Filters for safe and effective steam treatment

STEAM FILTER
Series D • HS • DPL
The ZANDER D steam filter element series is manufactured using sintered stainless steel technology.

A cylinder is formed by placing stainless steel metal powder in a press and subjecting it to pressure from all sides. The presence of water during pressing guarantees uniform porosity of the cylinder. After the cylinder has been formed, the actual sintering process is started.

This encourages the individual stainless steel particles to “grow” together via temperatures below the melting point.

The end caps are subsequently welded to the sintered tube. The result is the steam filter element series in a cylindrical form with a voids volume of up to 40%.

**Design characteristics**

- Filter medium made from stainless steel 1.4404 (316L) microporously sintered
- End caps made from stainless steel 1.4404 (316L)
- End caps completely welded
- O-Ring material EPDM (silicone and viton optional)
- Filter porosity 1 micron and 25 micron

**Technical operating data**

- 10 bar maximum permissible pressure differential in direction of flow
- 5 bar maximum permissible pressure drop against direction of flow
- Can be used within a temperature range of -75°C to +200°C

**D series steam filter elements offer**

- Extremely large dimensional stability under high pressure differential and extreme stress.
- A design free from the use of adhesives and binding material thanks to the welded end caps.
- A highly homogenous porosity resulting in high operational capacity with marginal pressure losses.
- Chemical regenerative ability due to the high resistance against acids and alkalis.
- Simple regeneration using ultrasonics or backflushing.
- Steam treatment, from the complete removal of particles right up to culinary steam quality (conforming to 3.A Standard).

Series D filter elements are not just limited to the filtration of steam. They are also suitable for the filtration of air/ gas, hot water and chemicals in all areas of the chemical industry, the food industry, the electronics industry, biotechnology and pharmaceuticals.

Series D steam filter elements are utilised wherever there are demands for economical and effective preparation of steam, from the removal of particles right up to culinary quality.
The ZANDER HS and DPL steam filter element series is manufactured from microporous sintered fibres with a diameter of 2 to 40 microns.

The fibres are first worked into a homogenous mesh, that, in a subsequent sintering process, is made into a wire fabric, as support material. The filter medium can then be rolled to the required density. The extremely high porosity of the metal fibrous web of up to 80% and the very high filter area offered by the pleated filter medium ensure that, in comparison with a depth media, a large number of pore cross sections is available for the steam transfer. This fact ensures an optimum relationship between filter porosity and filter capacity. Dirt, dust and rust particles are not just completely retained on the filter surface, but also within the filter itself.

The ZANDER HS and DPL steam filter element series offers:

- Extremely high operational capacity due to high porosity of up to 80% and a pleated filter medium.
- A low pressure-drop.
- Filter elements from the DPL series with 3” and 4” valve openings.
- High dirt holding capacity due to additional depth filtration effect.
- High regenerative capability, using acid and alkali chemicals, ultrasorics or backwashing
- Large dimensional stability under high pressure differential and extreme stress.
- A design free from the use of adhesives and binding material due to the welded end caps.
- Steam treatment from the complete removal of particles right up to culinary steam quality (conforming to 3.A Standard).

HS and DPL steam filter elements are used wherever large quantities of steam are required to be purified to culinary quality with minimum pressure loss and long filter service life.
The ZANDER S and DG HIGH FLOW filter element housings have been specifically designed for use in the most critical application areas of steam filtration.

High quality stainless steels 1.4301 (1.4404 optional), highly-polished housing surfaces and the avoidance of corners and edges form the basis for the optimised flow design of the S and DG housing series.

The housing is designed in such a way that the steam flows free of turbulence into the housing and through the filter elements. The result is minimal pressure losses through the filter housing and filter element and, therefore, considerable operating cost reductions with a compact system size.

A particularly interesting characteristic is the method of securing the element into the housing. Instead of conventional plug-type adapters with a single interior O-ring, or two external O-rings, a special „Click-Lock“ system has been developed for the HS and DG housing series.

Two external O-rings in connection with a double bayonet ensure completely secure element locking. The danger of bypass through in the O-ring areas is thereby completely eliminated.

If the application requires, the Series S and DG HIGH FLOW filter housings can optionally be equipped with steam filter elements from the Series D and HS/DPL:

<table>
<thead>
<tr>
<th>Housing Type</th>
<th>Housing Inlet and outlet</th>
<th>Dimensions (height width depth)</th>
<th>Serie D in 1 micron Element Designation</th>
<th>Serie D in 25 micron Element Designation</th>
<th>Serie HS/DPL in 1 micron Element Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>S02...</td>
<td>1/4&quot; DN10</td>
<td>220 147 55</td>
<td>D09T 1µm</td>
<td>D13T 1µm</td>
<td>DPL19DPL</td>
</tr>
<tr>
<td>S05...</td>
<td>3/8&quot; DN10</td>
<td>220 147 55</td>
<td>D09T 1µm</td>
<td>D13T 1µm</td>
<td>DPL20DPL</td>
</tr>
<tr>
<td>S07...</td>
<td>1/2&quot; DN15</td>
<td>220 151 55</td>
<td>D09T 1µm</td>
<td>D13T 1µm</td>
<td>DPL20DPL</td>
</tr>
<tr>
<td>S09...</td>
<td>3/4&quot; DN20</td>
<td>220 151 55</td>
<td>D09T 1µm</td>
<td>D13T 1µm</td>
<td>DPL20DPL</td>
</tr>
<tr>
<td>S11...</td>
<td>1&quot; DN25</td>
<td>312 188 75</td>
<td>D09T 1µm</td>
<td>D13T 1µm</td>
<td>DPL20DPL</td>
</tr>
<tr>
<td>S12...</td>
<td>1 1/4&quot; DN32</td>
<td>312 198 75</td>
<td>D09T 1µm</td>
<td>D13T 1µm</td>
<td>DPL20DPL</td>
</tr>
<tr>
<td>S13...</td>
<td>1 1/2&quot; DN40</td>
<td>312 198 75</td>
<td>D09T 1µm</td>
<td>D13T 1µm</td>
<td>DPL20DPL</td>
</tr>
<tr>
<td>S14...</td>
<td>2&quot; DN50</td>
<td>466 233 80</td>
<td>D09T 1µm</td>
<td>D14T 1µm</td>
<td>DPL20DPL</td>
</tr>
<tr>
<td>S15...</td>
<td>2&quot; DN50</td>
<td>792 233 80</td>
<td>D09T 1µm</td>
<td>D18T 1µm</td>
<td>DPL20DPL</td>
</tr>
<tr>
<td>S16...</td>
<td>2 1/2&quot; DN65</td>
<td>792 275 110</td>
<td>D09T 1µm</td>
<td>D18T 1µm</td>
<td>DPL20DPL</td>
</tr>
<tr>
<td>S18...</td>
<td>3&quot; DN80</td>
<td>1056 289 110</td>
<td>D09T 1µm</td>
<td>D19T 1µm</td>
<td>DPL20DPL</td>
</tr>
<tr>
<td>DG19DPL...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>DG20DPL...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

*1 referred to 100 mbar pressure loss (Series D in 1 micron and 25 micron) all operating capacities referred to a flow speed of 30m/s
*2 referred to 25 mbar pressure loss (Series HS and DPL in 1 micron)
Why do we use steam?

Steam is used in many areas of the pharmaceutical industry, food and beverage industry for sterilisation of containers, piping and filter systems.

Steam is used in almost all branches of industry for the heating of factory halls and workshops, for cooking or smoking foods (e.g. jams, sausages, ham, preserves), for vulcanising (e.g. in the manufacture of car tyres), for heating wash water (e.g. in laundrettes) and for driving turbines and pumps.

Steam is a particularly economical medium for transferring large quantities of energy over long distances. It is also easy to produce, as water is a plentiful natural resource.

Steam can pick up a considerable amount of rust particles and pipe scale during generation and conveyance through the pipe system. These particles often affect the downstream process, for example sterile filters may become damaged, the service life and function of valves and equipments may be reduced and the quality of food that comes into contact with dirty steam may be negatively affected.

It is therefore of enormous importance that the steam is prepared using a suitable method of filtration, with the ZANDER steam filter series’ D, HS • DPL, corresponding to the application.

What filter porosities are used?

The filtration of steam with a filter porosity of 25 microns is completely sufficient for many applications.

A Series D steam filter element with a retention rate of 25 microns will certainly remove almost all particles from the steam.

The steam can then be used without problems for sterilising sterile depth filter elements, for smoking ham, for vulcanisation, for heating wash water and for driving turbines and pumps.

Special applications, such as the sterilisation of membrane filter elements and the direct contact of the steam with sensitive food, such as milk or dairy products, require a level of filtration right down to 1 micron.

With a filter porosity of 1 micron, the D and HS/DPL steam filter element series conform to the regulations for generation of culinary steam (3-A Accepted Practices For A Method Of Producing Steam Of Culinary Quality Number 609-01).

If you would like to know more about culinary steam qualities, please do not hesitate to contact our product specialists.

Design of steam filters

One of the primary criteria for the design of steam systems, and therefore also the design of steam filters, is the flow velocity in the piping system. The higher the flow velocity, the larger the resistance of the pipe wall which increases exponentially from the piping system alone. A high flow velocity also subjects the piping system to heavy stresses, as the water droplets carried along in the steam possess abrasive qualities.

Steam systems should therefore be designed in such a way that both the pressure drop and the flow velocity are kept within permissible limits.

The operating capacities of the D and HS/DPL steam filter series are therefore always selected to ensure that the flow velocity does not exceed 25 to 30 m/s.

Furthermore, the pressure drop with 100 mbar for the Series D and 25 mbar for the Series HS/DPL is ideal for economical filtration.
Successful throughout the World

Clear Concept in Form and Function. This is the result of quality, innovation and continuity. This is what the name ZANDER stands for.

ZANDER has developed into a world leader in the fields of filtration, adsorption and condensate technology for compressed air and process gas applications. At ZANDER, qualified personnel are available to provide you with technical and sales support for your inquiries. Factory sales offices located in the USA, France, UK and Italy as well as numerous agencies throughout the World insure excellent support for our customers all around the globe.