Ultrahigh-Purity Gas Filters

SCF Series
- Membralox® ceramic filtration technology
- Genuine Swagelok® VCR® face seal fittings
- Particle removal rating greater than 99.9999999% at 0.003 µm at maximum flow rate
- Flow rates to 2700 std L/min
SCF Series UHP Filters
The Swagelok SCF series UHP gas filter is designed to meet the stringent requirements of SEMI E49.8-96. With the proprietary Membralox ceramic element and 316L VAR stainless steel housing, the SCF series UHP filter is a solution for many demanding gas filtering applications.

Features
- High particle removal efficiency
- Exceptionally low particle shedding
- Superior moisture dry-down characteristics
- Extremely low outgassing
- Outstanding chemical compatibility
- High differential pressure rating
- Inline, all-welded construction
- Maximum flow rates: 30, 225, 600, 900, and 2700 std L/min
- End connections: 1/4, 1/2, and 3/4 in. integral male VCR face seal fittings; 1/4 in. female VCR face seal fittings
- Industry-standard lengths; see Ordering Information and Dimensions.

Materials of Construction
Ceramic element: high-purity alumina
Gasket: high-density PTFE
Housing: 316L VAR stainless steel/SEMI F20 High-Purity, 20 % minimum elongation allowed

Membralox Ceramic Filtration Technology
The Membralox ceramic element is a multilayered filter medium. The material is a high-purity alumina with a precisely controlled pore structure.

The Membralox ceramic element is an extruded multilow channel block or tubular structure. The flow channels within the structure are coated with precisely controlled membrane layers. A final sintering process fuses the layers together.

The result is a filter element that is designed to minimize particle shedding and provide enhanced flow characteristics. The removal rating of the filter is greater than 99.9999999 % at 0.003 µm when tested in accordance with SEMI F38-0699. The Membralox ceramic element provides both high temperature and chemical resistance, along with superior particle removal and outgassing characteristics.

Technical Data

<table>
<thead>
<tr>
<th>Maximum Flow Rate at Removal Rating</th>
<th>Filtration Area cm² (in.²)</th>
<th>Pressure Rating at 37°C (100°F), psig (bar)</th>
<th>Temperature Rating °C (°F)</th>
<th>Removal Rating</th>
<th>Internal Surface Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>std L/min (std ft³/min)</td>
<td></td>
<td>Working Differential</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 (1.0)</td>
<td>10 (1.6)</td>
<td>3000 (206)</td>
<td>145 (10)</td>
<td>&gt; 99.9999999 %</td>
<td>Electropolished and finished to a roughness average of 5 µm, (0.13 µm) $R_a$</td>
</tr>
<tr>
<td>225 (7.9)</td>
<td>20 (3.1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600 (21)</td>
<td>70 (11)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>900 (31)</td>
<td>150 (23)</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>2700 (95)</td>
<td>450 (70)</td>
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</tbody>
</table>

A scanning electron microscope image shows the two membrane layers of the filter element: ultrafine and fine (as shown from top to bottom).
Flow Rate at Pressure Drop

Maximum Flow Rate: 30 std L/min

Nominal Inlet Pressures
- 14.5 psig (0.9 bar)
- 29.0 psig (1.9 bar)
- 43.5 psig (2.9 bar)
- 58.0 psig (3.9 bar)
- 72.5 psig (4.9 bar)

Maximum Flow Rate: 225 std L/min

Nominal Inlet Pressures
- 14.5 psig (0.9 bar)
- 29.0 psig (1.9 bar)
- 43.5 psig (2.9 bar)
- 58.0 psig (3.9 bar)
- 72.5 psig (4.9 bar)

Maximum Flow Rate: 600 std L/min

Nominal Inlet Pressures
- 30.0 psig (2.0 bar)
- 90.0 psig (6.2 bar)

Maximum Flow Rate: 900 std L/min

Nominal Inlet Pressures
- 30.0 psig (2.0 bar)
- 90.0 psig (6.2 bar)

Maximum Flow Rate: 2700 std L/min

Nominal Inlet Pressures
- 30.0 psig (2.0 bar)
- 60.0 psig (4.1 bar)
- 90.0 psig (6.2 bar)
**Safe Product Selection**
When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.

**Caution: Do not mix or interchange parts with those of other manufacturers.**

**Ordering Information and Dimensions**
Dimensions, in inches (millimeters), are for reference only and are subject to change.

### 3 in. (76.2 mm) Filters—30 and 225 std L/min

<table>
<thead>
<tr>
<th>Flow Rate</th>
<th>Inlet and Outlet</th>
<th>Ordering Number</th>
<th>Dimensions, in. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>1/4 in. integral male VCR fitting</td>
<td>SS-SCF3-VR4-P-30</td>
<td>A: 0.88 (22.4) B: 0.80 (20.3)</td>
</tr>
<tr>
<td></td>
<td>1/4 in. integral male VCR fitting and 1/4 in. female VCR fitting</td>
<td>SS-SCF3-VR4FR4-P-30</td>
<td></td>
</tr>
<tr>
<td>225</td>
<td>1/4 in. integral male VCR fitting</td>
<td>SS-SCF3-VR4-P-225</td>
<td>A: 3.31 (84.1) B: 1.23 (31.2) C: 1.18 (30.0)</td>
</tr>
<tr>
<td></td>
<td>1/4 in. integral male VCR fitting and 1/4 in. female VCR fitting</td>
<td>SS-SCF3-VR4FR4-P-225</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>1/4 in. integral male VCR fitting</td>
<td>SS-SCF3-VR4-P-600</td>
<td>A: 1.42 (36.1) B: 1.67 (42.4)</td>
</tr>
<tr>
<td></td>
<td>1/2 in. integral male VCR fitting</td>
<td>SS-SCF3-VR8-P-600</td>
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</table>

### Testing
Every SCF series filter is helium leak tested to a maximum leak rate of $9 \times 10^{-9}$ std cm$^3$/s.
The SCF series filter design has been helium leak tested to a maximum leak rate of $2 \times 10^{-10}$ std cm$^3$/s.

### Cleaning and Packaging
Every SCF series filter is processed in accordance with Swagelok Ultrahigh-Purity Process Specification (SC-01), MS-06-61.

### Warranty Information
Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit swagelok.com or contact your authorized Swagelok representative.