Energy Saving Compressed Air Filters

NGF SERIES 20 to 1500 scfm (34 to 2459 nm³/h)
Engineering Excellence

SPX FLOW is a place where innovation is valued, and the real needs of business are understood. We transform ideas into powerful solutions to help our customers meet their goals, overcome business challenges and thrive in a complex, always-changing marketplace.

Utilizing the latest technological advancements, NGF Series Compressed Air Filters offer a new way of thinking and innovative approach to efficiently clean compressed air.

Saving Energy Is A Global Priority

Energy costs continue to escalate globally, having a negative impact on plant profitability and production costs. Sustainability initiatives in plant operations must be implemented to maintain a competitive advantage.

Air treatment manufacturers are challenged to design equipment that is cost effective, delivers optimum performance and consumes less energy. The Hankison Next Generation Filter Series is the ideal solution to remove contamination from compressed air systems and save energy.

The Next Generation of Compressed Air Filtration

The NGF Series employs technological advancements in filtration materials and design to ensure premium compressed air quality and low operational costs.

Filters are tested and rated delivering certifiable performance according to ISO 8573-1: 2010 air quality standards.
Sustainable Energy Saving Solutions

The development of sustainable energy savings compressed air treatment solutions is the driving principle behind Hankison product designs. The NGF Series provides the perfect balance between high performance filtration and low pressure drop. Patented filter elements (US 7,618,480 B2) maintain low pressure drop and long service life.

By minimizing resistance to flow, energy costs are significantly reduced. The example demonstrates the effect of pressure drop on operating costs.

Example:
- Model: F15-HF high performance coalescing filter
- Flow: 1030 scfm (1750 nm³/h)
  - Hours of Operation: 8000 hours
  - Operating Pressure: 101.5 psig (6.7 barg)
  - Power Cost: $0.10/kWh
  - Pressure Drop: 1.8 psid (0.12 barg)
  - Cost of Pressure Drop: $870/yr

- Under identical operation conditions, conventional filters maintain a higher cost of ownership:
  - Pressure Drop: 3.3 psid (0.23 barg)
  - Cost of Pressure Drop: $1,596/yr
  - Pressure Drop: 4.8 psid (0.33 barg)
  - Cost of Pressure Drop: $2,321/yr

### NGF Series Pressure Drop Performance*

<table>
<thead>
<tr>
<th>Element Grade</th>
<th>Filter Description</th>
<th>Dry Δp psig</th>
<th>Wetted Δppsig</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF</td>
<td>Bulk Liquid Separator/Filter</td>
<td>0.8</td>
<td>1.0</td>
</tr>
<tr>
<td>PF</td>
<td>General Purpose Filter</td>
<td>0.6</td>
<td>1.4</td>
</tr>
<tr>
<td>HF</td>
<td>High Efficiency Oil Removal Filter</td>
<td>0.6</td>
<td>1.8</td>
</tr>
<tr>
<td>UF</td>
<td>Ultra High Efficiency Oil Removal Filter</td>
<td>0.8</td>
<td>2.0</td>
</tr>
<tr>
<td>CF</td>
<td>Oil Vapor Removal Filter</td>
<td>1.0</td>
<td>-</td>
</tr>
</tbody>
</table>

*Pressure drop not to exceed stated values at ISO 12500 test conditions.
ISO 12500 defines a universal method for manufacturers to test and rate compressed air filters. Critical performance parameters are specified for inlet oil challenge and solid particulate size distribution.

- ISO 12500-1 defines the testing of coalescing filters for oil aerosol removal performance.
- ISO 12500-2 quantifies vapor removal capacity of adsorption filters.
- ISO 12500-3 outlines requirements to test particulate filters for solid contaminant removal.

The NGF Series is tested to ISO 12500. Test results provide certifiable performance data based on defined challenge concentrations.

**NGF Series Filtration Performance**

<table>
<thead>
<tr>
<th>Element Grade</th>
<th>SF</th>
<th>PF</th>
<th>HF</th>
<th>UF</th>
<th>CF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particle Retention Size(^1)</td>
<td>3.0 µm</td>
<td>1.0 µm</td>
<td>0.01 µm</td>
<td>0.01 µm</td>
<td>0.01 µm</td>
</tr>
<tr>
<td>Particle Removal Efficiency</td>
<td>-</td>
<td>99.999+%</td>
<td>99.999+%</td>
<td>99.9999+%</td>
<td>99.999+%</td>
</tr>
<tr>
<td>Oil Removal Efficiency</td>
<td>50%</td>
<td>80%</td>
<td>99.9+%</td>
<td>99.99+%</td>
<td>-</td>
</tr>
<tr>
<td>Remaining Oil Content(^2)</td>
<td>5.0 mg/m³</td>
<td>2.0 mg/m³</td>
<td>&lt; 0.01 mg/m³</td>
<td>&lt; 0.001 mg/m³</td>
<td>&lt; 0.004 mg/m³ (as a vapor)</td>
</tr>
</tbody>
</table>

1 Solid particulate size distribution 0.01 to 5.0 µm
2 Inlet oil challenge concentration 10 mg/m³
And Compressed Air Quality

**ISO 8573-1:2010 Air Quality Standard**

ISO 8573-1, the international standard for compressed air quality, defines the amount of contamination permissible in compressed air.

- The standard identifies three primary forms of contamination in compressed air systems — solid particles, water and oil.
- Contaminants are classified and assigned a quality class, ranging from Class 0, the highest purity level, to Class 9, the most relaxed.

**Quality Class 8573-1: 2010**

<table>
<thead>
<tr>
<th>Element Grade</th>
<th>ISO Quality Class Solids</th>
<th>ISO Quality Class Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>PF</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>HF</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>UF</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>CF</td>
<td>1</td>
<td>1 (as a vapor)</td>
</tr>
</tbody>
</table>

NGF elements are performance validated to ISO 12500 ensuring air quality delivered is in accordance to ISO 8573-1: 2010 classifications.

**ISO 8573-1: 2010 Air Quality Classes**

<table>
<thead>
<tr>
<th>Air Quality Class</th>
<th>Solid Particles</th>
<th>Water Vapor Pressure Dew Point</th>
<th>Oil Total Oil Concentration: Aerosol, Liquid &amp; Vapor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum number of particles per m³</td>
<td>°C</td>
<td>°F</td>
</tr>
<tr>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>≤ 20,000</td>
<td>≤ -70</td>
<td>≤ -94</td>
</tr>
<tr>
<td>2</td>
<td>≤ 400,000</td>
<td>≤ -60</td>
<td>≤ -80</td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>≤ 0.5 microns</td>
<td>≤ -30</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>≤ 5.0 microns</td>
<td>≤ -30</td>
</tr>
<tr>
<td>5</td>
<td>-</td>
<td>≤ 100,000</td>
<td>≤ -30</td>
</tr>
</tbody>
</table>
Patented Venturi-Wave™ Element

1. **Patented Venturi-Wave™ Element Design**
   - The venturi profile promotes a turbulent-free transition for compressed air entering the element
   - Optimized flow distribution through the element minimizes pressure loss and reduces system operating cost
   - Unique backside contour assists smooth movement of air exiting the filter housing

2. **Deep Bed Pleated, High Performance Media**
   - Increased effective filtration surface area, reduces pressure drop by 50%
   - 96% voids-volume ratio optimizes dirt loading capacity
   - HEPA grade micro fiberglass media maximizes efficiency
   - Thermally bonded polyester support layers minimize media migration
   - Low wetted pressure drop for the life of the element
   - Seam welded, stainless steel inner and outer support cores enhance dimensional stability of the element
   - Chemically inert, non-aging polyester drain layer expedites removal of liquid
   - All materials of construction are silicone free

3. **Element Grade Identification**
   - Color coded end caps promote ease of element grade identification
   - Bottom end caps pad printed with genuine Hankison filter element replacement part number

**Element - Materials of Construction**

<table>
<thead>
<tr>
<th>Filter Media</th>
<th>HEPA grade borosilicate fiberglass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner/Outer Support Cores</td>
<td>400 Series stainless steel</td>
</tr>
<tr>
<td>Drainage Layer</td>
<td>Filtration grade polyester</td>
</tr>
<tr>
<td>End Caps</td>
<td>Fiberglass reinforced polyamide resin</td>
</tr>
<tr>
<td>Bonding Agent</td>
<td>Polyurethane</td>
</tr>
<tr>
<td>End Cap Seal</td>
<td>Nitrile</td>
</tr>
</tbody>
</table>
**Sculpted Design**
- Covers flow ranges 20 scfm to 1500 scfm (34 to 2549 nm$^3$/h)
- Flanged inlet and outlet connections make installation easy
- Thirteen flow models, with multiple port sizes, 1/4" to 3" NPT, allow for greater application flexibility
- Sculpted housing designs, with large unrestricted flow paths, reduce pressure drop

**Safety Built-In**
- Die cast aluminium housings provide a cost effective solution in the 1030 to 1500 scfm (1750 to 2549 nm$^3$/h) flow range
- Chromated housings, with a polyester epoxy powder coating for corrosion resistance
- Internally ribbed bowls facilitate condensate draining
- Audible alarm when attempting bowl removal under pressure

**Housing - Materials of Construction**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter Head</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Filter Housing</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Seals</td>
<td>Nitrile</td>
</tr>
<tr>
<td>Chromating Process</td>
<td>Hexavalent-free trivalent</td>
</tr>
<tr>
<td>Exterior Coating</td>
<td>Polyester epoxy powder</td>
</tr>
<tr>
<td>Manual Drain</td>
<td>Brass body, Viton® seal</td>
</tr>
<tr>
<td>Internal Float Drain</td>
<td>Polycetal float, Brass body, Viton® seal and Stainless steel springs</td>
</tr>
</tbody>
</table>
The NGF Series provides protection for the entire compressed air system. A wide range of filters exceeds customer requirements for ISO Quality Class performance, service life and optimal energy savings.

Compressed air contamination exists in three states - solid, liquid and gaseous.

- Ingested contaminants appear in the form of water, hydrocarbons and particulates.
- The compression process introduces lubricant and wear particles into the system.
- Piping distribution and storage tanks foster contaminants in the form of rust, pipe scale and bacteria.

### NGF Series Element Specifications

<table>
<thead>
<tr>
<th>Element Grade</th>
<th>Description</th>
<th>ISO Performance Data</th>
<th>Where Applied</th>
</tr>
</thead>
</table>
| **Grade SF** | Bulk Liquid Separator/Filter | • Removes solids 3 micron and larger  
• Remaining oil content 5 mg/m³ | Downstream of aftercoolers  
At point-of-use if no aftercooler/separator used upstream |
| **Grade PF** | General Purpose Filter | • Removes solids 1.0 micron and larger  
• Remaining oil content 2.0 mg/m³ | Upstream of ultra high efficiency oil removal filters  
At point-of-use if aftercooler/separator installed upstream  
Downstream of heatless desiccant dryers |
| **Grade HF** | High Efficiency Oil Removal Filter | • Removes 99.999+% of solids 0.01 micron and larger  
• Remaining oil content < 0.001 mg/m³ | Upstream of desiccant dryers  
Downstream of refrigerated dryers  
At point-of-use if aftercooler/separator installed upstream |
| **Grade UF** | Ultra High Efficiency Oil Removal Filter | • Removes 99.9999+% of solids 0.01 micron and larger  
• Remaining oil content < 0.0001 mg/m³ | Upstream of desiccant dryers  
Upstream of membrane dryers  
(Use a PF Grade as a prefilter if heavy liquid loads are present)  
Downstream of refrigerated dryers |
| **Grade CF** | Oil Vapor Removal Filter | • Removes solids 0.01 micron and larger  
• Remaining oil content < 0.004 mg/m³ (as a vapor) | Downstream of high efficiency oil removal filters |

ISO 8573.1: 2009 Air Quality Class:
- Solid Particles - Class 3  
- Remaining Oil Content - Class 5  
- Solid Particles - Class 2  
- Remaining Oil Content - Class 4  
- Solid Particles - Class 1  
- Remaining Oil Content - Class 1  
- Solid Particles - Class 1  
- Remaining Oil Content - Class 1
Accessories and Options

The NGF Series is supported by a complete line of accessories and options making filter installation and differential pressure monitoring easy.

### Installation Flexibility

**Filter Connector Clamps**
Stainless steel clamps easily connects filters in series  
Optional (02-17)

**Wall Mount Bracket**
Rugged design provides installation flexibility  
Optional (02-17)

### Pressure Monitoring

**Differential Pressure Slide Indicator**
Color indicator moves based on differential pressure  
Standard SF, PF, UF, HF grades (02-07)

**Differential Pressure Gauge**
Two color gauge face indicates element change-out based on differential pressure  
Standard SF, PF, UF, HF grades (08-17)

### Condensate Management

**Manual Drain**
Condensate may be drained manually through clockwise adjustment  
Standard CF grade (02-12)  
Optional SF, PF, UF, HF grades (02-12)

**No Air Loss Internal Float Drain**
Effectively removes condensate without loss of air  
Standard SF, PF, UF, HF grades (02-12)  
Optional CF grade (02-12)

**No Air Loss Electric Demand Drain**
Efficiently removes condensate based on demand  
Optional (0020-1500)
Filter Selection

Model Configuration

1. Housing-Connection-Flow

<table>
<thead>
<tr>
<th>Model</th>
<th>Connection</th>
<th>Flow @ 100 psig scfm</th>
<th>Flow @ 6.7 barg nm³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>1/4&quot;</td>
<td>20</td>
<td>34</td>
</tr>
<tr>
<td>03</td>
<td>3/8&quot;</td>
<td>35</td>
<td>59</td>
</tr>
<tr>
<td>04</td>
<td>1/2&quot;</td>
<td>50</td>
<td>85</td>
</tr>
<tr>
<td>06</td>
<td>3/4&quot;</td>
<td>75</td>
<td>127</td>
</tr>
<tr>
<td>07</td>
<td>3/4&quot;</td>
<td>103</td>
<td>175</td>
</tr>
<tr>
<td>08</td>
<td>1</td>
<td>157</td>
<td>267</td>
</tr>
<tr>
<td>10</td>
<td>1 1/2&quot;</td>
<td>257</td>
<td>437</td>
</tr>
<tr>
<td>11</td>
<td>1 1/2&quot;</td>
<td>360</td>
<td>612</td>
</tr>
<tr>
<td>12</td>
<td>2&quot;</td>
<td>401</td>
<td>681</td>
</tr>
<tr>
<td>13</td>
<td>2 1/2&quot;</td>
<td>568</td>
<td>965</td>
</tr>
<tr>
<td>14</td>
<td>2 1/2&quot;</td>
<td>775</td>
<td>1317</td>
</tr>
<tr>
<td>15</td>
<td>2 1/2&quot;</td>
<td>1030</td>
<td>1790</td>
</tr>
<tr>
<td>16</td>
<td>3&quot;</td>
<td>1200</td>
<td>2039</td>
</tr>
<tr>
<td>17</td>
<td>3&quot;</td>
<td>1500</td>
<td>2549</td>
</tr>
</tbody>
</table>

* BSP threads are available. Add B to the model number. Example: F02B-SF-DP1

2. Element Grade

- SF: Bulk Liquid Removal
- PF: Particulate Removal
- HF: Oil Removal
- UF: High Efficiency Oil Removal
- CF: Oil Vapor Removal

3. Options

- T: Drain Plug
- D: Internal Automatic Drain
- P1: Differential Pressure Slide Indicator
- G1: Differential Pressure Gauge
- X: External Drain Adapter (02-12)
- W: External Mechanical Drain (14-17)

Example: F02-SF-DP1

Flow and Connection: 20 scfm (34 nm³/h); 1/4" NPT
Element Grade: SF- Bulk Liquid Removal
Options: Internal automatic drain; differential pressure slide indicator

Capacity Correction Factors

NGF Series flow capacities are rated per ISO 12500 conditions @ 100 psig (6.7 barg). To size the filter for non-standard conditions, a correction factor must be applied. Table 1 provides correction factors for inlet air pressure.

Do not select filters by pipe size; use flow rate and operating pressure.

Table 1 - Correction Factors for Inlet Pressure

<table>
<thead>
<tr>
<th>Inlet Pressure</th>
<th>psig</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>60</th>
<th>80</th>
<th>100</th>
<th>120</th>
<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>barg</td>
<td>1.4</td>
<td>2.1</td>
<td>2.8</td>
<td>4.1</td>
<td>5.5</td>
<td>6.9</td>
<td>8.3</td>
<td>10.3</td>
<td>13.8</td>
<td>17.2</td>
<td>20.7</td>
</tr>
<tr>
<td>Correction Factor</td>
<td>0.30</td>
<td>0.39</td>
<td>0.48</td>
<td>0.65</td>
<td>0.82</td>
<td>1.00</td>
<td>1.17</td>
<td>1.43</td>
<td>1.87</td>
<td>2.31</td>
<td>2.74</td>
<td></td>
</tr>
</tbody>
</table>

Adjusted Flow Capacity

To calculate the flow capacity based on non-standard inlet conditions, multiply the filter's rated flow capacity by the corresponding inlet pressure correction factor.

High Efficiency Coalescing Filter: F04-HF-DP1

Rated capacity: 50 scfm (85 nm³/h)

Operating Conditions: 120 psig (8.3 barg)

Adjusted Flow Capacity: 50 scfm x 1.17 = 59 scfm (100 nm³/h)
Product Specifications

Technical Specifications

<table>
<thead>
<tr>
<th>Drain Option</th>
<th>Maximum Operating Pressure</th>
<th>Maximum Operating Temperature</th>
<th>Minimum Operating Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drain Plug</td>
<td>250 psig (17.2 barg)</td>
<td>150°F (66°C)</td>
<td>35°F (2°C)</td>
</tr>
<tr>
<td>Internal Float</td>
<td>250 psig (17.2 barg)</td>
<td>150°F (66°C)</td>
<td>35°F (2°C)</td>
</tr>
<tr>
<td>Externally Mounted Mechanical</td>
<td>150 psig (10.3 barg)</td>
<td>120°F (49°C)</td>
<td>35°F (2°C)</td>
</tr>
</tbody>
</table>
NGF Series
20 to 1500 scfm
(34 to 2459 nm³/h)

Global locations

**SPX FLOW USA**
**HANKISON HEADQUARTERS**
4647 SW 40th Avenue
Ocala, Florida 34474-5788 U.S.A.
P: (724) 745-1555
F: (724) 745-6040
E: hankison.americas@spxflow.com

**HANKISON RENTAL**
**NORTHEAST**
100 Commerce Drive, Suite 40
Washington, PA 15301
P: (724) 225-1470
F: (724) 222-1317
E: hankison.rental@spxflow.com

**SOUTHWEST**
1486 Champion Drive
Terrell, TX 75160 U.S.A.
P: (800) 379-3711
F: (972) 563-9991
E: hankison.rental@spxflow.com

**SPX FLOW CANADA**
1415 California Avenue
Brockville, ON, Canada
k6v 7h7
T: (800) 267-3884
F: (800) 318-0952
E: ft.canada@spxflow.com

**SPX FLOW GERMANY**
Konrad-Zuse-Str. 25
D-47445 Moers Germany
T: (+49) 2841-8190
F: (+49) 2841-87112
E: info@spxdehydration.de

**SPX FLOW ASIA PACIFIC**
5th Floor, Park Center,
No.1568 Huashan Road,
Shanghai China
T: +86 (021) 2208-5840
F: +86 (021) 2208-5866

**SPX FLOW KOREA**
#87, Jangansandan 9-ro,
Jangan-eup, Gijang-gun,
Busan, Rep. of Korea
T: +82 (51) 728-5360
F: +82 (51) 728-5359

**SPX FLOW INDIA**
SPX India Pvt., LTD
Manufacturing G-72/73
Riico Industrial Area
Mansarover, RAJASTHAN
Jaipur 302 020
India
T: (+91) 141-2396759
F:(+91) 141-2395048

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