Bag Filter

**FGF Series**

**Optimum for the large flow filtration**

The bag-stated element (made of non-woven cloth) makes it possible to filtrate the large flow with lower pressure drop. [FGF□1 Series (one element included): Up to 400 L/min]

**Easy maintenance**

Replacement operations are easy thanks to a built-in basket mechanism allowing element replacement outside the vessel.

**Main operating fluids**

- Coolant (oil-based, water-soluble)
- Weak alkali-based cleaning fluid
- Cutting fluid
- Industrial water

* For other kinds of fluids, please contact SMC.

**With safety mechanism**

Employs proprietary SMC latch mechanism and band lock mechanism. Safe even in the event of erroneous operation.

**Improved functionality and operability**

Renewed for easier use!

[FGF□1 Series (one element included)]

- Leg format changed to removable type, improved piping workability on bottom side.
- Easier handling thanks to lightweight band and hinge mechanism.
- Basket features hole for fluid release. Release of foreign matter to the outlet side is prevented.
- Weight: 13 kg (Current model: 19 kg) 32% lighter than the current model

* Applies to FGF□1A

**Variations**

<table>
<thead>
<tr>
<th>Series</th>
<th>Number of elements</th>
<th>Element size</th>
<th>Port size</th>
<th>Maximum flow (Water, at ∆P = 7 kPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FGF□1</td>
<td>1</td>
<td>φ190 x L440</td>
<td>Rc2</td>
<td>Approx. 400 L/min</td>
</tr>
<tr>
<td>FGF□3</td>
<td>3</td>
<td>φ190 x L770</td>
<td>4°JIS10°FF</td>
<td>Approx. 1200 L/min</td>
</tr>
<tr>
<td>FGF□5</td>
<td>5</td>
<td></td>
<td>6°JIS10°FF</td>
<td>Approx. 2000 L/min</td>
</tr>
</tbody>
</table>

**Select from a wide range of filtration accuracy.**

Nominal filtration accuracy 5, 10, 25, 50, 100 µm
Bag filter offers excellent safety performance and ease of maintenance.

- **With safety mechanism**
  Employs SMC proprietary latch mechanism – Prevents cover blowout in cases of erroneous operation.

- **Element can be replaced outside the vessel.**
  Use of a built-in basket mechanism makes it possible to replace the element outside the vessel.

- **Band system**
  Makes the work of tightening easy.
  Compared to a bolt tightening system with many places (between 4 and 6) that need to be tightened, this system is easy to use with only one place to tighten.
  Improved, easier handling thanks to lightweight band
  Easier handling with more lightweight band (Band weight: 1 kg)
  With lock mechanism - Patent pending
  Safe lock mechanism prevents band from coming off even in cases of erroneous operation under internal pressure.

- **No-fluid-buildup structure**
  Basket features hole for fluid release. Release of foreign matter to the outlet side during element replacement is prevented.
  Since there is no leftover fluid, there is no need to perform drainage operations.
  (The drain port of the current model has been eliminated.)

- **Lightweight**
  32% lighter than the current model
  Weight: 13 kg (Current model: 19 kg)
  + Applies to FGF□1A

- **Piping operations are a breeze.**
  With a removable leg system, carrying out piping operations at the fluid release port is easier.

**Example**

1. Remove legs from the main unit.
2. Attach piping to fluid release port.
3. Replace legs on the main unit and attach piping to OUT port.
Variations of Bag Filters

Available combination between an element and a vessel

<table>
<thead>
<tr>
<th>Element</th>
<th>Vessel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard products</td>
<td>FGF1</td>
</tr>
<tr>
<td></td>
<td>FGF3 (Note 2)</td>
</tr>
<tr>
<td></td>
<td>FGF5 (Note 2)</td>
</tr>
<tr>
<td>FGF1</td>
<td>Vessel with one element</td>
</tr>
<tr>
<td>FGF3</td>
<td>Vessel with three elements</td>
</tr>
<tr>
<td>FGF5</td>
<td>Vessel with five elements</td>
</tr>
</tbody>
</table>

Note 1) Combinations between standard or made-to-order elements and standard or made-to-order vessels are marked (●) as above.

Note 2) Please contact SMC for delivery time as the FGF3 and FGF5 are produced upon receipt of order.

Types of Element

<table>
<thead>
<tr>
<th>Standard element</th>
<th>Made-to-Order elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bag element</td>
<td>Sub-element + Standard element</td>
</tr>
<tr>
<td></td>
<td>Effective for extending the service life of a standard element</td>
</tr>
<tr>
<td></td>
<td>X46</td>
</tr>
</tbody>
</table>

Note) Refer to pages 55 to 58 for details on Made-to-Order elements and vessels.
Stable quality and reuse of fluid is possible thanks to filtration!

Contributes to...
- Stable product quality (Fewer defects, etc.)
- Prevention of problems in the line (Prevention of nozzle blockage, etc.)
- Less waste fluid

Application example

Washing line

[Filtration of cleaning fluid]
The filter performs filtration of used cleaning fluid so it can be reused many times. (Thanks to cyclical filtration, the volume of waste fluid is reduced.)

[Filtration of cleaning fluid]
The filter is used to maintain a constant level of cleaning fluid.

Processing line

[Filtration of coolant]
The filter performs filtration of used coolant so it can be reused many times.

Filtration of industrial water

[Filtration of industrial water]
The filter removes foreign matter from raw water so it can be used for manufacturing.

Maintenance example

Two units used side by side
[Reduction in length of time line is stopped for element replacement]
Installing two bag filters means that one filter can always be used while the other is undergoing element replacement, meaning that the line does not have to be stopped for long periods of time for replacement of elements.
### Specifications

**Model**

<table>
<thead>
<tr>
<th>FGF</th>
<th>FGF S</th>
<th>FGF S A</th>
<th>FGF S A 3</th>
<th>FGF S A 40</th>
<th>FGF S A 40 E</th>
<th>FGF S A 40 E 005</th>
<th>FGF S A 40 E 005 B</th>
<th>FGF S A 40 E 005 B G</th>
<th>FGF S A 40 E 005 B G F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating pressure</strong> Max. 0.5 MPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating temperature</strong> Max. 80°C (For with pressure gauge: 60°C or less)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum flow rate</strong> (Note 1) Approx. 400 L/min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **Applicable fluid** Water-soluble coolant, Weak alkali-based cleaning fluid, Industrial water (Vessel material: Stainless steel) Oil-based coolant, Cutting oil (Vessel material: Carbon steel) |

<table>
<thead>
<tr>
<th><strong>Material</strong></th>
<th>Cover</th>
<th>Case</th>
<th>Legs</th>
<th>Seal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common</strong></td>
<td>Stainless steel 304</td>
<td>[FGFS/L] Stainless steel 304 (Note 6)</td>
<td>[FGFC/R] Carbon steel</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Vessel</strong></th>
<th>Port size</th>
<th>Internal volume</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rc2</td>
<td>35 L</td>
<td>156 L</td>
<td>16 kg</td>
</tr>
<tr>
<td>100(4)JIS10°F</td>
<td>35 L</td>
<td>156 L</td>
<td>16 kg</td>
</tr>
<tr>
<td>150(6)JIS10°F</td>
<td>35 L</td>
<td>156 L</td>
<td>16 kg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Element</strong></th>
<th>Material</th>
<th>Nominal filtration accuracy (µm)</th>
<th>Element replacement differential pressure 0.1 MPa (Note 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common</strong></td>
<td>Polyester</td>
<td>5, 10, 25, 50, 100 µm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Number of elements</strong></th>
<th>1 element included</th>
<th>3 elements included</th>
<th>5 elements included</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td>ø190 x L440</td>
<td>ø190 x L770</td>
<td>ø190 x L440</td>
</tr>
</tbody>
</table>

### RoHS

- Made to Order
- RoHS

### Notes

1) Conditions: Fluid = Water, Pressure drop 7 kPa, Nominal filtration accuracy 100 µm
2) Confirm the conformity of the fluid to be used.
3) Surface treatment No. 20® applies to the external surface of the vessel. (Scratches, scrapes, blisters and uneven color may be present as long as they do not interfere with function or performance.)
4) For the FGF S 1 A - 20 - E 005 B - G F series, this indicates cases where the "with pressure gauge" option has been selected.
5) Control the element replacement so that the differential pressure does not exceed 0.1 MPa.
6) Parts other than the wetted parts are made of carbon steel and painted (silver).
7) Please contact SMC for delivery time as the FGF3 1 and FGF5 3 are produced upon receipt of order.
FGF Series
Model Selection

Step 1 Checking operating conditions

- Fluid
- Pressure
- Temperature
- Flow rate
- Filtration accuracy

Confirm that the specifications are within the appropriate range.

- Check the compatibility of fluid with element material [polyester].
  - To check the compatibility with main fluids, refer to "Selection by Main Application" on page 50.

- Check the compatibility of fluid with vessel material [stainless steel 304/ carbon steel].
  - To check the compatibility with main fluids, refer to "Selection by Main Application" on page 50.

- Check the compatibility of fluid with seal material [NBR] or [FKM].
  - To check the compatibility with main fluids, refer to "Selection by Main Application" on page 50.

Confirm that the temperature is 80°C or less.

Confirm that the pressure is 0.5 MPa or less.

Step 2 Selecting a vessel

Step 3 Selecting the filter model

Step 4 Determining the model and number of units

Selection example

Check fluid/pressure/temperature/flow rate/filtration accuracy.

Element material

Compatibility of fluid with polyester

Vessel material

Compatibility of fluid with stainless steel 304/carbon steel

Seal material

Compatibility of fluid with NBR or FKM

Temperature

80°C or less

Pressure

0.5 MPa or less

OK

Consider Made-to-Order products.

Consider special products.

Operating conditions:
- Fluid: Coolant (water-soluble)
  - Viscosity equivalent to water: 1 mm²/sec
  - Pressure: 0.3 MPa
  - Temperature: 50°C
  - Flow rate: 700 L/min
  - Filtration accuracy: 50 µm

Confirm that the specifications are within the appropriate range.

- Coolant (water-soluble)
  - Compatibility with polyester: OK
  - Compatibility with stainless steel 304: OK
  - Compatibility with NBR (FKM): OK
  - 50°C
    - 80°C or less: OK
  - 0.3 MPa
    - 0.5 MPa or less: OK
### Selection method

**Step 2** Selecting a vessel

1. **Calculating the number of elements**
   - Use the flow rate to calculate the number of elements.
   - Required flow rate \( ÷ \) Recommended flow rate = Number of elements

   **[Recommended flow rate per one element]**
   - 400 L/min (Pressure drop 7 kPa to 8 kPa)
   - When viscosity rate is equivalent to water.

   **[Number of elements]**
   - Round up: 1.75 elements \( \approx 2 \) elements
   - For other viscosities, perform viscosity conversion.

2. **Vessel type and number of units**
   - Choose a vessel that satisfies the number of elements obtained in step 1.

### Selection flow chart

**Selecting a vessel**

- Required flow rate \( ÷ \) Recommended flow rate = Number of elements

**[Flow rate] (When viscosity rate is equivalent to water)**

- 400 L/min or less
- 800 L/min or less
- 1200 L/min or less

**[Number of elements]**
- Round up: 1.75 elements \( \approx 2 \) elements

**Choosing the vessel type and number of units**

- 2 elements
  - \( \rightarrow \) FGF1 \(-20\) \(-2\) units

### Selection example

**Calculating the number of elements**

Flow rate: 700 L/min

\[
\frac{700 \text{ L/min}}{400 \text{ L/min}} = 1.75 \approx 2 \text{ elements}
\]

**Vessel and seal material**

Select vessel and seal materials from among those compatible with the fluid used.

**[Compatibility with fluid]**

- Vessel: Stainless steel
- Seal: NBR
- Vessel: Stainless steel
- Seal: FKM

**Selecting the filter model**

1. **Selecting vessel material and seal material**
   - Select vessel and seal materials from among those compatible with the fluid used.

2. **Selecting element size**
   - Select the element size when there is a large amount of contamination or frequent replacements.
   - Element size does not change depending on element size.

3. **Selecting filtration accuracy**
   - Select the required filtration accuracy depending on conditions.
   - Filtration accuracy = Nominal filtration accuracy

**Determining the model and number of units**

Based on the results of Step 2 and Step 3, 2 units of the FGFSTA-20-E050B are selected.
### Selection by Main Application

#### Flow Rate Characteristics (Initial Value)

- **Test fluid:** Water  
  Liquid temperature: 17°C to 20°C (Room temperature)
- **Test method:** Per SMC test method

#### Flow Rate Conversion based on Viscosity Conversion (with viscosity other than that equivalent to water)

1. **Calculation of flow coefficient**
   - Obtain the flow coefficient from the viscosity conversion table.
   - Kinematic viscosity: 20 mm²/sec → Flow coefficient: 95%

2. **Flow rate conversion**
   - Convert the flow rate when viscosity is equivalent to water using the flow coefficient obtained in step 1).  
   - 285 L/min = flow coefficient 95% = 300 L/min
   - 300 L/min flow rate is necessary when viscosity is equivalent to water.
   - After this, make a selection using the selection method.

   *When making a selection, designate the flow rate as 300 L/min when viscosity is equivalent to water.*

- **Reference:** The recommended flow rate for one coolant (oil-based) element at a kinematic viscosity of 20 mm²/sec is the recommended flow rate when viscosity is equivalent to water (400 L/min) x flow coefficient (95%) = recommended flow rate 380 L/min at a kinematic viscosity of 20 mm²/sec.

#### Viscosity Conversion Table

<table>
<thead>
<tr>
<th>Kinematic viscosity (mm²/sec) (cSt)</th>
<th>400</th>
<th>200</th>
<th>100</th>
<th>50</th>
<th>20</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid indicator</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equivalent to honey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paint</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coolant (oil-based)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water, Coolant (water-soluble)</td>
<td>35</td>
<td>58</td>
<td>85</td>
<td>90</td>
<td>95</td>
<td>100</td>
</tr>
</tbody>
</table>

*These relationships between fluids and kinematic viscosity are for guideline purposes only. Check the actual kinematic viscosity of fluid before using. Fluid viscosities shown are at room temperature (17°C to 20°C).*

*Flow coefficient: When 100% of water flows at 1 mm²/sec, the flow coefficient indicates that 85% flows at a kinematic viscosity of 100 mm²/sec.
Bag Filter  **FGF Series**

### Construction

**FGF-1**

- Air release valve
- Pin
- Handle
- Bracket for V-band
- Inlet
- Pressure gauge
- Outlet
- Fluid release

**Component Parts/Replacement Parts**

| No. | Description | Part No. | Material | Qty. | Applicable model
|-----|-------------|----------|---------|------|------------------|
| 1   | Cover       | —        | Stainless steel | 1 | FGF-11
| 2   | Case        | —        | Stainless steel | 1 | FGF-11
| 3   | Basket      | FGF-BT01 | Stainless steel | 1 | FGF-11A
|     |             | FGF-BT02 | Stainless steel | 1 | FGF-11B
| 4   | Element     | EJ501S-□ | Polyester     | 1 | FGF-11A
|     |             | EJ601S-□ | Polyester     | 1 | FGF-11B
| 5   | V-band □    | FGF-BA01 | Stainless steel | 1 | FGF-11
| 6   | Legs (with bolt, nut, flat washer) | FGF-OP01 (Set) | Carbon steel | 1 | FGF-11
| 7   | O-ring      | FGF-KT01 | NBR         | 1 | FGF-11C
|     |             | FGF-KT02 | FKM         | 1 | FGF-11C
| 8   | Holder (with O-ring) | FGF-KT03 (Set) | Polypropylene/ NBR | 1 | FGF-11C
|     |             | FGF-KT04 (Set) | Polypropylene/ FKM | 1 | FGF-11C

Note 1) Refer to “How to Order” on page 47 for the □ part of the model number.

Note 2) When replacing the □ V-band, also replace the □ O-ring at the same time.

### Component Parts and Seal List

| No. | Description | Part No. | Material | Qty. | Applicable model
|-----|-------------|----------|---------|------|------------------|
| 1   | Cover       | —        | Stainless steel | 1 | FGF-31-40
|     |             | —        | Carbon steel | 1 | FGF-51-60
| 2   | Case □      | —        | Stainless steel | 1 | FGF-31A-40
|     |             | —        | Carbon steel | 1 | FGF-51A-60
| 3   | Basket      | BT-3S    | Stainless steel | 3 | FGF-31A-40
|     |             | BT-4S    | Stainless steel | 3 | FGF-51A-60
| 4   | Element     | Refer to “How to Order” on page 47 | Polyester | 3 | FGF-31A-40
|     |             | —        | Carbon steel | 5 | FGF-51A-60
| 5   | Hinge bolt  | —        | Carbon steel | — | —
| 6   | Eyenut      | —        | Carbon steel | — | —
| 7   | Washer      | —        | Carbon steel | — | —
| 8   | Parallel pin| —        | Carbon steel | — | —
| 9   | Lifter      | —        | Carbon steel | — | —
| 10  | Handle      | —        | Carbon steel | — | —

**FGF-3□-40**

- Davit for cover
- Nut
- Spring washer
- Retainer
- Center bolt
- Drain port
- Outlet
- Pressure gauge
- Fluid release
- Air release valve

**FGF-5□-60**

- Leg

### Note

- Refer to “How to Order” on page 47 for the □ part of the model number.

- The leg parts are made of carbon steel.
Options

Companion flange

Flange

Gasket

Hexagon bolt and nut

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Applicable model</th>
<th>Flange dimension</th>
<th>Material</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>T₁</th>
<th>T₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-86S</td>
<td>FGFC3☐-40</td>
<td>10(4D)</td>
<td>Carbon steel</td>
<td>210</td>
<td>175</td>
<td>115.4</td>
<td>19</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>F-87S</td>
<td>FGFC5☐-60</td>
<td>150(6D)</td>
<td>Carbon steel</td>
<td>280</td>
<td>240</td>
<td>166.6</td>
<td>23</td>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>

Note) 2 pieces are required per filter unit. JIS10FF is used for this flange.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Applicable model</th>
<th>Material</th>
<th>E</th>
<th>F</th>
<th>T₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL-79S</td>
<td>FGFC3☐-40</td>
<td>V6500</td>
<td>159</td>
<td>115</td>
<td>3</td>
</tr>
<tr>
<td>AL-80S</td>
<td>FGFC5☐-60</td>
<td>Carbon steel</td>
<td>220</td>
<td>167</td>
<td>3</td>
</tr>
</tbody>
</table>

Note) 2 pieces are required per filter unit.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Applicable model</th>
<th>Flange</th>
<th>Gasket</th>
<th>Hexagon bolt</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-90S</td>
<td>FGFC3☐-40</td>
<td>F-86S</td>
<td>AL-79S</td>
<td>AI-17S</td>
</tr>
<tr>
<td>F-91S</td>
<td>FGFC5☐-60</td>
<td>F-87S</td>
<td>AL-80S</td>
<td>AI-18S</td>
</tr>
<tr>
<td>F-92S</td>
<td>FGFC5☐-60</td>
<td>F-88S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-93S</td>
<td>FGFC5☐-60</td>
<td>F-89S</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Foundation bolt

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Applicable model</th>
<th>Nominal thread size d</th>
<th>d₁</th>
<th>S</th>
<th>L₁</th>
<th>R</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>FGF-OP05</td>
<td>FGG☐☐-20</td>
<td>M16</td>
<td>16</td>
<td>40</td>
<td>71</td>
<td>31.5</td>
<td>400</td>
</tr>
<tr>
<td>AI-3S</td>
<td>FGFC3☐-40</td>
<td>M20</td>
<td>20</td>
<td>50</td>
<td>90</td>
<td>40</td>
<td>500</td>
</tr>
</tbody>
</table>

Note) 3 foundation bolts are required per filter unit. If ordering only foundation bolts, order 3 bolts using the above part number.
## Elements

<table>
<thead>
<tr>
<th>Sub-element + Standard element</th>
<th>Sub-element</th>
<th>HEPO element</th>
<th>Long service life element</th>
</tr>
</thead>
<tbody>
<tr>
<td>X46</td>
<td>X81</td>
<td>X49</td>
<td>X82</td>
</tr>
<tr>
<td>P.55</td>
<td>P.55</td>
<td>P.56</td>
<td>P.56</td>
</tr>
<tr>
<td>Effective for extending the service life of a standard element</td>
<td>Eliminates large foreign matter.</td>
<td>High-performance filtration</td>
<td>Long service life (Four to five times the filtration area compared with the standard elements)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Branch type element</th>
<th>PP (Polypropylene) bag element</th>
<th>Filter paper element</th>
</tr>
</thead>
<tbody>
<tr>
<td>X292</td>
<td>X72</td>
<td>X142</td>
</tr>
<tr>
<td>P.57</td>
<td>P.57</td>
<td>P.58</td>
</tr>
<tr>
<td>More compact vessel is possible. (Filtration area for L440 is same as L770.)</td>
<td>Applicable for strong alkali-based cleaning fluid</td>
<td>Suitable for filtering cutting fluids</td>
</tr>
</tbody>
</table>

## Leg Material: Stainless Steel

| Made to Order FGF Series |
|--------------------------|---|
| X47                      | P.58 |

Leg Material: Stainless Steel
**FGF Series**

**Made to Order**
Please consult with SMC for details.

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### X46  “Sub-element and Standard element” equipped

- Effective for extending the service life of a standard element
- Sub-elements eliminate large foreign matter.

(For coarse filtration)

Sub-element

Standard element

It has a structure such that the spongiform filtration material, which is made of Polyvinylidene Chlorides, is in the form of a bag. It is then fixed by a ring inside the standard element.

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### How to Order

- Refer to “How to Order” on page 47 for standard specifications.

<table>
<thead>
<tr>
<th>1 element included</th>
<th>FGF</th>
<th>FGF</th>
<th>Pressure gauge [Note 1]</th>
</tr>
</thead>
<tbody>
<tr>
<td>FGF * 1 * - 20 - E</td>
<td>B</td>
<td>-</td>
<td>X46</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3/5 elements included</th>
<th>(Produced upon receipt of order.)</th>
<th>FGF</th>
<th>*</th>
<th>-</th>
<th>E</th>
<th>-</th>
<th>X46</th>
</tr>
</thead>
<tbody>
<tr>
<td>FGF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1) Without pressure gauge/Without option: “-” is not required to enter. Example: FGF51A-20-E005B-X46, FGF53B-40-E005X46

---

### Specifications

<table>
<thead>
<tr>
<th>Applicable model</th>
<th>FGF[A]</th>
<th>FGF[B]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main applicable fluid [Note 2]</td>
<td>Coolant (oil-based, water-soluble), Weak alkali-based cleaning fluid, Industrial water</td>
<td></td>
</tr>
<tr>
<td>Nominal filtration accuracy [Note 2]</td>
<td>5, 10, 25, 50, 100 µm (standard element), 500 to 1000 µm (sub-element)</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Max. 80°C</td>
<td></td>
</tr>
<tr>
<td>Maximum flow rate</td>
<td>Max. 400 L/min</td>
<td></td>
</tr>
<tr>
<td>Element replacement differential pressure</td>
<td>Differential pressure 0.1 MPa</td>
<td></td>
</tr>
<tr>
<td>Filtration material</td>
<td>Polyester (standard element), Vinylidene chloride (sub-element)</td>
<td></td>
</tr>
<tr>
<td>Element size</td>
<td>ø190 x L440</td>
<td>ø190 x L770</td>
</tr>
<tr>
<td>Filtration area</td>
<td>1800 cm²</td>
<td>3400 cm²</td>
</tr>
</tbody>
</table>

Note 2) When changing from a standard product to one with X46 specifications, order a sub-element with ring. Since the model number will change when replacement is conducted, we ask that the customer manage the model number. When replacing only the element, order a sub-element (single part) and attach the ring before use.

### X81  Sub-element equipped

- Eliminates large foreign matter (500 µm or larger).

(For coarse filtration)

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### How to Order

- Refer to “How to Order” on page 47 for standard specifications.

<table>
<thead>
<tr>
<th>1 element included</th>
<th>FGF</th>
<th>FGF</th>
<th>Pressure gauge [Note 1]</th>
</tr>
</thead>
<tbody>
<tr>
<td>FGF * 1 * - 20 - B</td>
<td>-</td>
<td>-</td>
<td>X81</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3/5 elements included</th>
<th>(Produced upon receipt of order.)</th>
<th>FGF</th>
<th>*</th>
<th>-</th>
<th>-</th>
<th>X81</th>
</tr>
</thead>
<tbody>
<tr>
<td>FGF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1) Without pressure gauge/Without option: “-” is not required to enter. Example: FGF51A-20-B-X81, FGF53B-40-BX81

---

### Specifications

<table>
<thead>
<tr>
<th>Applicable model</th>
<th>FGF[A]</th>
<th>FGF[B]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main applicable fluid [Note 2]</td>
<td>Coolant (oil-based, water-soluble), Weak alkali-based cleaning fluid, Industrial water</td>
<td></td>
</tr>
<tr>
<td>Nominal filtration accuracy [Note 2]</td>
<td>500 to 1000 µm</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Max. 80°C</td>
<td></td>
</tr>
<tr>
<td>Maximum flow rate</td>
<td>Max. 400 L/min</td>
<td></td>
</tr>
<tr>
<td>Element replacement differential pressure</td>
<td>Differential pressure 0.1 MPa</td>
<td></td>
</tr>
<tr>
<td>Filtration material</td>
<td>Vinylidene chloride</td>
<td></td>
</tr>
<tr>
<td>Element size</td>
<td>ø190 x L440</td>
<td>ø190 x L770</td>
</tr>
<tr>
<td>Filtration area</td>
<td>1800 cm²</td>
<td>3400 cm²</td>
</tr>
</tbody>
</table>

Note 2) When changing from a standard product to one with X81 specifications, order a sub-element with ring inside the standard element. (Refer to page 47.)
FGF Series

X49 HEPO element equipped

- High-performance filtration
- Optimum for filtration of precision machine fluids, precision cleaning fluids, etc.
- Effective for the grinding powders

A cylindrical element in which the filter material made of P.G.P. (Polyester + Glass fiber) is sandwiched by a stainless steel mesh and pleated.

Note 4) Fluids that cause corrosion, deterioration or expansion of the material used in the elements cannot be used.

Note 5) Specialized for precision filtration. The filtration accuracy indicates 98% of filtered particle size.

Note 6) Conditions: Fluid = Water. For other fluids, maximum flow rate is per one element. When there are three elements or five elements, multiply by 3 or 5.

How to Order

Refer to “How to Order” on page 47 for standard specifications.

1 element included
FGF  1  20 - Z 003 B - X49

3/5 elements included
(Produced upon receipt of order.)
FGF  1  20 - Z 003  X49

Element/Element-Fixing Component Part No. (Note 2)

<table>
<thead>
<tr>
<th>Element size</th>
<th>HEPO element (single part)</th>
<th>Element-fixing component</th>
</tr>
</thead>
<tbody>
<tr>
<td>L440</td>
<td>EZFN20AS</td>
<td>FGF-OP03</td>
</tr>
<tr>
<td>L770</td>
<td>EZFN30AS</td>
<td>FGF-OP013</td>
</tr>
</tbody>
</table>

Note 2) When changing from a standard product to one with X49 specifications, additionally order a HEPO element (single part) and an element-fixing component. Since the model number will change when replacement is conducted, we ask that the customer manage the model number.

Note 3) 1 set is required per element.

Ex.) When using 3 elements, order 3 sets.

Example) FGFS1A-20-Z003B-X49, FGFS3B-40-Z003X49

Specifications

<table>
<thead>
<tr>
<th>Applicable model</th>
<th>FGF-A</th>
<th>FGF-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal filtration accuracy Note 5</td>
<td>0.5 µm</td>
<td>50 µm</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Max. 80°C</td>
<td>Max. 80°C</td>
</tr>
<tr>
<td>Maximum flow rate Note 6</td>
<td>Max. 100 L/min</td>
<td>Max. 200 L/min</td>
</tr>
<tr>
<td>Element replacement differential pressure</td>
<td>Differential pressure 0.1 MPa</td>
<td></td>
</tr>
<tr>
<td>Filtration material</td>
<td>Polyester/Glass fiber</td>
<td></td>
</tr>
<tr>
<td>Element size</td>
<td>ø186 x L312</td>
<td>ø186 x L642</td>
</tr>
<tr>
<td>Filtration area</td>
<td>16500 cm²</td>
<td>31600 cm²</td>
</tr>
</tbody>
</table>

X82 Long service life element equipped

- Four to five times the filtration area (compared with the standard elements)
- Reduction in number of element replacements

A cylindrical element in which the non-woven material made of PP (Polypropylene) is sandwiched by a PET (Polyester) mesh and pleated.

Note 4) Fluids that cause corrosion, deterioration or expansion of the material used in the elements cannot be used.

Note 5) The filtration accuracy is based on SMC criteria, and differs from the absolute filtration accuracy (filtration efficiency of 97% or more).

Note 6) Conditions: Fluid = Water. For other fluids, maximum flow rate is per one element. When there are three elements or five elements, multiply by 3 or 5.

How to Order

Refer to “How to Order” on page 47 for standard specifications.

1 element included
FGF  1  20 - Z 050 B - X82

3/5 elements included
(Produced upon receipt of order.)
FGF  1  20 - Z 050  X82

Element/Element-Fixing Component Part No. (Note 2)

<table>
<thead>
<tr>
<th>Element size</th>
<th>Long service life element (single part)</th>
<th>Element-fixing component</th>
</tr>
</thead>
<tbody>
<tr>
<td>L440</td>
<td>EZDN10AS-050</td>
<td>FGF-OP03</td>
</tr>
<tr>
<td>L770</td>
<td>EZFN30AS-050</td>
<td>FGF-OP013</td>
</tr>
</tbody>
</table>

Note 2) When changing from a standard product to one with X82 specifications, additionally order a long service life element (single part) and an element-fixing component. Since the model number will change when replacement is conducted, we ask that the customer manage the model number.

Note 3) 1 set is required per element.

Ex.) When using 3 elements, order 3 sets.

Example) FGFS1A-20-Z050B-X82, FGFS3B-40-Z050X82

Specifications

<table>
<thead>
<tr>
<th>Applicable model</th>
<th>FGF-A</th>
<th>FGF-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal filtration accuracy Note 5</td>
<td>0.5 µm</td>
<td>50 µm</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Max. 80°C</td>
<td>Max. 80°C</td>
</tr>
<tr>
<td>Maximum flow rate Note 6</td>
<td>Max. 100 L/min</td>
<td>Max. 200 L/min</td>
</tr>
<tr>
<td>Element replacement differential pressure</td>
<td>Differential pressure 0.1 MPa</td>
<td></td>
</tr>
<tr>
<td>Filtration material</td>
<td>Polyester/Polyester</td>
<td></td>
</tr>
<tr>
<td>Element size</td>
<td>ø186 x L312</td>
<td>ø186 x L642</td>
</tr>
<tr>
<td>Filtration area</td>
<td>9400 cm²</td>
<td>12400 cm²</td>
</tr>
</tbody>
</table>
**X292** Branch type element equipped

- 1.8 times the filtration area (compared with the standard element)
- Filtration area is the same for short size elements (L440) and long size (L770). More compact vessels are possible.

(For coarse filtration)

Two-bag construction made of polyester non-woven material.

**How to Order**

Refer to “How to Order” on page 47 for standard specifications.

![Image](image)

**Element Part No.** (Note 2)

<table>
<thead>
<tr>
<th>Element size</th>
<th>PP (Polypropylene) bag element (single part)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L440</td>
<td>EJ501S-X30 (Note 3)</td>
</tr>
<tr>
<td>L770</td>
<td>EJ601S-X30 (Note 3)</td>
</tr>
</tbody>
</table>

(For other conditions, refer to “Flow Rate Characteristics” on page 50. Equivalent to standard element)

**Specifications**

- Main applicable fluid: Coolant (oil-based, water-soluble), Weak alkali-based cleaning fluid, Industrial water
- Nominal fluid accuracy: 1, 3, 5 µm
- Operating temperature: Max. 80°C
- Maximum flow rate: Max. 400 L/min
- Element replacement differential pressure: Differential pressure 0.1 MPa
- Filtration material: Polyester
- Element size: ø190 x L440
- Filtration area: 3300 cm²

X72 PP (Polypropylene) bag element equipped

- Polypropylene filter material can be used with a wide variety of fluids.
- Applicable for strong alkali-based cleaning fluid

(For coarse filtration)

**How to Order**

Refer to “How to Order” on page 47 for standard specifications.

![Image](image)

**Element Part No.** (Note 2)

<table>
<thead>
<tr>
<th>Element size</th>
<th>PP (Polypropylene) bag element (single part)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L440</td>
<td>EJ501S-X30 (Note 3)</td>
</tr>
<tr>
<td>L770</td>
<td>EJ601S-X30 (Note 3)</td>
</tr>
</tbody>
</table>

(For other conditions, refer to “Flow Rate Characteristics” on page 50. Equivalent to standard element)

**Specifications**

- Main applicable fluid: Coolant (oil-based, water-soluble), Weak alkali-based cleaning fluid, Industrial water
- Nominal fluid accuracy: 1, 3, 5 µm
- Operating temperature: Max. 80°C
- Maximum flow rate: Max. 400 L/min
- Element replacement differential pressure: Differential pressure 0.1 MPa
- Filtration material: Polyester
- Element size: ø190 x L440
- Filtration area: 3300 cm²

Note:

- Fluids that cause corrosion, deterioration or expansion of the material used in the elements cannot be used.
- Three or five elements included.
**FGF Series**

### X142 Filter paper element equipped

- Optimum for filtration of cutting or grinding oil
- Large filtration area makes it suitable for filtering fluids containing highly dense contaminants.

(For coarse filtration)

A cylindrical element with a cotton-made filter inside and a pleated material on the outside for reinforcement.

Note 4) Fluids that cause corrosion, deterioration or expansion of the material used in this filter and elements cannot be used.

Note 6) Conditions: When fluid has a kinematic viscosity of 36 mm²/sec (equivalent to turbine oil VG36).

### How to Order

- Refer to “How to Order” on page 47 for standard specifications.

<table>
<thead>
<tr>
<th>1 element included</th>
<th>FGF</th>
<th>1</th>
<th>–</th>
<th>20</th>
<th>–</th>
<th>Z</th>
<th>010</th>
<th>B</th>
<th>–</th>
<th>–</th>
<th>X142</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/5 elements included</td>
<td>FGF</td>
<td>–</td>
<td>–</td>
<td>Z</td>
<td>010</td>
<td>–</td>
<td>X142</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1) Without pressure gauge/Without option: “–” is not required to enter.

Example) FGF1A-20-Z010B-X142, FGF3B-40-Z010X142

### Specifications

<table>
<thead>
<tr>
<th>Applicable model</th>
<th>FGF</th>
<th>1</th>
<th>A</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main applicable fluid</td>
<td>Coolant (oil-based), Lubricating oil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal filtration accuracy</td>
<td>10 μm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Max. 80°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum flow rate</td>
<td>Max. 100 L/min</td>
<td>Max. 200 L/min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Element replacement differential pressure</td>
<td>Differential pressure 0.1 MPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filtration material</td>
<td>Cotton</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Element size</td>
<td>ø186 x L312</td>
<td>ø186 x L642</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filtration area</td>
<td>8900 cm²</td>
<td>18500 cm²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### X47 Leg material: Stainless steel

- Legs made of stainless steel can be used.

### How to Order

- Refer to “How to Order” on page 47 for standard specifications.

**Example)** FGF1A-20-E005B-X47

### Specifications

<table>
<thead>
<tr>
<th>Applicable model</th>
<th>FGF</th>
<th>1</th>
<th>A</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Stainless steel 304</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cover</td>
<td>Stainless steel 304</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case</td>
<td>Stainless steel 304</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legs</td>
<td>Stainless steel 304</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating pressure</td>
<td>Max. 0.5 MPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Max. 80°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum flow rate</td>
<td>Max. 400 L/min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main applicable fluid</td>
<td>Coolant (oil-based, water-soluble), Weak alkaline-based cleaning fluid, Industrial water</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Element</td>
<td>Filtration area</td>
<td>ø190 x L640</td>
<td>ø190 x L770</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of elements</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Element size</td>
<td>1800 cm²</td>
<td>3400 cm²</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 2) When changing from a standard product to one with X47 specifications, order the part numbers above and replace only the legs.

Since the model number will change when replacement is conducted, we ask that the customer manage the model number.

Note 4) Fluids that cause corrosion, deterioration or expansion of the material used in this filter and elements cannot be used.

Note 5) Depends on the filtration accuracy (nominal filtration accuracy) of the element.
FGF Series
Specific Product Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and the Operation Manual for details. Please download the Operation Manual via SMC website, http://www.smcworld.com

Model Selection/Design

Do not select a model exceeding specification ranges and carefully consider the purpose of use, required specifications and operating conditions such as fluid, pressure, flow rate, temperature and environment. Mishandling may lead to an unexpected accident.

⚠️ Warning

1. Operating pressure
Do not use the product beyond the operating pressure range. Do not use in locations where peak pressure exceeds the operating pressure due to water hammer, surge pressure, etc.

2. Operating temperature
Do not use the product beyond the operating temperature range. Do not use at temperatures at or above the boiling point of the fluid.

3. Fluid
- Use the product for filtering coolant (oil-based or water-soluble), weak alkali-based cleaning fluid or industrial water.
- Never use the product with gases.
- Do not use the product with corrosive fluids.
- Do not use the product with fluids which will likely cause the expansion and deterioration of seals, O-rings or the element. Some fluids can deteriorate a seal or an O-ring, and have an affect on the filter function, causing leakage.
- The wetted parts of the pressure gauge is made of brass. Check the compatibility with fluid in use.

4. Operating environment
- Do not use in operating conditions or environments where changes in color or deterioration of material due to corrosion occur.
- Do not use this product in a place where shock or vibrations occur.

⚠️ Caution

1. Pressure drop (ΔP)
- Use the product with a flow which has an initial pressure drop which will become 10 kPa or less.
- The pressure drop fluctuates depending on operating conditions. Since the pressure drop is one of the factors indicating filter characteristics, use the filter by setting a controlling standard.

2. Installation space
Arrange the necessary space for inspection, before installing and piping the product.

[Maintenance work space]
- Above vessel (for removal of basket during element replacement) \( \geq 450 \) mm above vessel
- Around band (for removal of band during element replacement) \( \geq 50 \) mm around band
- Applies to FGF SERIES

Installation and Piping

⚠️ Caution

1. Use the product with a circuit having lesser fluctuation to the filter caused by pressure or flow. (Refer to Fig. 1.)

Fig. 1 Example of cyclical filtration circuit

2. Use the product in a circuit where no backflow occurs in the filter. If any backflow occurs, take appropriate measures, such as installation of a non-return valve. The riser piping at the outlet of the filter may also cause backflow. So, take appropriate measures shown above.

3. Firmly fix the bottom to the ground using foundation bolts, etc.

4. Connect the valves or fittings suited to the operating conditions by checking the size of each connection port.

5. Prior to starting the pump, flush the piping line and check for internal powder from the piping screws or gasket holder assembly or other seals.

6. During element replacement, in order for firm

Operation

⚠️ Caution

1. Releasing the air
When applying pressure for starting a pump, etc., be sure to release the air by opening the air release valve on the top. (Refer to Fig. 3.)

2. When operating
When applying pressure for starting a pump, etc., confirm that each connecting parts are completely sealed. If any abnormality is found, such as fluid leakage, stop the product immediately and locate the possible cause of the failure. Resume operation after taking appropriate measures to stop the fluid leakage by replacing the O-rings or additionally tightening the fittings, etc.

Maintenance

⚠️ Caution

1. Timing of element replacement
When the time has come to replace the element, replace it with a new element immediately.

- Timing of element replacement =
- When pressure drop has reached to 0.1 MPa.

2. Element replacement work
- Carry out element replacement work based on the procedure in the operation manual.
- Mishandling could lead to malfunction or damage the machinery and equipment.
- Replace the elements only after confirming that the pressure is zero.
- The parts used for tightening the cover (V-band, etc.) must be properly positioned after replacing elements.

3. Cleaning each component
During element replacement, in order for firm sealing to take place, clean the sealing surface of the seal and/or remove the paint which is left on the tightened parts of the cover or the thread parts.

4. Replacing seals
Replace the deteriorated or expanded O-ring, gasket holder assembly or other seals.

- Also, replace the seal after it has been used for one year or when fluid leakage occurs.

5. Parts used for tightening the cover
If a part used for tightening the cover (V-band, etc.) is deformed or the threads are galled, it must be replaced.

6. Temperature
When operating at high temperatures (40°C to 80°C), there is danger of burns, etc.

- Confirm that the surface temperature of the filter or the parts for operation (V-band, element, etc.) are 40°C or less, to prevent a burn from occurring.