Aplications

The KRF backflush filter is a versatile self-cleaning filter for water and conditioned process water. Filtration rates of up to 25 µm are possible with this filter type.

Characteristics

- Continuous flow without process interruption
- Low flush volumes in the cleaning process
- Filter fineness from 25 µm to 2 mm.

Approvals

3.1. Certificate, DGRL/TÜV, GL, LS, DNV, ABS, TR TF/TR CU Certificates (EAC), ASME U-Stamp, Lloyd's Register Type Approval Certificate No. 16/20086

conformity evaluation according 2014/68/EU and marking according the directive.
Brief description and operation

The filter consists of an vessel with three different chambers. There is a coarse screen that is used as a prefilter in the first prefiltration chamber with the water inlet. The operating pressure at the filter outlet has to be at least 2–3 bar.

The water flows from the outside to the inside of prefilter. Once, the water gets inside the filter, it goes into the second chamber that is called “filtration chamber”. In this chamber is the filtering element: the FILTER INSERT.

The medium flows through the filter insert from the inside to the outside. The dirt particles remain inside and settle on the surface whereby a pressure loss occurs. The electronic control monitors the differential pressure applied to the strainer by differential pressure switch. If the preset standard differential pressure of 0.3 bar (0.1–0.7 bar setting possible depending on the design and application) is reached, the cleaning function is triggered. In addition the cleaning function can be triggered by a timer or manually by pressing a button, depending on the operating conditions (as optional). The filter backwashing bases on a third chamber, the backwashing chamber, whose outlet is connected to the drainage valve that allows water evacuation when the backwashing process starts. The backwashing chamber is separated from the filtration chamber by a special sealing.

The SUCTION SCANNER is at the same place as the filtering cartridge central shaft and it is hydraulically connected to the backwashing chamber. The SUCTION NOZZLES are installed in the filtration chamber. The nylon brushes nearly reach the screen. The position of these nozzles in the suction scanner has been studied for getting into contact with the screen internal surface, thanks to the spiral movement that the electric motor provides to the scanner: when combining a longitudinal and rotation movement.

Notice:
The compatibility between medium and vessel or sealing material is the responsibility of the operator.
The design of the pressure vessel is based on a quasi-static operation (load cycle number ≤1000 according to AD 2000 Merkblatt S1, section 1.4). Max. Differential pressure inlet - outlet 1 bar.

* Options differ from model to model (KRF with pre filter chamber). KRF-RL and KRF-C without chamber.
Functional description of the cleaning process

- Water gets into the filter through the prefiltration chamber, where bigger particles are retained.
- Water gets into the filtering chamber, goes through from inside to outside the FILTER INSERT.
- The dirt particles remain on the screen interior what produces head loss between the filter inlet and outlet gradually. Two analogic measuring transducers will indicate the backwashing sequence when the DP becomes 0.3 bar. There are other possibilities to start backwashing: Backwashing by time, time and pressure combination, continuous backwashing option, or by pressing a button.
- When the pressure switch indicates 0.3 bar, the drain valve receives the opening signal. Then it generates a pressure difference between outside (atmospheric pressure) and the inside of the filter (working pressure). That is the reason why the water flows through the strainer insert to the flushing outlet. Besides this, the starting signal is also sent to the motor.

- The result of these actions: the suction effect of the nozzles on the dirt particles sticking to the filter insert and the suction scanner spiral movement in the inside of the filter. The necessary working pressure at filter outlet is minimum 2–3 bar. For fine filtering below 100 micron and depending on water quality the necessary working pressure shall be over 3.0 bar. Higher working pressure is positive for the cleaning effect.
- During the backwashing process that lasts 25 seconds for most models, water is still being filtered and flows to the system or application. This fact allows that the backwashing water consumption is MINIMUM and the working system is CONTINUOUS.
- After the set flushing period elapses the backflushing outlet valve closes automatically and the cleaning cycle ends.

1. Dirt water inlet
2. Dirt water prefiltration (coarse particles)
3. Dirt side
4. Cleaned side
5. Filtered water outlet
6. Flush outlet
Head loss graph

**KRF 50 µm**

- Pressure [bar] vs. Flow [m³/h]
- Lines represent different filter grades: KRF GR 3, KRF GR 4, KRF GR 6, KRF GR 8, KRF GR 10, KRF GR 12, KRF GR 14

**KRF 80 µm**

- Pressure [bar] vs. Flow [m³/h]
- Lines represent different filter grades: KRF GR 3, KRF GR 4, KRF GR 6, KRF GR 8, KRF GR 10, KRF GR 12, KRF GR 14
Head loss graph

KRF 125 µm

KRF 1.500 µm
## Technical data and dimensions

### KRF

### Model Nom. diameter Flange connection

<table>
<thead>
<tr>
<th>Model</th>
<th>Nom. diameter</th>
<th>Flange connection</th>
<th>DN mm</th>
<th>A mm</th>
<th>B mm</th>
<th>C mm</th>
<th>D mm</th>
<th>E mm</th>
<th>F mm</th>
<th>G mm</th>
<th>H mm</th>
<th>Filter surface area cm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>KRF GR 3</td>
<td>80</td>
<td>302</td>
<td>360</td>
<td>219</td>
<td>1.625</td>
<td>881</td>
<td>457</td>
<td>325</td>
<td>400</td>
<td>2.657</td>
<td></td>
<td></td>
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<tr>
<td>KRF GR 4</td>
<td>80, 100</td>
<td>315</td>
<td>770</td>
<td>220</td>
<td>2.140</td>
<td>1.305</td>
<td>457</td>
<td>325</td>
<td>690</td>
<td>5.383</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KRF GR 6</td>
<td>80, 100, 150</td>
<td>340</td>
<td>1.000</td>
<td>240</td>
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<td>1.580</td>
<td>457</td>
<td>325</td>
<td>970</td>
<td>7.997</td>
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<td></td>
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<tr>
<td>KRF GR 8</td>
<td>100, 150, 200</td>
<td>367</td>
<td>1.100</td>
<td>388</td>
<td>2.690</td>
<td>1.855</td>
<td>457</td>
<td>325</td>
<td>1.240</td>
<td>10.608</td>
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<tr>
<td>KRF GR 10</td>
<td>150, 200, 250</td>
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<td>1.370</td>
<td>314</td>
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<td>325</td>
<td>1.520</td>
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<tr>
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<td>200, 250, 300</td>
<td>430</td>
<td>1.100</td>
<td>325</td>
<td>2.707</td>
<td>1.855</td>
<td>660</td>
<td>450</td>
<td>1.240</td>
<td>16.509</td>
<td></td>
<td></td>
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<tr>
<td>KRF GR 14</td>
<td>250, 300, 350</td>
<td>433</td>
<td>1.370</td>
<td>327</td>
<td>2.982</td>
<td>2.130</td>
<td>660</td>
<td>450</td>
<td>1.520</td>
<td>21.304</td>
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</tr>
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</table>

### Flushing volume/backflush

<table>
<thead>
<tr>
<th>Model</th>
<th>Flushing volume/backflush</th>
<th>Weight kg</th>
<th>Max. flow rate m³/h</th>
<th>High quality water Flow rate m³/h</th>
<th>Medium quality water Flow rate m³/h</th>
<th>Low quality water Flow rate m³/h</th>
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<tbody>
<tr>
<td>KRF GR 3</td>
<td>80</td>
<td>35</td>
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<td>KRF GR 4</td>
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<td>KRF GR 6</td>
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<td>105</td>
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<td>500</td>
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<tr>
<td>KRF GR 8</td>
<td>100, 150, 200</td>
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<td>KRF GR 14</td>
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<td>900</td>
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* Flow rates are based on 100/125 micron and depend on water quality and filter mesh. So the actual allowed flow may vary. Contact Krone for exact dimensioning.
Technical data and dimensions

KRF-C

For low flow rates

<table>
<thead>
<tr>
<th>Model</th>
<th>Nom. diameter</th>
<th>Flange connection</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Filter surface area</th>
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<tbody>
<tr>
<td></td>
<td>DN mm</td>
<td></td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
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<td>cm²</td>
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<tr>
<td>KRF-C GR 2</td>
<td>50</td>
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<td>220</td>
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<td>980</td>
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<td>590</td>
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<td>1.340</td>
<td>2.655</td>
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<tr>
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<td>470</td>
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<td>1.615</td>
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<table>
<thead>
<tr>
<th>Model</th>
<th>Nom. diameter</th>
<th>Flange connection</th>
<th>Flushing volume/backflush</th>
<th>Weight</th>
<th>Max. flow rate</th>
<th>High quality water</th>
<th>Medium quality water</th>
<th>Low quality water</th>
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<td></td>
<td>DN mm</td>
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<td>kg</td>
<td>Flow rate m³/h*</td>
<td>Flow rate m³/h*</td>
<td>Flow rate m³/h*</td>
<td>Flow rate m³/h*</td>
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<td>8</td>
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<td>KRF-C GR 3</td>
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<td>53</td>
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<td>120</td>
<td>100</td>
<td>60</td>
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* Flow rates are based on 100/125 micron and depend on water quality and filter mesh. So the actual allowed flow may vary. Contact Krone for exact dimensioning.
# Technical data and dimensions

**KRF-RL**

For corrosive media

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<thead>
<tr>
<th>Model</th>
<th>Nom. diameter</th>
<th>Flange connection</th>
<th>A</th>
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<th>C</th>
<th>D</th>
<th>E</th>
<th>Filter surface area</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>DN mm</td>
<td></td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
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<td>cm²</td>
</tr>
<tr>
<td>KRF-RL 6</td>
<td>150</td>
<td></td>
<td>350</td>
<td>600</td>
<td>824</td>
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<td>2.700</td>
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<tr>
<td>KRF-RL 8</td>
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<td>350</td>
<td>900</td>
<td>824</td>
<td>2.320</td>
<td>2.975</td>
<td>10.600</td>
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<tr>
<td>KRF-RL 10</td>
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<td>900</td>
<td>824</td>
<td>2.600</td>
<td>3.300</td>
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<tr>
<td>KRF-RL 12</td>
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<td>400</td>
<td>900</td>
<td>1.025</td>
<td>2.320</td>
<td>2.975</td>
<td>16.500</td>
</tr>
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<td>KRF-RL 14</td>
<td>350</td>
<td></td>
<td>400</td>
<td>900</td>
<td>1.025</td>
<td>2.600</td>
<td>3.300</td>
<td>21.300</td>
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<table>
<thead>
<tr>
<th>Model</th>
<th>Nom. diameter</th>
<th>Flushing volume/backflush</th>
<th>Weight kg</th>
<th>Max. flow rate m³/h*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DN L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KRF-RL 6</td>
<td>150</td>
<td>105</td>
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<td>KRF-RL 8</td>
<td>200</td>
<td>140</td>
<td>365</td>
<td>700</td>
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<tr>
<td>KRF-RL 10</td>
<td>250</td>
<td>175</td>
<td>405</td>
<td>1.150</td>
</tr>
<tr>
<td>KRF-RL 12</td>
<td>300</td>
<td>140</td>
<td>550</td>
<td>1.400</td>
</tr>
<tr>
<td>KRF-RL 14</td>
<td>350</td>
<td>175</td>
<td>610</td>
<td>1.800</td>
</tr>
</tbody>
</table>

* Flow rates are based on 100/125 micron and depend on water quality and filter mesh. So the actual allowed flow may vary. Contact Krone for exact dimensioning.
## Technical data

<table>
<thead>
<tr>
<th>Technical data</th>
<th>Standard version</th>
<th>Special version or optional extras equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter insert/filtration degree</td>
<td>Filter insert 25 µm–2 mm</td>
<td></td>
</tr>
<tr>
<td>Filter cover</td>
<td>Cover with bolts and nuts</td>
<td></td>
</tr>
<tr>
<td>Venting device</td>
<td>Plug</td>
<td>Ball valve</td>
</tr>
<tr>
<td>Drain device</td>
<td>Plug</td>
<td>Ball valve</td>
</tr>
<tr>
<td>Connections</td>
<td>Flange in accordance with DIN 2632/Form C PN 10</td>
<td>As specified by customer (e.g. ANSI, JIS)</td>
</tr>
<tr>
<td>Materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>CS carbon steel (Epoxy + Polyester)</td>
<td>SS304, SS316/SS316Ti, H II steel, CrNi, 1.0425</td>
</tr>
<tr>
<td>Seals</td>
<td>NBR</td>
<td>PTFE/FPM, other</td>
</tr>
<tr>
<td>Perforated plate/mesh/cleaning nozzle</td>
<td>SS304/PVC</td>
<td>SS316L/POM</td>
</tr>
<tr>
<td>Drain valve</td>
<td>Brass/SS/PA</td>
<td>St, Ms, SS304, SS316, Rg 5</td>
</tr>
<tr>
<td>Version</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric gear motor</td>
<td>3 x 400 V/50 Hz, protection class IP 65</td>
<td>As specified by customer</td>
</tr>
<tr>
<td>Control</td>
<td>Not mounted to filter</td>
<td></td>
</tr>
<tr>
<td></td>
<td>With transformer 500 V/400 V/230 V – 50 Hz/60 Hz, protection class IP 65, programmable</td>
<td>Mounted on the filter as specified by the customer</td>
</tr>
<tr>
<td>Flush outlet valve</td>
<td>2” hydraulic operated valve</td>
<td>Electro-pneumatic (230 V, 6 bar)/(24 V, 6 bar) protection class IP 65</td>
</tr>
</tbody>
</table>

### Materials

- **ASTM**
- **Housing**
  - CS carbon steel (Epoxy + Polyester)
  - SS304, SS316/SS316Ti, H II steel, CrNi, 1.0425
- **Seals**
  - NBR
  - PTFE/FPM, other
- **Perforated plate/mesh/cleaning nozzle**
  - SS304/PVC
  - SS316L/POM
- **Drain valve**
  - Brass/SS/PA
  - St, Ms, SS304, SS316, Rg 5

### Surface treatment

- **Steel housing**
  - Interior: Epoxy + Polyester
  - Exterior: Epoxy
- **Stainless steel**
  - Glass bead blasted, pickled and passivated

### Accessories

We produce and deliver additional design and material variants on request.
We solicit your request.
Overview of our Filter Types

**Self cleaning filter**
- KAF® Self cleaning Bernoulli®-filter
- KAF-G
- KAF-S
- KRF Backflush-filter
- KAS Scraper filter

**Single filter**
- KSF® Single basket filter (flanged)
- KMF Threaded basket filter
- KWF Welded/custom made basket filter
- KWF-Inline Inlet flange and outlet flange inline

**Duplex filter**
- KDF-K Duplex filter
- KDF-V Valve switch duplex filter
- KDF-VB Butterfly valve switch filter
- KDF-W Duplex filter

**Other filter solutions**
- KBF Bag filter
- KBF-M Multi-Bag filter
- KOW Oil and water separator
- KCS Centrifugal separator

**Accessoires**
- DeltaP Differential pressure indicator
- Contaminant level indicator
- Filterbags
- Magnets

**Filter elements**
- Basket elements
- Ring elements
- Star-pleated elements
- Wedge wire elements
- Custom-made elements
Overview of our Filter Types

- Self cleaning filter
- Single filter
- Duplex filter
- Other filter solutions

Accessories

- Filter elements
- Ring elements
- Star-pleated elements
- Wedge wire elements
- Custom-made elements

www.krone-filter.com
Type Approval Certificate

This is to certify that the undersigned product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd’s Register Type Approval System.

This certificate is issued to:

PRODUCER: Krone Filter Solutions GmbH
Industriestrasse 19
28876 Oyten
Germany

DESCRIPTION: Single, duplex and self-cleaning automatic filter with several housing sizes and combinations made from standard materials spheroidal iron castings EN-GJS-500-7 (GGG 50)* or EN-GJS-400-15 (GGG 40), carbon steel optional rubber lined or stainless steel.

TYPES: KSF, KMF, KDF-K, KDF-V, KAF, KRF

APPLICATION: Filter depending on type for diesel oil, oil or water piping systems in ship and offshore installations classed or intended for Classification with Lloyd’s Register.

RATINGS:

<table>
<thead>
<tr>
<th>Filter type</th>
<th>Nominal pressures: [bar]</th>
<th>Size range:</th>
<th>Material:</th>
</tr>
</thead>
<tbody>
<tr>
<td>KSF</td>
<td>6, 10, 25</td>
<td>DN 15 – DN 600</td>
<td>Spheroidal iron casting</td>
</tr>
<tr>
<td>KMF</td>
<td>6, 10, 25</td>
<td>G ½” – 2 ½”</td>
<td>Spheroidal iron casting</td>
</tr>
<tr>
<td>KDF-K</td>
<td>6, 10, 25</td>
<td>DN 15 – DN 200</td>
<td>Spheroidal iron casting</td>
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<td>KDF-V</td>
<td>6, 10, 25</td>
<td>DN 100 – DN 600</td>
<td>Spheroidal iron casting, carbon steel</td>
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<td>KRF</td>
<td>6, 10</td>
<td>DN 32 – DN 400</td>
<td>Spheroidal iron casting, carbon steel</td>
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<td>KAF</td>
<td>6, 10</td>
<td>DN 50 – DN 1000</td>
<td>Spheroidal iron casting, carbon or stainless steel</td>
</tr>
</tbody>
</table>

Certificate No. 16 / 20086

Issue Date 09 September 2016

Expiry Date 08 September 2021

Sheet 1 of 3

Torsten Schröder
Hamburg Technical Support Office
Lloyd’s Register EMEA

Lloyd’s Register EMEA
71 Fenchurch Street, London EC3M 4BS

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### RATINGS, cont.

<table>
<thead>
<tr>
<th>Material</th>
<th>Temperature range:</th>
<th>For fluids**:</th>
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<tbody>
<tr>
<td>Spheroidal cast iron</td>
<td>-10 up to +300°C</td>
<td>MDO, oil, water, seawater</td>
</tr>
<tr>
<td>Austenitic stainless steel:</td>
<td>-196 up to +300°C</td>
<td>MDO, oil, nitrogen</td>
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<td>SA240-304L, SA240-316Ti,</td>
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</tr>
<tr>
<td>SA240-321, SA240-316L,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA240-904L,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duplex stainless steel:</td>
<td>40 up to +250°C</td>
<td>seawater</td>
</tr>
<tr>
<td>1.4462, 1.4463, UNS S31803</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Super duplex: 1.4410,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNS 32750</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbon steel: St 50, P235GH,</td>
<td>40 up to +100°C</td>
<td>MDO, oil, water, seawater</td>
</tr>
<tr>
<td>P245GH, P250GH, P265GH,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA516 Gr60, SA516 Gr70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**) including fluids and mixture of similar evaluation class
Pressure reductions at elevated temperatures are to be considered.

**Media depending on type:** KAF, KRF: water, seawater
KSF, KMF, KDF-K and KDF-V: MDO, oil, nitrogen, water, seawater

### OTHER CONDITIONS
The manufacturer’s installation instructions are to be sought.
*) Not to be used for applications with expected significant chock or vibration loads.

### STANDARD
Lloyd’s Register Rules and Regulations for the Classification of Ships, July 2016
The Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.

If the specified standards are amended during the validity of this certificate, the product is to be re-approved prior to it being supplied to vessels to which the amended standards apply.

The Design Appraisal Document No. HTS/ENS 34963-16 and its supplementary Type Approval Terms and Conditions form part of this Certificate.
THE LLOYD’S REGISTER’S TYPE APPROVAL SYSTEM, 2014
ISSUED TO: KRONE FILTER SOLUTIONS GMBH
FOR: SINGLE, DUPLEX AND AUTOMATIC FILTER
TYPES: KSF, KMF, KDF-K, KDF-V, KAF, KRF
TYPE APPROVAL CERTIFICATE NO. 16/20086

The undernoted documents have been reviewed for compliance with the requirements of the Lloyd’s Register’s Type Approval System Procedure TA14 and this Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

- Application Form to LR Type Approval 26.11.2014
- Product Catalogue / general Data sheets 2014
  for types KSF, KMF, KDFK, KDFV, KDF and KRF
  KSF
  KSF000.03.05.16.00.01, Rev 0 22.11.2013
  KSF000.03.05.16.01.01, Rev 1 22.11.2013
  KMF LR Data sheet, Rev. 4 22.11.2013
  KMF000.03.05.16.01.01, Rev 0 22.11.2013
  KMF000.03.05.16.02.01, Rev. 0 24.11.2011
  KMF LR Data sheet, Rev. 4 24.11.2011
  KDFK LR Data sheet, Rev. 4 24.02.2011
  KDFK000.04.05.10.01.02, Rev.2 20.03.2014
  KSF000.06.10.02.01, Rev. 0 31.03.2009
  KDFV LR Data sheet, Rev. 2 12.07.2012
  KDFV150.07.05.10.00.20, Rev 1 24.02.2011
  KDFV150.07.05.10.01.20, Rev 1 24.02.2011
  KDFV150.07.05.16.08.20, Rev 4 24.02.2011
  KSF000.07.05.10.02.01, Rev. 0 24.02.2011

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

Lloyd’s Register EMEA
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Lloyd’s Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as “Lloyd’s Register”. Lloyd’s Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd’s Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.
APPROVAL DOCUMENTATION, cont.

KAF LR Data sheet, Rev. 0
KAF150.01.16.05.00.01, Rev. 0
KAF150.00.05.05.01.02, Rev. 0
KAF150.00.16.05.01.02, Rev. 0
KAF150.00.16.10.02.01, Rev. 0
KAF150.00.16.10.02.01, Rev. 0
KRF LR Data sheet, Rev. 4

KAF 2016
KAF DN150 PNS JIS B 2220 K5 FF incl. Parts list 16.05.2014
Body KAF DN150 PN5 16.05.2014
Body KAF DN150 PN5 rubber lined incl. Parts list 16.05.2014
KAF Cover DN150 PN 19 / DNC-50 12.12.2013
KAF Cover DN150 PN 19 / DNC-50 incl. Parts list 12.12.2013
KRF-BF 2016

TEST REPORTS

HPC1461050/01 LR Works Inspection including hydrostatic burst pressure tests at 100 bar for type KSF: DN 50, size 2; KSF: DN 80, size 4 and KSF: DN 100, size 8 14.12.2015
HPC1461050/02 hydrostatic burst pressure tests at 100 bar for type KMF: 2 ½” size 4; type KDF-K: DN 80, size 6 and KDF-K: DN 20, size 2 witnessed by LR Surveyor at Krone in Oyten 17.12.2015
HPC1461050/03 hydrostatic burst pressure tests at 40 bar for type KAF: DN 200, PN 10 and type KDF-V: DN 150, size 7, PN 16 witnessed by LR Surveyor at Krone in Oyten 21.12.2015
HPC1461050/04 Visit of an existing installation with function test of KAF self-cleaning automatic filter at ‘Elbphilharmonie Hamburg’ 11.01.2016

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Hamburg Technical Support Office
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E torsten.schroeder@lr.org

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPENDS ON SATISFACTORY SURVEY AND TESTING

Lloyd’s Register EMEA
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**Supplementary Type Approval Terms and Conditions**

Type Approval certifies that a representative sample of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein. It does not mean or imply approval for any other use, nor approval of any product(s) designed or manufactured otherwise than in strict conformity with the said representative sample.

Type Approval is based on the understanding that the manufacturer’s recommendations and instructions and any relevant requirements of the Rules and Regulations are complied with.

Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.

Lloyd’s Register EMEA reserves the right to cancel or withdraw this Type Approval Certificate in accordance with the LR Type Approval System Procedure.