 micron. Each cartridge is supplied with all necessary seals or O-rings to ensure chemical compatibility.

Quality Assurance
Trapfil™ cartridges are manufactured in an ISO Cleanroom environment by staff fully gowned to minimise any risk of contamination during production. Trapfil™ cartridges are batch tested and flushed with pyrogen-free ultra-pure water. As a further safeguard, every cartridge is identified with a batch serial number, allowing users to maintain their own process records.

Registered to ISO 9001, Porvair Filtration Group procedures are subject to high standards of quality assurance as demonstrated through its Drug Master File status.

Material Conformity and Validation
The bio-safety of all materials in the manufacture of Trapfil™ cartridges is assured by FDA approval, USP Class VI and meets or exceeds the latest EC Directives for Food Contact.

A comprehensive validation guide for Trapfil™ cartridges is available on request.

Chemical Compatibility
The Trapfil™ materials of construction are compatible with a wide range of chemicals and solvents, however care must be taken to select the appropriate seal material. A comprehensive chemical compatibility guide is available. Since operating conditions vary considerably between applications, verification by the end user is recommended.

Filter Housings
Please contact a Porvair Filtration Group representative for further information on our range of filter housings.