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PRESSURIZED GRIT FILTERS

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KUM FILTRE TANKI-1
SAND FILTER TANK-1

PRESSURIZED GRIT FILTERS

General Description and Intended Use

The grit filters are used to remove suspended solid materials, residual and particles causing blurriness in the wastewater. They are used in outlet units of the wastewater treatment facilities and they are also preferred in many different processes in potable water treatment facilities. They are manufactured vertical or horizontal depending on the process.

Working Principle Of Equipment

The working principle of the grit filters was inspired by the nature and developed like all technological equipment. It was noticed that the waters which were filtered in different soil layers and reached the underground were cleaner than the surface water in terms of blurriness and residual content and the water were started to be filtered in soil layers. The grit filters that we use today operate in a similar principle.

There are mineral deposits sorted in various layers in the pressurized grit filters. Mineral deposit is graded from rough grain size to fine grain size from filter base to top side. Quartz grit and glance coal are generally preferred as a mineral. Wastewater to be filtered enters into system so as to be homogeneously distributed from top layer of the filter to whole mineral deposit. The suspended solid materials and other particles in the wastewater passing through the mineral deposit stay in the filter. Filtered wastewater leaves the system from the bottom of the filter. Mushroom type nozzle system is used at the bottom part of the filters, at the undermost part of the mineral deposit.

The filter begins to get clogged due to suspended solid materials and other particles to be kept by the filter after a specific operation time, and an additional pressure loss occurs in the system. Therefore, the grit filters are subject to backwash and rinsing in regular periods.

During backwash procedure, clean water is supplied to the filter from bottom exact opposite to normal working position and is enabled to pass through

mineral deposit. During this backwash procedure, suspended solid materials and other particles kept in the mineral deposit are discharged from the backwash line of the filter. After backwash procedure, filters start to operate in service position again.

During rinsing procedure, clean water is supplied to the filter in the normal operation position and is enabled to pass through mineral deposit. So that, suspended solid materials and other particles kept in the mineral deposit are discharged from the backwash line of the filter. After rinsing procedure, filters start to operate in service position again.

TECHNICAL SPECIFICATIONS

- Even though it varies in accordance with pollution loads and process selection, the grit filters are generally manufactured in a way to have 10-20 m/h section speed.
- All resistance calculations are made while sizing of the system is being conducted and the thickness of metal sheets are selected accordingly.
- Robotic welding is used during manufacturing.
- Each filter is tested under pressure at 1,5 times more than its designed pressure after manufacturing.
- The mirror which is placed at the base of the softener tank are designed to carry the mineral deposit and wastewater load. Filter mirror is supported by means of coupling it to the special design filter lugs. Load of the mirror is shared by lugs.
- It is equipped with mushroom-type diffusers on the mirror.
- A suitable number of diffuser is used in the system by calculating all operation conditions.
- The camber wall thickness is always selected more than side wall thickness.

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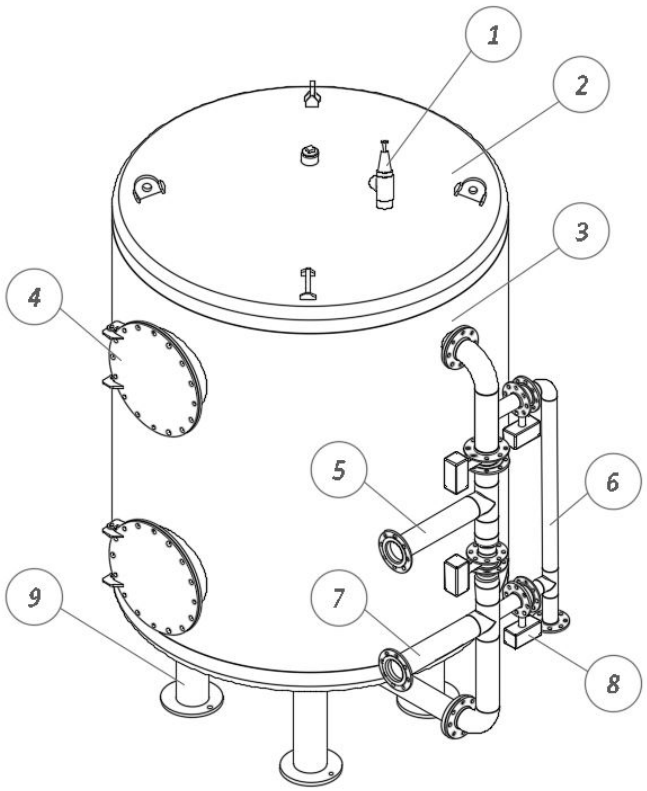
- A special design distribution structure is used to achieve a homogeneous distribution at the section that the wastewater enters into the filter.
- Lateral upper distribution structure is used in the case it is requested in accordance with process selection.
- Manholes are used at the suitable points. Manhole points are selected so as to facilitate interference and maintenance procedures.
- While clarifying manhole directions, pre-piping directions

and other details, the design is made special to the area where the filter to be used in each project.

- During backwash, the mineral deposit height is adjusted at a rate of 60%-70% of the filter side wall height by considering the expansion of the mineral deposit.
- Butterfly valves with electrical or pneumatic actuators are generally preferred for pre-piping of the system.
- Filter systems are supplied with PLC controlled electrical panels. Electrical system is designed to provide the most easy operation conditions.
- It can be operated as time, flow rate and pressure controlled according to process selection.
- In addition, a more effective backwash procedure can be provided by supplying air with the aim of a blower to the filter during backwash in accordance with process selection.
- It is manufactured both vertical and horizontal.
- While building system automation, effects of possible water-hammer are foreseen and all valves prevent the effect of the water-hammer.
- The grit filters are also used as a protector filter equipment before softening and active carbon systems.
- Pre-piping system is equipped with manometer through which pressure difference can be monitored, and with valves providing sampling from grit filter inlet and outlet at any time.
- Safety valve should be used to prevent any damage to the filter in case of any overpressure in the system.
- As a standard, double side manhole cover is used to provide easier and safer filling mineral replacement procedure.

Advantages

- Easy Transportation and Mounting,
- Low Operation and Maintenance Costs,
- Long Operation Life,
- Easy Intervention,
- Possibility to Control and Follow the System Operation over SCADA,
- Simple and Operable Process,
- High Filtration Performance.

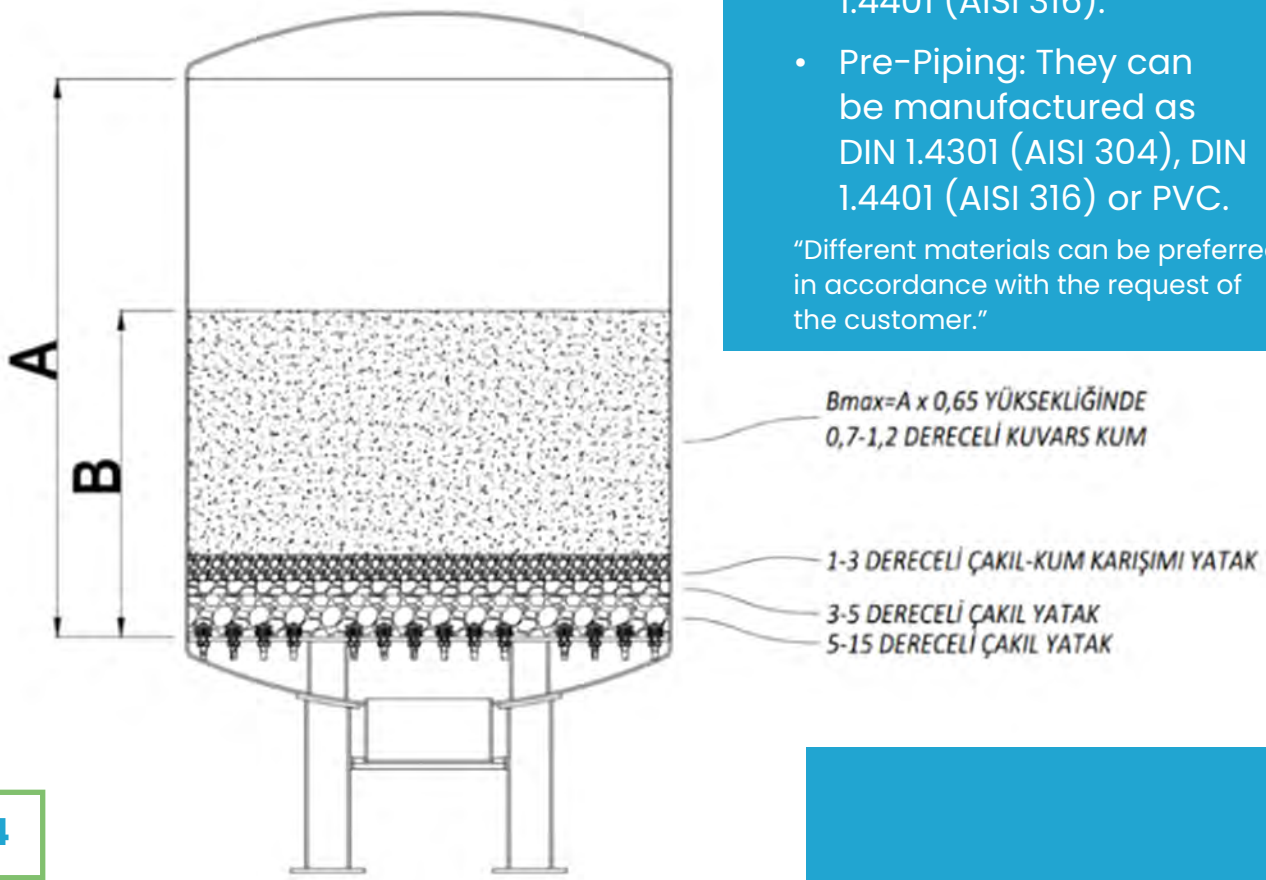


No	Parça Adı / Part Name
1	Relief Valve
2	Camber
3	Side Wall
4	Manhole
5	Wastewater Inlet Line
6	Backwash and Rinsing Outlet Line
7	Filtered Water Outlet Line
8	Check Valves
9	Lugs

Material Details

- Tank: They can be manufactured as S235JR (St52) + Epoxy Paint, S235JR + Hot Dipping Galvanized Coating, DIN 1.4301 (AISI 304) or DIN 1.4401 (AISI 316).
- Pre-Piping: They can be manufactured as DIN 1.4301 (AISI 304), DIN 1.4401 (AISI 316) or PVC.

"Different materials can be preferred in accordance with the request of the customer."



Accessories

- Safety Valve
- Sampling Plug
- Stainless Steel Upper Distribution Structure
- Inlet and Outlet Line Manometer
- Pre-Piping
- Stainless Flap Check Valves with Pneumatic Actuators
- Discharge Valve
- Lateral Distribution Structure*
- Mirror + Nozzle Type Upper Distribution Structure*
- Pipe + Nozzle Type Upper Distribution Structure*
- Inner Paint in Accordance with Food Codex*
- Anthracite Filling Mineral*
- Sight Glass*
- Venturi Flow Rate Control*
- Pressure Switch*
- Pulse Output Flow Meter*
- Electromagnetic Flow Meter*
- Check Valves with Electrical Actuator*

* Optional accessories are defined.

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