Pharmaceutical filtration

Parker domnick hunter manufacture innovative filtration solutions for critical areas of pharmaceutical production such as bulk chemicals / API, fermentation and sterile final fill. Our validated product range is fully supported by our global network of technical support Scientists and Engineers.

The ability to scale up from small area doots to process-scale systems with minimal revalidation is paramount. Parker domnick hunter provides a wide range of filter formats to ensure that the transition from pilot-scale through to production is as smooth as possible.

Disposable single use systems can eliminate cleaning validation, reduce capital costs, minimize health and safety risks and lower the risk of product contamination, as well as providing a more convenient way of processing a product.

PROCLEAR filters from Parker domnick hunter represent a range of prefiltration and clarification media for particulate removal and bioburden reduction. Designed to maximize throughput in the most demanding applications.

PROPOR multi-format sterile liquid filters from Parker domnick hunter offer a PES membrane which demonstrates low preservative binding and retention of diminutive organisms, coupled with high flow and high capacity performance in critical applications.
PROCLEAR GF Filter Cartridges

PROCLEAR GF filters are designed for reliable and economical removal of particulate and microorganisms from pharmaceutical fluids.

The non-fibre releasing glass microfibre filter media gives excellent dirt holding capacity and high flow rates for long service life and efficient and cost-effective filter system design.

PROCLEAR GF filters have low extractable levels making them ideal for general clarification and prefiltration duties in pharmaceutical processing.

Features and Benefits

- Excellent dirt holding capacity
- Non-fibre releasing glass microfibre media
- Long service life for maximum throughput
- MURUS and DEMICAP’s can be gamma-irradiated and autoclaved

Specifications

Materials of Construction

- Filtration Media: Glass Microfibre
- Upstream Support: Polypropylene
- Downstream Support: Polypropylene
- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Polypropylene
- End Caps Insert: 316L Stainless Steel
- Filter Cartridges: Syringe ø50 mm: 14.50 cm (2.25 in)
- Upstream Support: Polypropylene
- Downstream Support: Polypropylene
- Inner Support Core: Polypropylene
- Capsule Body: Polypropylene
- Capsule Vent Seals: Silicone
- DEMICAP Filter Capsules: Body: Polypropylene
- DEMICAP Disposable Filter Capsules: Core: Polypropylene
- MURUS Disposable Filter Capsules: Core: Polypropylene
- MURUS and DEMICAP’s can be gamma-irradiated and autoclaved

Effective Filtration Area (EFA)

- 10¨ (250 mm): 0.56 m² (6.0 ft²)
- K Size: 0.27 m² (2.9 ft²)
- A Size: 0.20 m² (2.2 ft²)
- B Size: 0.10 m² (1.1 ft²)
- E Size: 0.05 m² (0.6 ft²)

Sterilization

- Gamma-Irradiation: PROCLEAR GF MURUS & DEMICAP disposable filters can be gamma-irradiated up to a maximum dosage of 40 kGy.

Recommended Operating Conditions

Filter Cartridges

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

- Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)
- Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)
- Parker Hannifin certify that this product complies with the European Council’s Pressure Equipment Directive (PED) 2014/68/EU. This product is intended for use with Group 1 & 2 Dangerous and Harmless Liquids and Group 2 Harmless Gases at the operating conditions stated in this document: In compliance with PED Article 3, Paragraph 3, SEP, this product does not bear the CE mark.

MURUS Disposable Filter Capsules

Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)

Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)

Parker Hannifin certify that this product complies with the European Council’s Pressure Equipment Directive (PED) 2014/68/EU. This product is intended for use with Group 1 & 2 Dangerous and Harmless Liquids and Group 2 Harmless Gases at the operating conditions stated in this document: In compliance with PED Article 3, Paragraph 3, SEP, this product does not bear the CE mark.

DEMICAP Filter Capsules

Up to 40 °C (104 °F) at line pressures up to 5.0 barg (72 psig).

Flow (gpm (US))

- For K size for a given flow rate multiply 10¨ size differential pressure by 2
- For A size for a given flow rate divide B size differential pressure by 2
- For E size for a given flow rate multiply B size differential pressure by 2

MURUS and DEMICAP are registered trademarks of Parker Hannifin.
### Performance Characteristics

**TOC / Conductivity**
- The filtrate quality from a 10" (250 mm) PROCLEAR GF conforms to the requirements of current USP <643> (TOC) and USP <645> (conductivity) within the first 200 ml flush of purified water.

**Endotoxins**
- Aqueous extracts from the 10" (250 mm) PROCLEAR GF contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

**Non-Volatile Extractables (NVE)**
- Total NVEs extracted in the first 5 litre flush of purified water for a 10¨ cartridge are <10 mg. Total NVEs extracted in the first 5 litre flush of purified water for an A size 7.9¨ cartridge are <5 mg.

### Oxidizable Substances

** PROCLEAR GF filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.**

### Ordering Information

**Cartridges**

<table>
<thead>
<tr>
<th>Code</th>
<th>Length (Nominal)</th>
<th>Micron</th>
<th>Endcap (10¨)</th>
<th>Variant</th>
<th>Grade</th>
<th>Pack N°</th>
</tr>
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<tbody>
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</tr>
<tr>
<td>K 5¨</td>
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<td></td>
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</tr>
<tr>
<td>1 10¨</td>
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<td>05</td>
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**MURUS Capsules**

<table>
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<th>Grade</th>
<th>Pack N°</th>
</tr>
</thead>
<tbody>
<tr>
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<td>96 µm</td>
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<tr>
<td>B 5.5¨</td>
<td>140 mm</td>
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</tr>
<tr>
<td>A 7.9¨</td>
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**DEMICAP Capsules**

<table>
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<td>50 µm</td>
<td>F Female Luer Lock</td>
<td>G Stepped Hosebarb</td>
<td>T 1¨ Tri-Clamp</td>
<td>N非 -sterilised</td>
<td>y=25 kGy</td>
<td>P PHARMA</td>
<td>F Female Luer Lock</td>
<td>G Stepped Hosebarb</td>
</tr>
<tr>
<td>6 b 5¨</td>
<td>50 µm</td>
<td>F Female Luer Lock</td>
<td>G Stepped Hosebarb</td>
<td>T 1¨ Tri-Clamp</td>
<td>N非 -sterilised</td>
<td>y=25 kGy</td>
<td>P PHARMA</td>
<td>F Female Luer Lock</td>
<td>G Stepped Hosebarb</td>
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<td>6 c 5¨</td>
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<td>T 1¨ Tri-Clamp</td>
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<td>y=25 kGy</td>
<td>P PHARMA</td>
<td>F Female Luer Lock</td>
<td>G Stepped Hosebarb</td>
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<tr>
<td>6 d 5¨</td>
<td>50 µm</td>
<td>F Female Luer Lock</td>
<td>G Stepped Hosebarb</td>
<td>T 1¨ Tri-Clamp</td>
<td>N非 -sterilised</td>
<td>y=25 kGy</td>
<td>P PHARMA</td>
<td>F Female Luer Lock</td>
<td>G Stepped Hosebarb</td>
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**Syringe Filters**

<table>
<thead>
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<th>Outlet Connection</th>
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<th>Grade</th>
<th>Options</th>
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<td>P PHARMA</td>
<td>F Female Luer Lock</td>
<td>G Stepped Hosebarb</td>
</tr>
<tr>
<td>10 B 5¨</td>
<td>0.2 µm</td>
<td>F Female Luer Lock</td>
<td>G Stepped Hosebarb</td>
<td>T 1¨ Tri-Clamp</td>
<td>N非 -sterilised</td>
<td>y=25 kGy</td>
<td>P PHARMA</td>
<td>F Female Luer Lock</td>
<td>G Stepped Hosebarb</td>
</tr>
<tr>
<td>10 C 5¨</td>
<td>0.2 µm</td>
<td>F Female Luer Lock</td>
<td>G Stepped Hosebarb</td>
<td>T 1¨ Tri-Clamp</td>
<td>N非 -sterilised</td>
<td>y=25 kGy</td>
<td>P PHARMA</td>
<td>F Female Luer Lock</td>
<td>G Stepped Hosebarb</td>
</tr>
<tr>
<td>10 D 5¨</td>
<td>0.2 µm</td>
<td>F Female Luer Lock</td>
<td>G Stepped Hosebarb</td>
<td>T 1¨ Tri-Clamp</td>
<td>N非 -sterilised</td>
<td>y=25 kGy</td>
<td>P PHARMA</td>
<td>F Female Luer Lock</td>
<td>G Stepped Hosebarb</td>
</tr>
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</table>

### Pharmaceutical Validation

A full validation guide is available upon request from Laboratory Services Group (LSG).
PROCLEAR GP filters combine glass microfibre and polypropylene media to provide maximum protection to downstream filter membranes and equipment. Dirt holding capacity is maximized through use of a graded density media making PROCLEAR GP cartridge filters an economical and reliable choice for prefiltration. PROCLEAR GP filters have low extractable levels and are suitable for bioburden reduction and fine prefiltration of pharmaceutical fluids and are ideal for high contamination applications.

Features and Benefits
- Dual layer media or increased capacity and assurance
- Ideal for difficult to filter solutions
- MURUS and DEMICAPs can be gamma-irradiated and autoclaved

Performance Characteristics

**Effective Filtration Area (EFA)**
- 10¨ (250 mm) Cartridge: 0.36 m² (3.9 ft²)
- K Size: 0.16 m² (1.7 ft²)
- A Size: 0.12 m² (1.3 ft²)
- B Size: 0.06 m² (0.6 ft²)
- E Size: 0.03 m² (0.3 ft²)
- Syringe ø50 mm: 16.50 cm² (2.25 in²)

**Sterilization**
- PROCLEAR GP filter cartridges can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.
- For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

**Quality Standards**
- Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water.
- Gamma-Irradiation
- PROCLEAR GP MURUS & DEMICAP disposable filters can be gamma-irradiated up to a maximum dosage of 40 kGy.

**Materials of Construction**
- **Filtration Media:** Glass Microfibre / Polypropylene
- **Upstream Support:** Polypropylene
- **Downstream Support:** Polypropylene
- **Inner Support Core:** Polypropylene
- **Outer Protection Cage:** Polypropylene
- **End Caps:** Polypropylene
- **End Caps Insert:** 316L Stainless Steel
- **MURUS Disposable Filter Capsules:**
  - Core: Polypropylene
  - Sleeve: Polypropylene
  - Standard o-rings/gaskets: Silicone
  - Capsule Body: Polypropylene
  - Capsules Vent Seals: Silicone
- **DEMICAP Filter Capsules:**
  - Core: Polypropylene
  - Sleeve: Polypropylene
  - Capsule Body: Polypropylene
  - Capsules Vent Seals: Silicone
- **Syringe Filters:**
  - Body: Polypropylene
  - Capsules Vent Seals: Silicone

**Recommended Operating Conditions**
- **Filter Cartridges**
  - Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP
- **MURUS Disposable Filter Capsules**
  - Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)
  - Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)
- **DEMICAP Capsules**
  - Up to 40 °C (104 °F) at line pressures up to 5.0 barg (72 psig)

**Effective Filtration Area (EFA)**
- 10¨ (250 mm): 0.36 m² (3.7 ft²)
- K Size: 0.16 m² (1.7 ft²)
- A Size: 0.12 m² (1.3 ft²)
- B Size: 0.06 m² (0.6 ft²)
- E Size: 0.03 m² (0.3 ft²)
- Syringe ø50 mm: 16.50 cm² (2.25 in²)

**Effective Filtration Area (EFA)**
- **10¨ size (250 mm) Cartridge**
- **B size (65 mm) Cartridge and Capsule**
### Performance Characteristics

#### TOC / Conductivity

The filtrate quality from a 10" (250 mm) PROCLEAR GP conform to the requirements of current USP <643> (TOC) and USP <645> (conductivity) within the first 200 ml flush of purified water.

#### Endotoxins

Aqueous extracts from the 10" (250 mm) PROCLEAR GP contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

#### Non-Volatile Extractables (NVE)

Total NVEs extracted in the first 5 litre flush of purified water for a 10¨ (250 mm) cartridge are <10 mg. Total NVEs extracted in the first 5 litre flush of purified water for an A size 7.9¨ (200 mm) DEMICAP capsule are <5 mg.

### Ordering Information

#### Cartridges

<table>
<thead>
<tr>
<th>Code</th>
<th>Length (Nominal)</th>
<th>Code</th>
<th>Micron</th>
<th>Code</th>
<th>Outlet</th>
<th>Code</th>
<th>Grade</th>
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<td>L</td>
<td>P</td>
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<tr>
<td>A</td>
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<td>H</td>
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<td>J</td>
<td>Tri-Clamp</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>K</td>
<td>5¨ (125 mm)</td>
<td>N</td>
<td>0.7 µm</td>
<td>K</td>
<td>Tri-Clamp</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
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<td>1</td>
<td>Y</td>
<td>P</td>
<td>P</td>
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<tr>
<td>2</td>
<td>20¨ (500 mm)</td>
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<td>N</td>
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#### MURUS Capsules

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<tr>
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<th>Code</th>
<th>Micron</th>
<th>Code</th>
<th>Inlet</th>
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<tr>
<td>A</td>
<td>1.5¨ (38 mm)</td>
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<td>0.6 µm</td>
<td>A</td>
<td>Male</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>K</td>
<td>2¨ (50 mm)</td>
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<td>K</td>
<td>Male</td>
<td>P</td>
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<tr>
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<td>S</td>
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#### DEMICAP Capsules

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<thead>
<tr>
<th>Code</th>
<th>Length (Nominal)</th>
<th>Code</th>
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<th>Code</th>
<th>Inlet</th>
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<td>P</td>
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<td>A</td>
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<td>Female</td>
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<tr>
<td>K</td>
<td>7.9¨ (200 mm)</td>
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<td>Female</td>
<td>S</td>
<td>S</td>
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<tr>
<td>1</td>
<td>7.9¨ (200 mm)</td>
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<td>0.8 µm</td>
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<td>Y</td>
<td>S</td>
<td>S</td>
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<td>Y</td>
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#### Syringe Filters

<table>
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<th>Code</th>
<th>Diameter</th>
<th>Code</th>
<th>Micron</th>
<th>Code</th>
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<td>4</td>
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<td>S</td>
<td>S</td>
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</table>
PROCLEAR PP filters are designed for a wide range of prefiltration duties within the production of pharmaceuticals and are particularly suited to applications where chemical compatibility is an issue.

The optimum pleat configuration and graded density polypropylene media used in PROCLEAR PP filters ensure the filters have the highest possible throughput to blockage resulting in long service life. The PROCLEAR PP range of filters are fully supported by a comprehensive validation guide to simplify its specification into new and existing processes.

Features and Benefits

- Graded density polypropylene media for high capacity
- Extremely robust to withstand aggressive conditions
- All polypropylene construction
- MURUS and DEMICAP’s can be gamma-irradiated and autoclaved

Effective Filtration Area (EFA)

10" (250 mm) up to 0.79 m² (8.5 ft²)

Sterilization

PROCLEAR PP filter cartridges can be sanitized with hot water at up to 95 °C (194 °F) and are compatible with a wide range of chemicals.

PROCLEAR PP MURUS & DEMICAP disposable filters can be gamma-irradiated up to a maximum dosage of 40 kGy.

Recommended Operating Conditions

Filter Cartridges

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

<table>
<thead>
<tr>
<th>Temperature °C</th>
<th>Max. Entorlent ΔP (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>15</td>
</tr>
<tr>
<td>70</td>
<td>9.0</td>
</tr>
<tr>
<td>80</td>
<td>6.0</td>
</tr>
<tr>
<td>90</td>
<td>4.0</td>
</tr>
</tbody>
</table>

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Perforamce Characteristics

- Flow (L/min) for liquid @ 20 °C and 1 cp
- Flow (gpm (US))

Specifications

Materials of Construction

- Filtration Membrane: Polypropylene
- Upstream Support: Polypropylene
- Downstream Support: Polypropylene

Filter Cartridges:

- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps Insert: 316L Stainless Steel

*Not available in B & L endcap variants

PROCLEAR PP Filter Cartridges can be sanitised with hot water at up to 95 °C (194 °F) and are compatible with a wide range of chemicals.

For K size for a given flow rate multiply 10¨ size differential pressure by 2
For A size for a given flow rate divide B size differential pressure by 2
For E size for a given flow rate multiply B size differential pressure by 2

For operational requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Quality Standards

Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water.

Gamma-Irradiation

PROCLEAR PP MURUS & DEMICAP disposable filters can be gamma-irradiated up to a maximum dosage of 40 kGy.

For operational requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.
Performance Characteristics

TOC / Conductivity
The filtrate quality from a 10¨ (250 mm) PROCLEAR PP conforms to the requirements of current USP <643> (TOC) and USP <645> (conductivity) within the first 200 ml flush of purified water.

Endotoxins
Aqueous extracts from the 10¨ (250 mm) PROCLEAR PP contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

Non-Volatile Extractables (NVE)
Ratings based on efficiencies of > or = 99.98% using internal test procedure SOP018 based on ASTM F795-88 1993

Oxidizable Substances
PROCLEAR PP filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

Ordering Information

### Cartridges

<table>
<thead>
<tr>
<th>Code</th>
<th>Length (Nominal)</th>
<th>Micron</th>
<th>Inlet Connection</th>
<th>Outlet Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCPP</td>
<td>A 5¨ (125 mm)</td>
<td>0.6 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
<tr>
<td></td>
<td>B 6¨ (150 mm)</td>
<td>1.0 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
<tr>
<td></td>
<td>C 10¨ (250 mm)</td>
<td>3.0 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
<tr>
<td></td>
<td>D 30¨ (750 mm)</td>
<td>10.0 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
<tr>
<td></td>
<td>E 40¨ (1000 mm)</td>
<td>15.0 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
<tr>
<td></td>
<td>F 50¨ (1000 mm)</td>
<td>20.0 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
<tr>
<td></td>
<td>G 60¨ (1000 mm)</td>
<td>25.0 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
<tr>
<td></td>
<td>H 75¨ (1000 mm)</td>
<td>40.0 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
<tr>
<td></td>
<td>I 100¨ (1000 mm)</td>
<td>50.0 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
</tbody>
</table>

### MURUS Capsules

<table>
<thead>
<tr>
<th>Code</th>
<th>Length (Nominal)</th>
<th>Micron</th>
<th>Inlet Connection</th>
<th>Outlet Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLPP</td>
<td>A 4.4¨ (113 mm)</td>
<td>0.4 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
<tr>
<td></td>
<td>B 5.5¨ (140 mm)</td>
<td>0.6 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
<tr>
<td></td>
<td>C 7.9¨ (200 mm)</td>
<td>1.0 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
</tbody>
</table>

### DEMICAP Capsules

<table>
<thead>
<tr>
<th>Code</th>
<th>Length (Nominal)</th>
<th>Micron</th>
<th>Inlet Connection</th>
<th>Outlet Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEPP</td>
<td>A 3.5¨ (90 mm)</td>
<td>0.3 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
<tr>
<td></td>
<td>B 4.4¨ (113 mm)</td>
<td>0.4 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
<tr>
<td></td>
<td>C 5.5¨ (140 mm)</td>
<td>0.6 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
<tr>
<td></td>
<td>D 7.9¨ (200 mm)</td>
<td>1.0 µm</td>
<td>/ NPT Female</td>
<td>/ Tri-Clamp</td>
</tr>
</tbody>
</table>

### Syringe Filters

<table>
<thead>
<tr>
<th>Code</th>
<th>Diameter</th>
<th>Micron</th>
<th>Inlet Connection</th>
<th>Outlet Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSPP</td>
<td>30 mm</td>
<td>0.4 µm</td>
<td>/ Luer Lock</td>
<td>/ Luer Lock</td>
</tr>
<tr>
<td></td>
<td>25 mm</td>
<td>0.4 µm</td>
<td>/ Luer Lock</td>
<td>/ Luer Lock</td>
</tr>
<tr>
<td></td>
<td>20 mm</td>
<td>0.4 µm</td>
<td>/ Luer Lock</td>
<td>/ Luer Lock</td>
</tr>
<tr>
<td></td>
<td>16 mm</td>
<td>0.4 µm</td>
<td>/ Luer Lock</td>
<td>/ Luer Lock</td>
</tr>
<tr>
<td></td>
<td>10 mm</td>
<td>0.4 µm</td>
<td>/ Luer Lock</td>
<td>/ Luer Lock</td>
</tr>
<tr>
<td></td>
<td>5 mm</td>
<td>0.4 µm</td>
<td>/ Luer Lock</td>
<td>/ Luer Lock</td>
</tr>
</tbody>
</table>

Note: The information is subject to change without notice. For the latest information, please visit www.parker.com/processfiltration.
PROPOR BR filters have been specifically designed for the fast and cost-effective bioburden reduction of pharmaceutical solutions.

PROPOR BR filters feature an integral meltblown prefilter layer to maximize dirt holding capacity whilst the polyethersulphone membrane guarantees a bioburden log reduction of greater than 5 giving excellent microbial protection. This makes PROPOR BR filters ideal for bioburden reduction of LVPs prior to terminal sterilization.

PROPOR BR filters are also ideally suited to prefiltration and bioburden reduction prior to sterilizing grade membrane filters. The robust construction of PROPOR BR filters guarantees consistent performance on multiple batches.

Features and Benefits

- Brevundimonas diminuta retention of LRV-5 for efficient bioburden reduction
- Additional prefilter layer gives excellent throughputs to blockage
- Low binding for minimal product loss
- MURUS and DEMICAP’s can be gamma-irradiated and autoclaved

Performance Characteristics

- Flow (gpm): 0.25 to 5.0
- Flow (L/min): 1.0 to 220
- Pressure: Up to 30 psi (207 bar)

Specifications

Materials of Construction

- Filtration Membrane: Polyethersulphone
- Prefilter Layer: Polyester
- Upstream Support: Polyester
- Downstream Support: Polyester

Filter Cartridges

- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Nylon
- End Caps Insert: 316L Stainless Steel

MURUS Disposable Filter Capsules

- Core: Polypropylene
- Sleeve: Polypropylene
- End Caps Insert: 316L Stainless Steel
- Capsule Body: Polypropylene
- Capsule Vent Seals: Silicone

DEMICAP Filter Capsules

- Body: Polypropylene
- End Caps: Nylon
- Capsule Body: Nylon
- Capsule Vent Seals: Silicone
- Filling Belt: Polycarbonate

Up to 40 °C (104 °F) at line pressures up to 5.0 barg (72.5 psig).

Recommended Operating Conditions

Filter Cartridges

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CSP to the following limits:

- Temperature: 30°C (86°F)
- Flow: 75 L/min
- Differential Pressure: 4 Bar

MURUS Disposable Filter Capsules

Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)
Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)

Parker Hannifin certify that this product complies with the European Council Pressure Equipment Directive (PED) 97/23/EC, Art 3, Paragraph 3 - Sound Engineering Practice (SEP). This product is intended for use with Group 1 & 2, Classless, Non-Hazardous Liquids and Group 2 Harmless Gases at the operating conditions stated in the document. In compliance with PED Article 4, Paragraph 1, this product does not bear the CE mark.

Quality Standards

Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water and integrity tested prior to despatch. A sample of each lot is tested to demonstrate conformity to validated claims.

Gamma-Irradiation

PROPOR BR MURUS & DEMICAP disposable filters can be gamma-irradiated up to a maximum dosage of 60 kgy.

Materials conform to the relevant requirements of 21 CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Food and Biological Safety

Materials conform to the relevant requirements of 21 CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.
Performance Characteristics

TOC / Conductivity
The filtrate quality from a 10" (250 mm) PROPOR BR conforms to the requirements of current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

Endotoxins
Aqueous extracts from the 10" (250 mm) PROPOR BR contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

Non-Volatile Extractables (NVE)
Total NVEs extracted in the first 5 litre flush of purified water for a 10" (250 mm) cartridge are <10 mg. Total NVEs extracted in the first 5 litre flush of purified water for an A size 7.9" (200 mm) DEMICAP capsule are <5 mg.

Pharmaceutical Validation
A full validation guide is available upon request from Laboratory Services Group (LSG).

Oxidizable Substances
PROPOR BR filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

Retention Characteristics
PROPOR BR filter cartridges are validated to an LRV > 5 by bacterial challenge testing with Brevundimonas diminuta to current ASTM F838-05 methodology (10^6 organisms / cm^2 EFA minimum) with typical in-house challenge levels being 10^7 organisms per 10" (250 mm) module.

Integrity Test Data
All filters are integrity testable to the following limits when wet with water and using air as the test gas.

- Max. Differential Pressure (mbar) @ 10 L / min
- Max. Differential Pressure (mbar) @ 100 L / min

Membrane Material
- PROPOR BR: Nylon, PVDF, Polysulphone, PVDF

Protein Adsorption (mg / cm^2)
- B: (>25 kGy)
- E: EPDM Silicone
- V: Viton

Flow rate comparison for bioburden reduction filters

Protein binding on membrane materials

Ordering Information

Cartridges
- ZCBR
- ZLBR
- DEMICAP

MURUS Capsules
- ZLBR

DEMICAP Capsules
- ZEBR

Syringe Filters
- ZSBR

Note: Intake and discharge connections are standard ¼" male NPT unless otherwise indicated. Malformations are standard ¼" male NPT unless otherwise indicated. All products are sold subject to the company’s Standard conditions of sale.
PROPOR SG Filter Cartridges

- Liquid filters
- Polyethersulphone

Features and Benefits
- Up to 3.5 times higher flow rates than competitive sterilizing grade filters
- Fully validated and integrity testable membrane for assurance of sterility
- Low binding for minimal product loss
- MURUS and DEMICAP’s can be gamma-irradiated and autoclaved

Performance Characteristics

<table>
<thead>
<tr>
<th>Differential Pressure (psi)</th>
<th>Flow (gpm) (US)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>2</td>
<td>6.0</td>
</tr>
<tr>
<td>3</td>
<td>12.0</td>
</tr>
<tr>
<td>4</td>
<td>20.0</td>
</tr>
<tr>
<td>5</td>
<td>27.0</td>
</tr>
</tbody>
</table>

Specifications

Materials of Construction
- Filtration Membrane: Polyethersulphone
- Upstream Support: Polyester
- Downstream Support: Polyester
- End Caps: 316L Stainless Steel
- End Caps Insert: 316L Stainless Steel
- Core: Polypropylene
- Sleeves: Polypropylene
- Capsule: Nylon
- Capsule Body: Polypropylene
- Capsules Vent Seals: Silicone
- Capsule Body: Nylon
- Capsules Vent Seals: Silicone
- Filling Bell: Polycarbonate
- Syringe Filters: Body: Polypropylene

Effective Filtration Area (EFA)
- 10¨ (250 mm): 0.55 m² (5.92 ft²)
- K Size: 0.26 m² (2.79 ft²)
- A Size: 0.20 m² (2.15 ft²)
- B Size: 0.10 m² (1.07 ft²)
- E Size: 0.05 m² (0.53 ft²)
- Syringe ø50 mm: 16.00 cm² (2.25 in²)

Sterilization
- Gamma-Irradiation: PROPOR SG MURUS & DEMICAP disposable filters can be gamma-irradiated up to a maximum dosage of 40 kGy.

Quality Standards
- Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water and integrity tested prior to despatch. A sample of each lot is tested to demonstrate conformity to validated claims.

Recommended Operating Conditions
- Filter Cartridges: Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperature during CIP to the following limits:
  - 100 °C (212 °F) 1.5 h
  - 121 °C (250 °F) 30 min.

Food and Biological Safety
- Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI and ISO10993 equivalents.

Parker Hannifin certify that this product complies with the European Council Pressure Equipment Directive (PED) 97/23/EC Article 3, Paragraph 3 - Sound Engineering Practice (SEP). This product is intended for use with Group 1 & 2 Dangerous and Harmless Liquids and Group 2 Harmless Gases at the operating conditions stated in this document: In compliance with PED Article 3, Paragraph 3, SEP, this product does not bear the CE mark.

MURUS Disposable Filter Cartridges
- Up to 25 ºC (77 ºF) @ 5.5 barg (79.7 psig) Up to 40 ºC (104 ºF) at line pressures up to 5.0 barg (72 psi)

DEMICAP Filter Cartridges
- Up to 60 ºC (140 ºF) @ 2.8 barg (40.6 psi)

PROPOR SG sterilizing grade filters feature a microbially retentive polyethersulphone membrane for fast, reliable and cost-effective sterile filtration of pharmaceutical fluids. The asymmetric pore structure and high voids volume of the PROPOR SG membrane allow high throughputs and exceptionally high flow rates compared with competitive PES and alternative membranes. Low protein and preservative binding properties minimize product loss due to adsorption.

PROPOR SG filters are optimized for pharmaceutical processing. They have low extractable levels and broad chemical compatibility across the full pH range including organic solvents. Low binding for minimal product loss

MURUS and DEMICAP’s can be gamma-irradiated and autoclaved

Features and Benefits
- Up to 3.5 times higher flow rates than competitive sterilizing grade filters
- Fully validated and integrity testable membrane for assurance of sterility
- Low binding for minimal product loss
- MURUS and DEMICAP’s can be gamma-irradiated and autoclaved

Performance Characteristics

<table>
<thead>
<tr>
<th>Differential Pressure (psi)</th>
<th>Flow (gpm) (US)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>2</td>
<td>6.0</td>
</tr>
<tr>
<td>3</td>
<td>12.0</td>
</tr>
<tr>
<td>4</td>
<td>20.0</td>
</tr>
<tr>
<td>5</td>
<td>27.0</td>
</tr>
</tbody>
</table>

Specifications

Materials of Construction
- Filtration Membrane: Polyethersulphone
- Upstream Support: Polyester
- Downstream Support: Polyester
- End Caps: 316L Stainless Steel
- End Caps Insert: 316L Stainless Steel
- Core: Polypropylene
- Sleeves: Polypropylene
- Capsule Body: Nylon
- Capsule Vent Seals: Silicone
- Capsule Body: Nylon
- Capsules Vent Seals: Silicone
- Filling Bell: Polycarbonate
- Syringe Filters: Body: Polypropylene

Effective Filtration Area (EFA)
- 10¨ (250 mm): 0.55 m² (5.92 ft²)
- K Size: 0.26 m² (2.79 ft²)
- A Size: 0.20 m² (2.15 ft²)
- B Size: 0.10 m² (1.07 ft²)
- E Size: 0.05 m² (0.53 ft²)
- Syringe ø50 mm: 16.00 cm² (2.25 in²)

Sterilization
- Gamma-Irradiation: PROPOR SG MURUS & DEMICAP disposable filters can be gamma-irradiated up to a maximum dosage of 40 kGy.

Quality Standards
- Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water and integrity tested prior to despatch. A sample of each lot is tested to demonstrate conformity to validated claims.

Recommended Operating Conditions
- Filter Cartridges: Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperature during CIP to the following limits:
  - 100 °C (212 °F) 1.5 h
  - 121 °C (250 °F) 30 min.

Food and Biological Safety
- Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI and ISO10993 equivalents.

Parker Hannifin certify that this product complies with the European Council Pressure Equipment Directive (PED) 97/23/EC Article 3, Paragraph 3 - Sound Engineering Practice (SEP). This product is intended for use with Group 1 & 2 Dangerous and Harmless Liquids and Group 2 Harmless Gases at the operating conditions stated in this document: In compliance with PED Article 3, Paragraph 3, SEP, this product does not bear the CE mark.

MURUS Disposable Filter Cartridges
- Up to 25 ºC (77 ºF) @ 5.5 barg (79.7 psig) Up to 40 ºC (104 ºF) at line pressures up to 5.0 barg (72 psi)

DEMICAP Filter Cartridges
- Up to 60 ºC (140 ºF) @ 2.8 barg (40.6 psi)
**Performance Characteristics**

**TOC / Conductivity**
The filtrate quality from a 10¨ (250 mm) PROPOR SG conforms to the requirements of current USP <643> (TOC) and USP <645> (conductivity) within the first 200 ml flush of purified water.

**Endotoxins**
Aqueous extracts from the 10¨ (250 mm) PROPOR SG meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

**Non-Volatile Extractables (NVE)**
Total NVEs extracted from the 10¨ (250 mm) cartridge are <10 mg. Total NVEs extracted from the first 5 litre flush of purified water for an A size 7.9¨ (200 mm) DEMICAP capsule are <5 mg.

**Pharmaceutical Validation**
A full validation guide is available upon request from Laboratory Services Group (LSG).

**Retention Characteristics**
PROPOR SG filter cartridges are validated by bacterial challenge testing with *Brevundimonas diminuta* to current ASTM F838-05 methodology (10^7 organisms / cm² EFA minimum) with typical in-house challenge levels being 10^7 organisms per 10¨ (250 mm) filter cartridge.

**Integrity Test Data**
All filters are integrity testable to the following limits when wet with water and using air as the test gas.

**Ordering Information**

**Cartridges**

<table>
<thead>
<tr>
<th>Code</th>
<th>Length (Nominal)</th>
<th>Micron Rating</th>
<th>Inlet Connection</th>
<th>Outlet Connection</th>
<th>Grade</th>
<th>Code</th>
<th>Code</th>
<th>Code</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZCSG</td>
<td>10¨</td>
<td>0.2 µm</td>
<td>Female Luer Lock</td>
<td>Female Luer Lock</td>
<td>Pharmaceutical</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>ZLSG</td>
<td>5¨</td>
<td>0.2 µm</td>
<td>Female Luer Lock</td>
<td>Female Luer Lock</td>
<td>Pharmaceutical</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>ZESG</td>
<td>5¨</td>
<td>0.2 µm</td>
<td>Female Luer Lock</td>
<td>Female Luer Lock</td>
<td>Pharmaceutical</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>ZSSG</td>
<td>5¨</td>
<td>0.2 µm</td>
<td>Female Luer Lock</td>
<td>Female Luer Lock</td>
<td>Pharmaceutical</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
</tbody>
</table>

**DEMICAP Capsules**

<table>
<thead>
<tr>
<th>Code</th>
<th>Diameter</th>
<th>Micron Rating</th>
<th>Inlet Connection</th>
<th>Outlet Connection</th>
<th>Grade</th>
<th>Code</th>
<th>Code</th>
<th>Code</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>050</td>
<td>50 mm</td>
<td>0.2 µm</td>
<td>Female Luer Lock</td>
<td>Female Luer Lock</td>
<td>Pharmaceutical</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
</tbody>
</table>

**Syringe Filters**

<table>
<thead>
<tr>
<th>Code</th>
<th>Diameter</th>
<th>Micron Rating</th>
<th>Inlet Connection</th>
<th>Outlet Connection</th>
<th>Grade</th>
<th>Code</th>
<th>Code</th>
<th>Code</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>22 G</td>
<td>0.2 µm</td>
<td>Female Luer Lock</td>
<td>Female Luer Lock</td>
<td>Pharmaceutical</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
</tbody>
</table>

**Protein Adsorption (mg / cm²)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Diameter</th>
<th>Micron Rating</th>
<th>Inlet Connection</th>
<th>Outlet Connection</th>
<th>Grade</th>
<th>Code</th>
<th>Code</th>
<th>Code</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSSG</td>
<td>5¨</td>
<td>0.2 µm</td>
<td>Female Luer Lock</td>
<td>Female Luer Lock</td>
<td>Pharmaceutical</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
</tbody>
</table>

**Non-Volatile Extractables (NVE)**
Total NVEs extracted in the first 5 litre flush of purified water for a 10¨ (250 mm) cartridge are <10 mg. Total NVEs extracted in the first 5 litre flush of purified water for an A size 7.9¨ (200 mm) DEMICAP capsule are <5 mg.

**Total NVEs extracted in the first 5 litre flush of purified water for a 10¨ (250 mm) cartridge are <10 mg. Total NVEs extracted in the first 5 litre flush of purified water for an A size 7.9¨ (200 mm) DEMICAP capsule are <5 mg.

**Differential Pressure Comparison**

<table>
<thead>
<tr>
<th>Code</th>
<th>Diameter</th>
<th>Micron Rating</th>
<th>Inlet Connection</th>
<th>Outlet Connection</th>
<th>Grade</th>
<th>Code</th>
<th>Code</th>
<th>Code</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZCSG</td>
<td>10¨</td>
<td>0.2 µm</td>
<td>Female Luer Lock</td>
<td>Female Luer Lock</td>
<td>Pharmaceutical</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>ZLSG</td>
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<td>P</td>
<td>P</td>
<td>P</td>
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</tbody>
</table>

**Diffusional Flow (barg)**

<table>
<thead>
<tr>
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<th>Micron Rating</th>
<th>Inlet Connection</th>
<th>Outlet Connection</th>
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**Protein binding on membrane materials**

- Total NVEs extracted in the first 5 litre flush of purified water for a 10¨ (250 mm) cartridge are <10 mg.
- Total NVEs extracted in the first 5 litre flush of purified water for an A size 7.9¨ (200 mm) DEMICAP capsule are <5 mg.

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</tbody>
</table>
PROPOR HC Filter Cartridges

• liquid filters
• polyethersulphone

PROPOR HC sterilizing grade filters have been specifically designed for the effective and economical processing of difficult to filter solutions. The optimised PROPOR HC PES membrane configuration features a highly asymmetric membrane prefilter layer, which significantly extends throughput and prevents the problems associated with premature filter blockage with complex solutions. PROPOR HC filters are high capacity and fast flowing. The PES membrane is inherently low binding, which minimizes product loss due to protein or preservative adsorption. The filters have low extractable levels and broad chemical compatibility.

Features and Benefits

• Optimized membrane configuration allows up to ten times the throughput compared to single layer membrane products
• Integral prefilter layer can condense filter trains for greater processing economy
• Low binding for minimal product loss

Performance Characteristics

Flow (L/min) for liquid @ 20 °C and 1 cp

<table>
<thead>
<tr>
<th>Differential Pressure (mbar)</th>
<th>Flow (L/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>0.4</td>
</tr>
<tr>
<td>0.2</td>
<td>0.8</td>
</tr>
<tr>
<td>0.3</td>
<td>1.2</td>
</tr>
<tr>
<td>0.4</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Effective Filtration Area (EFA)

<table>
<thead>
<tr>
<th>Size</th>
<th>Area (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10&quot; (250 mm)</td>
<td>0.55 m²</td>
</tr>
<tr>
<td>K Size</td>
<td>0.26 m²</td>
</tr>
<tr>
<td>A Size</td>
<td>0.20 m²</td>
</tr>
<tr>
<td>B Size</td>
<td>0.10 m²</td>
</tr>
<tr>
<td>E Size</td>
<td>0.05 m²</td>
</tr>
<tr>
<td>Syringe 050 mm</td>
<td>16.50 cm²</td>
</tr>
</tbody>
</table>

Syringe ø50 mm: 14.50 cm (2.25 in)

Recommended Operating Conditions

Filter Cartridge

Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Max. Forward dP (bar)</th>
<th>Max. Reverse dP (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5.0</td>
<td>4.0</td>
</tr>
<tr>
<td>10</td>
<td>6.8</td>
<td>6.0</td>
</tr>
<tr>
<td>20</td>
<td>8.6</td>
<td>8.0</td>
</tr>
</tbody>
</table>

Gamma-Irradiation

PROPOR HC MURUS & DEMICAP disposable filters can be gamma-irradiated up to a maximum dosage of 60 kGy.

Quality Standards

Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water and integrity tested prior to despatch. A sample of each lot is tested to demonstrate conformity to validated claims.

PROPOR HC filter cartridges can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Food and Biological Safety

Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Materials of Construction

Filtration Membrane: Polyethersulphone
Prefilter Membrane: Polyethersulphone
Upstream Support: Polyester
Downstream Support: Polyester
Inner Support Core: Polypropylene
Outer Protection Cage: Polypropylene
End Caps: Nylon
Capsule Body: Polypropylene
Capsules Vent Seals: Silicone
Capsules Vent Seals: Silicone
Capsules Core: Polypropylene
Capsules Sleeve: Polypropylene
Capsules End Caps: Nylon
Capsule Filling Bell: Polycarbonate
Syringe Filters Body: Polypropylene
Syringe Filters End Caps Insert: 316L Stainless Steel
Syringe Filters Capsule Body: Polypropylene
Syringe Filters Capsules Vent Seals: Silicone
Syringe Filters Capsules Core: Polypropylene
Syringe Filters Capsules Sleeve: Polypropylene
Syringe Filters Capsules End Caps: Nylon
Syringe Filters Capsules Filling Bell: Polycarbonate

Recommended maximum cleaning and sterilization parameters: 121 °C (249 °F), 30 minutes (30 min.), 130 °C (266 °F), 5 cycles.

Temperature (°C) | Pressure (bar) | Temperature (°C) | Pressure (bar) |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5.0</td>
<td>60</td>
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<tr>
<td>10</td>
<td>6.8</td>
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<tr>
<td>20</td>
<td>8.6</td>
<td>120</td>
<td>3.0</td>
</tr>
<tr>
<td>30</td>
<td>10.1</td>
<td>150</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Notes: PROPOR and DEMICAP are registered trademarks of Parker domnick hunter.
PROPOR HC Filter Cartridges

**Performance Characteristics**

**TOC / Conductivity**
The filtrate quality from a 10¨ (250 mm) PROPOR HC conforms to the requirements of current USP <63> (TOC) and USP <65> (conductivity) within the first 200 ml flush of purified water.

**Endotoxins**
Aqueous extracts from the 10¨ (250 mm) PROPOR HC contain < 0.25 EU/ml when tested in accordance with the Limulus Amoebocyte Lysate test.

**Non-Volatile Extractables (NVE)**
Total NVEs extracted in the first 5 litre flush of purified water for a 10¨ (250 mm) cartridge are <10 mg.

Total NVEs extracted in the first 5 litre flush of purified water for an A size 7.9¨ (200 mm) DEMICAP capsule are <5 mg.

**Pharmaceutical Validation**
A full validation guide is available upon request from Laboratory Services Group (LSG).

---

**Retention Characteristics**
PROPOR HC filter cartridges are validated by bacterial challenge testing with *Brevundimonas diminuta* to current ASTM F838-05 methodology (10 organisms / cm²; EFA minimum) with typical in-house challenge levels being 10³ organisms per 10⁵ (250 mm) filter cartridge.

**Integrity Test Data**
All filters are integrity testable to the following limits when wet with water and using air as the test gas.

- Max. Diffusional Flow (10¨) 18.0 (ml / min) (K) 8.4 (A) 6.7 (B) 3.2 (E) 1.4
- Filter Cartridges: MURUS / DEMICAP / Syringe Filters
  - Min. Bubble Point (barg) 3.4 (psig) 49.0
  - Test Pressure (psig) 40.6
  - Total NVEs extracted in the first 5 litre flush of purified water for a 10¨ (250 mm) cartridge are <10 mg.
  - Total NVEs extracted in the first 5 litre flush of purified water for an A size 7.9¨ (200 mm) DEMICAP capsule are <5 mg.

**Protein Binding on Membrane Materials**

<table>
<thead>
<tr>
<th>Material</th>
<th>Code</th>
<th>Grade</th>
<th>Design</th>
<th>Accessory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nylon Polypropylene</td>
<td>PVDF</td>
<td>P</td>
<td>Triangle</td>
<td>Filling Bell</td>
</tr>
<tr>
<td>Polysulphone</td>
<td>PES</td>
<td>P</td>
<td>Triangle</td>
<td>Filling Bell</td>
</tr>
<tr>
<td>Membrane Material</td>
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<td>Grade</td>
<td>Design</td>
<td>Accessory</td>
</tr>
<tr>
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</tbody>
</table>

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**Oxidizable Substances**
PROPOR HC filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

**Ordering Information**

**Cartridges**

<table>
<thead>
<tr>
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**MURUS Capsules**

<table>
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**DEMICAP Capsules**

<table>
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**Syringe Filters**

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**Pharmaceutical Validation**
A full validation guide is available upon request from Laboratory Services Group (LSG).
PROPOR LR Filter Cartridges

- Liquid filters
- polyethersulphone

Features and Benefits

- Fully correlated against Ralstonia pickettii and integrity testable
- Increases retention efficiency whilst maintaining existing 0.2 micron rated system size
- Up to 2.5 times higher flow rate than competitive 0.1 micron rated filters
- MURUS and DEMICAP’s can be gamma-irradiated and autoclaved

Performance Characteristics

- MURUS flow rates (10” Size (250 mm))
- DEMICAP flow rates

Specifications

Materials of Construction
- Filtration Membrane: Polyethersulphone
- Upstream Support: Polyester
- Downstream Support: Polyester

Filter Cartridges
- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: 316L Stainless Steel

MURUS Disposable Filter Capsules
- Core: Polypropylene
- Sleeve: Polypropylene
- End Caps Insert: Silicone
- Capsule Body: Polypropylene
- Capsule Vent Seals: Silicone

DEMICAP Filter Capsules
- Core: Polypropylene
- Sleeve: Polypropylene
- Capsule Body: Nylon
- Capsule Vent Seals: Silicone
- Filling Bell: Polycarbonate

Syringe Filters
- Body: Polypropylene
- Core: Polypropylene
- Capsules Vent Seals: Silicone
- Capsule Body: Nylon
- Sleeve: Polypropylene
- End Caps: Nylon

Recommended Operating Conditions

Filter Cartridges

<table>
<thead>
<tr>
<th>Temperature  °C</th>
<th>Flow (L/min) for liquid @ 20 °C and 1 cp</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>0.5</td>
</tr>
<tr>
<td>10</td>
<td>1.0</td>
</tr>
<tr>
<td>15</td>
<td>1.5</td>
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<tr>
<td>20</td>
<td>2.0</td>
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<td>25</td>
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<td>30</td>
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<td>85</td>
<td>8.5</td>
</tr>
<tr>
<td>90</td>
<td>9.0</td>
</tr>
</tbody>
</table>

Notes:
- PROPOR and DEMICAP are registered trademarks of Parker domnick hunter.
- MURUS and DEMICAP filters can be gamma-irradiated up to a maximum dosage of 40 kGy.
- Not all microorganisms can be gamma-irradiated up to a maximum dosage of 40 kGy.
- Pharmaceuticals grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water and integrity tested prior to despatch. A sample of each lot is tested to demonstrate conformity to validated claims.

Quality Standards

- Food and Biological Safety Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

Gamma-Irradiation

- MURUS Disposable Filter Capsules
- DEMICAP Filter Capsules
- Syringe Filters

- MURUS and DEMICAP’s can be gamma-irradiated and autoclaved

Up to 20 °C (77 °F) @ 5.5 barg (79.7 psig) Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)

Effective Filtration Area (EFA)

<table>
<thead>
<tr>
<th>Size</th>
<th>EFA (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K Size</td>
<td>0.55 m²</td>
</tr>
<tr>
<td>A Size</td>
<td>0.20 m²</td>
</tr>
<tr>
<td>B Size</td>
<td>0.10 m²</td>
</tr>
<tr>
<td>E Size</td>
<td>0.05 m²</td>
</tr>
</tbody>
</table>

Sterilization

- MURUS Disposable Filter Capsules
- DEMICAP Filter Capsules
- Syringe Filters

- MURUS disposable filters can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker domnick hunter contact.

Recommended Operating Conditions

Filter Cartridges

<table>
<thead>
<tr>
<th>Temperature  °C</th>
<th>Pressure (Bar)</th>
<th>Flow (L/min) for liquid @ 20 °C and 1 cp</th>
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<tr>
<td>5</td>
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<td>0</td>
</tr>
<tr>
<td>10</td>
<td>1.0</td>
<td>0.5</td>
</tr>
<tr>
<td>15</td>
<td>1.5</td>
<td>1.0</td>
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<tr>
<td>20</td>
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<tr>
<td>25</td>
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Recommended Operating Conditions

Filter Cartridges

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<th>Temperature  °C</th>
<th>Pressure (Bar)</th>
<th>Flow (L/min) for liquid @ 20 °C and 1 cp</th>
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Filter Cartridges

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<th>Pressure (Bar)</th>
<th>Flow (L/min) for liquid @ 20 °C and 1 cp</th>
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MURUS Disposable Filter Capsules

- Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)
- Up to 40 °C (104 °F) 8.0 barg (114 psig)
- Parker Hannifin certify that the product complies with the European Council Pressure Equipment Directive (97/23/EC) Article 3, Paragraph 3 - Sound Engineering Practice (SEP).

This product is intended for use with Group 1 & 2 Dangerous Operating Conditions stated in this document: In compliance with PED Article 3, Paragraph 3, SEP, this product does not bear the CE mark.

DEMICAP Filter Capsules

- Up to 50 °C (122 °F) at line pressures up to 5.0 barg (72 psig)
PROPOR LR Filter Cartridges

Performance Characteristics

TOC / Conductivity
The filtrate quality from a 10" (250 mm) PROPOR LR conforms to the requirements of current USP <465> (TOC) and USP <445> (conductivity) within the first 200 ml flush of purified water.

Endotoxins
Aqueous extracts from the 10" (250 mm) PROPOR LR contain < 0.25 EU/ml when tested in accordance with the Limulus Amoebocyte Lysate test.

Non-Volatile Extractables (NVE)
Total NVEs extracted in the first 5 litre flush of purified water for a 10" (250 mm) PROPOR LR filter cartridge are < 10 mg.

Pharmaceutical Validation
A full validation guide is available upon request from Laboratory Services Group (LSG).

Oxidizable Substances
PROPOR LR filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

Integrity Test Data
All filters are integrity testable to the following limits when wet with water (diffusional flow) and 60 / 40 : IPA / Water (bubble point) using air as the test gas.

Retention Characteristics
PROPOR LR filters are validated by bacterial challenge testing with Ralstonia pickettii and Pseudomonas diminuta to current ASTM F838-05 methodology (~10^7 organisms / cm^2 EPA minimum) with typical in-house challenge levels being ~10^7 organisms per 10" (250 mm) filter cartridge.

Ordering Information

Cartridges

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MURUS Capsules

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DEMICAP Capsules

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Syringe Filters

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10¨ Filter Cartridges / MURUS / DEMICAP / Syringe Filters

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Note: Differential pressure (Differential pressure = log10(volatility) - log10(retention)) is dependent on the system's flow rate and the filter's resistance to flow. The publication information cited above is subject to change. The filter manufacturer's specifications and instructions should be followed carefully before using the product.
TETPOR HP filter cartridges have been specially designed to minimize protein and preservative binding in the sterilization of pharmaceutical and multi-dose ophthalmic solutions.

Ad sorption of proteins or preservatives from a pharmaceutical preparation onto the filter membranes can complicate the manufacturing process and lead to costly product wastage. The unique hydrophilic PTFE membrane featured in the TETPOR HP exhibits lower levels of binding than other commonly used filtration membranes such as PES and PVDF which can prevent product loss during processing.

The TETPOR HP exhibits low extractable levels and the sterilizing grade membrane has comparative flow rates to PES and PVDF products. Its hydrophilicity is stable to both chemicals and heat. The product also offers an exceptionally broad range of chemical compatibility making it well suited to the processing of aggressive aqueous liquids.

Features and Benefits
- Exceptionally low binding membranes to prevent costly product loss and process down time
- Incorporates a fully validated and integrity testable 0.2 micron membrane for assurance of sterility
- Fast flowing membrane for increased process efficiency

Specifications

Materials of Construction
- Membrane Material
  - Pore Size: 0.2 µm
  - Membrane Material: Hydrophilic PTFE
  - Upstream Support: Polypropylene
  - Downstream Support: Polypropylene
  - Inner Support Core: Polypropylene
  - Outer Protection Cage: Polypropylene
  - End Caps: Polypropylene
  - Standard o-rings: Silicone

Quality Standards
- Pharmacological grade products are manufactured in accordance with cGMP, 100 % flushed with pharmaceutical purified water and integrity tested prior to dispatch. A sample of each lot is tested to demonstrate conformity to validity claims.

TDOC / Conductivity
- The filtrate quality from a 10¨ (250 mm) TETPOR HP conforms to the requirements of current USP <643> (TOC) and USP <645> (conductivity) within the first 200 ml flush of purified water.

Endotoxins
- Aqueous extract from the 10¨ (250 mm) TETPOR HP contain < 0.25 EU / ml when tested in accordance with the Limulus Amoebocyte Lysate test.

Non-Volatile Extractables [NVE]
- The quantity of NVE’s obtained from a 10¨ (250 mm) TETPOR HP cartridges during a 24 hour static soak was undetectable compared to a control sample.

Oxidizable Substances
- TETPOR HP filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a <1 litre water flush.

Retention Characteristics
- TETPOR HP filter cartridges are validated to withstand 10 steam-in-place cycles at 135 °C (275 °F). TETPOR HP filter cartridges are validated to withstand 10 steam-in-place cycles at 135 °C (275 °F).

Performance Characteristics

Flow (gpm) for liquid @ 20 °C and 1 cp

Ordering Information

Code | Length (mm) | Code | Color | Code | Color | Code | Code
--- | --- | --- | --- | --- | --- | --- | ---
020 | 0.2 µm | 082 | 0.2 µm | 050 | HP Hydrophilic PTFE | P-7 | P-7

TETPOR is a registered trademark of Parker domnick hunter
TETPOR LIQUID filters are particularly suitable for sterilization and particulate removal from aggressive chemicals (including acids, bases and solvents) within a wide range of critical processing industries.

The superior performance, strength and durability of TETPOR LIQUID filters stems from the use of a single layer, high security PTFE membrane, which has a high dirt holding capacity due to its high voids volume. This results in low pressure drops and long service life.

High flow rates are achieved due to the optimized pleat pack density and the superior design construction of TETPOR LIQUID filters.

Features and Benefits

- Superior chemical resistance of PTFE membrane combined with polypropylene hardware
- Integrity tested prior to despatch
- Validated to ASTM F838-05 methodology
- Comprehensive range of end cap configurations for retrofitting

Performance Characteristics

- Differential pressure
- Flow (L/min) for liquid @ 20 °C and 1 bar
- Flow (L/min) for liquid @ 20 °C and 1 bar

Specifications

**Materials of Construction**
- Filtration Membrane: PTFE
- Upstream Support: Polypropylene
- Downstream Support: Polypropylene
- Inner Support Core: Polypropylene
- Outer Protection Cage: Polypropylene
- End Caps: Polypropylene
- End Caps Insert: 316L Stainless Steel
- Standard o-rings/gaskets: Silicone

**Effective Filtration Area (EFA)**
- 10" (250 mm): 0.77 m² (8.28 ft²)
- K Size: 0.36 m² (3.87 ft²)
- A Size: 0.25 m² (2.69 ft²)
- B Size: 0.12 m² (1.29 ft²)
- E Size: 0.06 m² (0.66 ft²)
- Syringe ø50 mm: 14.50 cm² (2.25 in²)

**Quality Standards**
- Pharmaceutical grade products are manufactured in accordance with cGMP, 100% flushed with pharmaceutical grade purified water and integrity tested prior to despatch. A sample of each lot is tested to demonstrate conformity to validated claims.

**Recommended Operating Conditions**
- Up to 70 °C (158 °F) continuous operating temperature and higher short-term temperatures during CIP to the following limits:
- Temperature: Max. Forward dP
- °C  °F (bar) (psi)
- 20  68  5.0  72.5
- 40  104  4.0  58.0
- 60  140  3.0  43.5
- 80  176  2.0  29.0
- 90  194  1.7  24.6

**Sterilization**
- MURUS Disposable Filter Capsules
  - Core: Polypropylene
  - Sleeve: Polypropylene
  - End Caps Insert: 316L Stainless Steel
  - Capsule Body: Polypropylene
  - Capsule Vent Seals: Silicone

- DEMICAP Filter Capsules
  - Core: Polypropylene
  - Sleeve: Polypropylene
  - End Caps: Polypropylene
  - Capsule Body: Polypropylene
  - Capsule Vent Seals: Silicone
  - Filling Bed: Polypropylene

**Recommended Operating Conditions**
- Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)
- Up to 40 °C (104 °F) at line pressures up to 5.0 barg (72 psig)

**Flow Rates**
- For K size for a given flow rate multiply 10¨ size differential pressure by 2
- For A size for a given flow rate divide B size differential pressure by 2
- For E size for a given flow rate multiply B size differential pressure by 2

**TETPOR LIQUID filter cartridges can be sanitized with hot water at up to 90 °C (194 °F) and are compatible with a wide range of chemicals.**

For detailed operational procedures and advice on cleaning and sterilization, please contact the Technical Support Group through your usual Parker Hannifin contact.

**Food and Biological Safety**
- Materials conform to the relevant requirements of 21CFR Part 177 and current USP Plastics Class VI - 121 °C and ISO10993 equivalents.

**Performance Characteristics**

- Differential pressure
- Flow (L/min) for liquid @ 20 °C and 1 bar
- Flow (L/min) for liquid @ 20 °C and 1 bar

**MURUS Disposable Filter Capsules**
- Up to 25 °C (77 °F) @ 5.5 barg (79.7 psig)
- Up to 60 °C (140 °F) @ 2.8 barg (40.6 psig)

**DEMICAP Filter Capsules**
- Up to 40 °C (104 °F) at line pressures up to 5.0 barg (72 psig)


This product is intended for use with Group 1 & 2 Zengenics and Henries, Liquids and Group 2 Harmens and Gases as the operating conditions stated in this document. In compliance with PED Article 3, Paragraph 3, 0EDF this product does not bear the CE mark.

Parker Hannifin is a registered trademark of Parker Hannifin Corporation.
Performance Characteristics

TOC / Conductivity
The filtrate quality from a 10¨ (250 mm) TETPOR LIQUID conform to the requirements of current USP <643> (TOC) and USP <645> (conductivity).

Endotoxins
Aqueous extracts from the 10¨ (250 mm) TETPOR LIQUID contain < 0.25 EU/ml when tested in accordance with the Limulus Amebocyte Lysate test.

Non-Volatile Extractables (NVE)
Total NVEs extracted in the first 5 litre flush of purified water for a 10¨ (250 mm) cartridge are <5 mg.

Pharmaceutical Validation
A full validation guide is available upon request from Laboratory Services Group (LSG).

Oxidizable Substances
TETPOR LIQUID filter cartridges meet current USP and EP quality standards for sterile purified water for oxidizable substances following a 1 litre water flush.

Integrity Test Data
All filters are integrity testable to the following limits when wet with 60/40 IPA / Water and using air as the test gas.

Retention Characteristics
TETPOR LIQUID filter cartridges are validated by bacterial challenge testing with Brevundimonas diminuta to current ASTM E288-95 methodology (10³ organisms / cm² EPA minimum) with typical in-house challenge levels being 10⁴ organisms per 10¨ (250 mm) filter cartridge.

TOC / Conductivity
Oxidizable Substances
Retention Characteristics
Ordering Information

Cartridge Guides

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Min. Bubble Point (barg) 1.3 1.0 0.7 -
Test Pressure (psig) 18.8 14.5 10.1 -

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Min. Bubble Point (barg) 1.3 1.0 0.7 -
Test Pressure (psig) 18.8 14.5 10.1 -

DEMICAP Capsules

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Min. Bubble Point (barg) 1.3 1.0 0.7 -
Test Pressure (psig) 18.8 14.5 10.1 -

Syringe Filters

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<td>0.2 µm</td>
<td>0.2</td>
<td>0.2 µm</td>
<td>0.2</td>
<td>0.2 µm</td>
<td>3</td>
<td>10¨</td>
<td>5</td>
<td>5¨</td>
</tr>
</tbody>
</table>

Min. Bubble Point (barg) 1.3 1.0 0.7 -
Test Pressure (psig) 18.8 14.5 10.1 -

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