**Microgard™ Liquid Filters**

UPE and nylon liquid filters delivering superior cleanliness and high retention capabilities and eliminating potential sources of contamination in bulk chemical systems

Microgard™ filters deliver high-purity solutions for bulk chemicals and bulk chemical distribution systems, and eliminate potential sources of contamination by removing particles and gels at the start of the process. Manufactured in a world-class cleanroom environment, Microgard filters ensure better initial cleanliness, lower contaminant extractables than polypropylene (PP), and higher chemical compatibility in solvents than polysulfone (PS) or polyethersulfone (PES) membranes.

**Choice of UPE or Nylon Membranes**

Microgard filters are constructed of ultra-high molecular weight polyethylene (UPE) or nylon membranes, depending on the filter. The UPE membrane, utilized in Microgard Plus, Microgard Plus LE, Microgard UPE, and Microgard UPX, promotes high-purity photochemical filtration with an excellent retention rating. With retention ratings as low as 3 nm, Microgard filters take advantage of some of the tightest membrane technologies available in the market. The asymmetric UPE membrane increases flow and reduces pressure drop, resulting in reduced defects and increased throughput.

The nylon membrane, utilized in Microgard LE Nylon, promotes maximum flow and provides high retention capabilities with its nonsieving retention capabilities. With retention ratings to 10 nm and at twice the thickness of standard nylon filters, Microgard LE Nylon returns twice the performance and ensures low defectivity in advance chemicals. The hydrophilic nylon membrane eliminates prewetting, resulting in reduced chemical usage and less system downtime during filter changeouts.

**Optimized for a Variety of Chemical Applications**

Microgard filters are optimized for filtration of a variety of chemical applications. Microgard Plus, Microgard Plus LE, Microgard PI, Microgard UPE, and Microgard UPX filters are available in an all-polyethylene construction, while the Microgard LE Nylon filter is constructed of a nylon 6 membrane.

With either construction, these filters provide low surfactant binding, excellent wettability, and superior downstream cleanliness and do not require prewetting, making them ideal for solvent-based chemicals.

Microgard PI filters have been optimized for filtration of polyimide and other high-viscosity chemicals. Additional downstream supports ensure ultimate durability in the most demanding applications.

Table 1 summarizes the Microgard filter attributes.
## Table 1. Microgard filter attributes

<table>
<thead>
<tr>
<th>FILTER TYPE</th>
<th>RETENTION</th>
<th>MEMBRANE</th>
<th>CONSTRUCTION</th>
<th>APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microgard</td>
<td>Plus LE</td>
<td>3 nm</td>
<td>Hydrophobic UPE</td>
<td>Asymmetric</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LE Nylon</td>
<td>10 nm</td>
<td>Polyamide (nylon 6)</td>
<td>Asymmetric</td>
<td>Aqueous and solvent-based chemicals</td>
</tr>
<tr>
<td></td>
<td>20 nm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plus</td>
<td>10 nm</td>
<td>Hydrophobic UPE</td>
<td>Symmetric</td>
<td>Solvent-based chemicals</td>
</tr>
<tr>
<td></td>
<td>20 nm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.03 μm</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>0.05 μm</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>0.1 μm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.2 μm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microgard UPE/UPX</td>
<td>0.05 μm</td>
<td>Hydrophobic UPE</td>
<td>Symmetric</td>
<td>Solvent-based chemicals</td>
</tr>
<tr>
<td></td>
<td>0.1 μm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.2 μm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microgard PI</td>
<td>0.2 μm</td>
<td>Hydrophobic UPE</td>
<td>Symmetric</td>
<td>Polyimide and other high-viscosity chemicals</td>
</tr>
<tr>
<td></td>
<td>0.5 μm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.0 μm</td>
<td></td>
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</table>
# Features & Benefits

<table>
<thead>
<tr>
<th>Feature</th>
<th>UPE Filtration</th>
<th>Nylon Filtration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asymmetric and sub 10 nm membrane technology</td>
<td>The asymmetric membrane with retention ratings to 3 nm enables Microgard Plus and Plus LE to increase flow and reduce pressure drop, resulting in reduced defects and increased throughput.</td>
<td>The nylon 6 membrane with retention ratings to 10 nm and at twice the thickness of standard nylon filters enables Microgard LE Nylon to return twice the performance and ensure low defectivity in advance chemicals.</td>
</tr>
<tr>
<td>Lower cost of ownership</td>
<td>Microgard filters do not require prewetting with solvent-based photochemicals, resulting in lower operational costs and a more consistent, reliable process.</td>
<td>Microgard LE Nylon eliminates prewetting, resulting in reduced chemical usage while minimizing system downtime during filter changeouts.</td>
</tr>
<tr>
<td>Reduced particle contamination</td>
<td>The all-polyethylene UPE construction lowers metallic and ionic contamination that can leach from other materials.</td>
<td>The proprietary cleaning technology of the Microgard LE Nylon filter delivers the lowest levels of organic, metal extractables, and particle shedding.</td>
</tr>
<tr>
<td>Optimized for a variety of chemical applications</td>
<td>The Microgard Plus, Microgard Plus LE, Microgard PI, Microgard UPE, and Microgard UPX filters provide low surfactant binding, excellent wettability, and superior downstream cleanliness and do not require prewetting, making them ideal for solvent-based chemicals.</td>
<td>Microgard LE Nylon offers superior wettability, making it ideal for aqueous and solvent-based chemicals.</td>
</tr>
<tr>
<td></td>
<td>Microgard PI has been optimized for filtration of polyimide and other high-viscosity chemicals.</td>
<td></td>
</tr>
</tbody>
</table>
## Microgard Plus, Plus LE, and LE Nylon Filters

### SPECIFICATIONS

<table>
<thead>
<tr>
<th></th>
<th>PLUS/PLUS LE</th>
<th>LE NYLON</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials of construction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Membrane</td>
<td>Hydrophobic UPE</td>
<td>Polyamide (nylon 6)</td>
</tr>
<tr>
<td>Surface area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4” UPX</td>
<td>10 nm</td>
<td>9200 cm² (9.9 ft²)</td>
</tr>
<tr>
<td>Others</td>
<td>Others</td>
<td>8000 cm² (8.6 ft²)</td>
</tr>
<tr>
<td>10” UPX</td>
<td>10 nm</td>
<td>13,200 cm² (14.21 ft²)</td>
</tr>
<tr>
<td>20 nm</td>
<td>12,000 cm² (12.9 ft²)</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>10,000 cm² (10.7 ft²)</td>
<td></td>
</tr>
<tr>
<td>20” UPX</td>
<td>20 nm</td>
<td>24,000 cm² (25.8 ft²)</td>
</tr>
<tr>
<td>Others</td>
<td>20,000 cm² (21.5 ft²)</td>
<td></td>
</tr>
<tr>
<td>30” UPX</td>
<td>30,000 cm² (32.3 ft²)</td>
<td></td>
</tr>
<tr>
<td>10” asym.</td>
<td>11,600 cm² (12.5 ft²)</td>
<td></td>
</tr>
<tr>
<td>20” asym.</td>
<td>23,200 cm² (25 ft²)</td>
<td></td>
</tr>
<tr>
<td>Supports, core, sleeve</td>
<td>HDPE</td>
<td></td>
</tr>
<tr>
<td>O-ring</td>
<td>EPDM and E-FKM</td>
<td>E-FKM</td>
</tr>
<tr>
<td><strong>Maximum operating conditions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum forward differential pressure:</td>
<td>0.34 MPa (3.4 bar, 50 psid, 3.5 kg/cm²) @ 20°C (68°F)</td>
<td>Maximum forward differential pressure:</td>
</tr>
<tr>
<td>Maximum reverse differential pressure:</td>
<td>0.24 MPa (2.4 bar 35 psid, 2.5 kg/cm²) @ 20°C (68°F)</td>
<td>Maximum reverse differential pressure:</td>
</tr>
<tr>
<td>Operating temperature:</td>
<td>60°C (140°F)</td>
<td>Operating temperature:</td>
</tr>
</tbody>
</table>
PERFORMANCE DATA

Microgard Plus 10" Filters

Microgard LE Nylon 10" Cartridge Filters

Microgard Plus LE 10" Asymmetric UPE Filters

DIMENSIONS

Microgard Plus/Plus LE/LE Nylon

Code 0

17.3 mm (0.68")

Ø 69 mm (2.72")

10" filter length = 245.0 mm ± 1.5 mm (9.65" ± 0.06")
20" filter length = 489.2 mm ± 3.0 mm (19.26" ± 0.12")
30" filter length = 732.7 mm ± 4.5 mm (28.85" ± 0.18")

10" filter length = 262.5 mm ± 1.5 mm (10.33" ± 0.06")
20" filter length = 506.5 mm ± 3.0 mm (19.94" ± 0.12")
30" filter length = 750.0 mm ± 4.5 mm (29.53" ± 0.18")

End View Chemlock® Key on Cartridge

Ø 95.3 mm (3.75")

10" cartridge with key = 266.5 mm ± 1.5 mm (10.5" ± 0.06")
20" cartridge with key = 510.7 mm ± 3.0 mm (20.11" ± 0.12")

Code 0 4" UPX

Ø 83 mm (3.27") REF

110 mm ± 1.5 mm (4.33" ± 0.06")
127.3 mm ± 1.5 mm (5.01" ± 0.06")
ORDERING INFORMATION

This information serves as a guide (these technical notes included infrequently).

Microgard Plus /Plus LE / LE Nylon Filters: part number

C W K

- K = Optional Chemlock® key attached to cartridge for use with Chemlock housing ONLY

O-ring
LT = E-FKM (Plus)
LE = EPDM (Plus)
ST = E-FKM (Plus LE/LE nylon)
01 = E-FKM O-ring (only 4”)
CT = Special clean for 0.03, 0.05, 0.1, and 0.2 µm with E-FKM o-rings,
(special clean is standard for sub-0.03 µm products)

Retention rating
G = 0.2 µm
V = 0.1 µm
Z = 0.05 µm
Y = 0.03 µm
X = 20 nm
T = 10 nm
F = 5 nm
K = 3 nm

Code
0 = Code 0
S = Code 52-222 with spear

Filter type
A = Symmetric UPE
S = Asymmetric UPE
N = Nylon

Cartridge length
M = M pleat
P = Standard

Pleat
S = 4”
1 = 10”
2 = 20”
3 = 30”

Code
0 = Code 0
S = Code 52-222 with spear

O-ring
LT = E-FKM (Plus)
LE = EPDM (Plus)
ST = E-FKM (Plus LE/LE nylon)
01 = E-FKM O-ring (only 4”)
CT = Special clean for 0.03, 0.05, 0.1, and 0.2 µm with E-FKM o-rings,
(special clean is standard for sub-0.03 µm products)

K = Optional Chemlock® key attached to cartridge for use with Chemlock housing ONLY

O-ring
LT = E-FKM (Plus)
LE = EPDM (Plus)
ST = E-FKM (Plus LE/LE nylon)
01 = E-FKM O-ring (only 4”)
CT = Special clean for 0.03, 0.05, 0.1, and 0.2 µm with E-FKM o-rings,
(special clean is standard for sub-0.03 µm products)
Microgard UPE/UPX Filters

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Materials of construction</th>
<th>UPE</th>
<th>UPX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membrane</td>
<td>Hydrophobic UPE</td>
<td></td>
</tr>
<tr>
<td>Surface area</td>
<td>10&quot;</td>
<td>8500 cm² (9.1 ft²)</td>
</tr>
<tr>
<td></td>
<td>20&quot;</td>
<td>17,000 cm² (18.3 ft²)</td>
</tr>
<tr>
<td></td>
<td>30&quot;</td>
<td>25,500 cm² (27.4 ft²)</td>
</tr>
<tr>
<td>Supports, core, sleeve</td>
<td>HDPE</td>
<td>E-FKM, EPDM</td>
</tr>
<tr>
<td>O-ring</td>
<td>E-FKM or Kalrez® perfluoroelastomer</td>
<td></td>
</tr>
</tbody>
</table>

Maximum operating conditions

- Maximum forward differential pressure: 0.35 MPa (3.5 bar, 50 psid, 3.5 kg/cm²) @ 25°C (77°F)
- Maximum reverse differential pressure: 0.27 MPa (2.7 bar, 40 psid, 2.8 kg/cm²) @ 20°C (68°F)
- Operating temperature: 60°C (140°F)

PERFORMANCE DATA

Microgard UPE Cartridge Filters

- Typical Flow Rate (L/min) 1 cP @ 20°C (68°F)
  - Differential Pressure (bar)
  - GPM

- 0.05 µm
- 0.1 µm
- 0.2 µm

Microgard UPX Cartridge Filters

- Typical Flow Rate (L/min) 1 cP @ 20°C (68°F)
  - Differential Pressure (psid)
  - GPM

- 0.05 µm
- 0.1 µm
- 0.2 µm
**DIMENSIONS**

**Microgard UPE**

**Code 0**

10" filter length = 245.0 mm ±1.5 mm (9.65" ±0.06")
20" filter length = 489.2 mm ±3.0 mm (19.26" ±0.12")
30" filter length = 732.7 mm ±4.5 mm (28.85" ±0.18")

10" filter length = 262.3 mm ±1.5 mm (10.33" ±0.06")
20" filter length = 506.5 mm ±3.0 mm (19.94" ±0.12")
30" filter length = 750.0 mm ±4.5 mm (29.53" ±0.18")

**End View Chemlock Key on Cartridge**

**Code 5**

10" filter length = 183.5 mm ±2.0 mm (7.22" ±0.08")
20" filter length = 347.0 mm ±4.0 mm (13.66" ±0.16")
30" filter length = 499.5 mm ±4.0 mm (19.65" ±0.16")

**Microgard UPX**

**Code 0**

4": 110.0 mm ±1.5 mm (4.33" ±0.06")
10": 225.0 mm ±1.5 mm (8.86" ±0.06")

4": 127.3 mm ±1.5 mm (5.01" ±0.06")
10": 242.3 mm ±1.5 mm (9.54" ±0.06")

**End View Chemlock Key on Cartridge**

**ORDERING INFORMATION**

This information serves as a guide. Please contact your local representative to confirm part numbers.

**Microgard UPE Cartridge Filters:** part number

- **C W U K**
  - **K** = PFA optional Chemlock key for use with Chemlock housing (10" and 20" only)
  - **O-ring**
    - LT = E-FKM
    - LE = EPDM
  - **Cartridge length**
    - 1 = 10"
    - 2 = 20"
  - **Cartridge configuration**
    - 0 = Code 0
    - 5 = Code 5
  - **Retention rating**
    - Z = 0.05 µm
    - G = 0.2 µm
    - V = 0.1 µm

**Microgard UPX Cartridge Filters:** part number

- **C W U O K**
  - **K** = PFA optional Chemlock key for use with Chemlock housing (10" and 20" only)
  - **O-ring**
    - 01 = E-FKM
    - K1 = Kalrez*
  - **Cartridge length**
    - 5 = 4"
    - 1 = 10"
  - **Cartridge configuration**
    - 0 = Code 0
  - **Retention rating**
    - Z = 0.05 µm
    - G = 0.2 µm
    - V = 0.1 µm

*Kalrez O-ring available in 10" configuration only.
Microgard PI Filters

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Materials of construction</th>
<th>Membrane</th>
<th>Hydrophobic UPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface area</td>
<td>0.2 µm</td>
<td>8800 cm² (9.47 ft²)</td>
</tr>
<tr>
<td></td>
<td>0.5 µm, 1.0 µm</td>
<td>8000 cm² (8.6 ft²)</td>
</tr>
<tr>
<td>Supports, core, sleeve</td>
<td>HDPE</td>
<td></td>
</tr>
<tr>
<td>O-ring</td>
<td>E-FKM</td>
<td></td>
</tr>
</tbody>
</table>

Maximum operating conditions
- Maximum forward differential pressure: 0.39 MPa (3.9 bar, 56.6 psid, 4 kg/cm²) @ 25°C (77°F)
- Maximum reverse differential pressure: 0.255 MPa (2.55 bar, 39.3 psid, 2.8 kg/cm²) @ 25°C (77°F)
- Operating temperature: 60°C (140°F)

PERFORMANCE DATA

Microgard PI 10" Cartridge Filters

ORDERING INFORMATION

This information serves as a guide. Please contact your local representative to confirm part numbers.

Microgard PI Cartridge Filters: part number PIA 01P01K

- K = Optional Chemlock key attached to cartridge for use with Chemlock housing ONLY
- Retention rating:
  - G = 0.2 µm
  - H = 0.5 µm
  - A = 1.0 µm

DIMENSIONS

Microgard PI

- 225.0 mm ± 1.5 mm (8.86” ± 0.06”)
- Ø82 mm (3.23”) REF
- 242.3 mm ± 1.5 mm (9.54” ± 0.06”)

End View Chemlock Key on Cartridge

- Ø95.3 mm (3.75”) REF
- 10” cartridge with key = 246.5 mm ± 1.5 mm (9.71” ± 0.06”)