

QUALITY
WITHOUT
COMPROMISE



AS STRONG AS STEEL
WITH THE CORROSION
RESISTANCE OF POLIESTER

A lot of
small
things
that make a **HUGE**
DIFFERENCE



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Engineering and
manufacturing
of GRP products
for water treatment

WHY CALPLAS?

Which is the best material?
First question is...

STEEL TANKS

PROS: Very reliable and strong vessels.

CONS: These suffer from corrosion and require continuous maintenance to replace the different linings used (epoxy painting, rubber coatings...).

FIBER GLASS TANKS

PROS: No corrosion.

CONS: Most polyester vessels are built for the swimming pool industry, where both pressure requirements and reliability fall far short of what is required in any industrial project.

Why dont we use both?

Calplas uses only the most reliable GRP Polyester technology in its manufacturing process.

MANUALLY LAMINATED HAND LAY UP.

This means that the fibers are oriented in the directions of the maximum tensions of the filter, strictly calculated. On top, this is combined with encapsulated internal steel reinforcement used at all points where the filter is under additional stress. This makes our filters the most reliable on the market.

Polyester technology.

Calplas uses hand lay out. This means that the fiberglass reinforcement is just working in the principal stress directions: vertical and horizontal. Others technologies which are mixed in other manufacturers not only do not have these fiberglass properties but they have some parts the fiberglass in all directions which gives, from the technical point of view, some random possible behavior of the material.

This technology is also key to have a precise and unique mechanical properties of the polyester. This is the reason why a filter under pressure of calplas do not expand while all others do that. This "expansion" due to the reasons mentioned above, is dangerous in the long term and causes undesirable stress and fatigue after some years. In other words complete reliability.



Fiber glass view. It is key that the fiberglass is oriented in the directions of the maximum tensions the filter will have to handle.



Steel reinforcements:

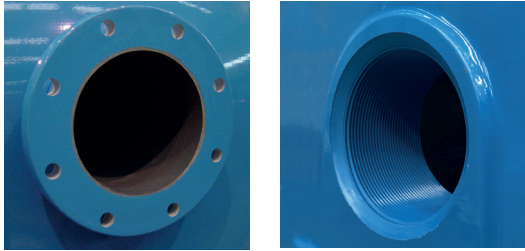
CALPLAS is unique in having steel reinforcements in key and critical parts. Steel is brought under a unique process developed by CALPLAS consisting treating physically and chemically to ensure a correct assembling with the fiberglass. The nozzle plate is internally reinforced by a steel grid specially designed for each diameter. Manholes, and emptying holes have also steel reinforcements. This use of steel and the way to use it in critical points of the vessels allow CALPLAS to have a big market in water treatment with high pressures where no other polyester manufacturer can compete. Water treatment field do not allow a single mistake (a factory cannot be stopped). This experience in water treatment makes that working with low pressures like the one used in swimming pool field is far away for being a challenge for CALPLAS. CALPLAS is the unique polyester manufacturer that have 3000 diameter nozzle plates working in vessels under 6 bars.

Due to confidential reasons (many of our practices are being copied by other manufactures, we cannot show pictures of steel parts embedded in the filters).

DETAILS IN MANUFACTURING

CONNECTIONS

Any thread, any flange, is part of the body. All is polyester. PVC fittings are avoided since the PVC and the Polyester do not stick together with 100% liability. If PVC flanges are used (such as in our competitors) some parts have to go through the wall of the polyester. this is a source of problems. obviously we avoid this situations and all CALPLAS connections are polyester manufactured.



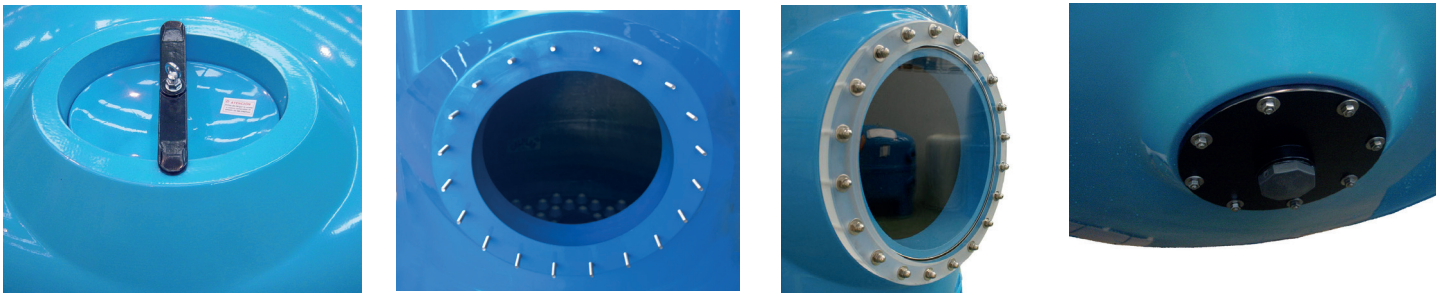
CYLINDRICAL HEIGHT AD-HOC

We can manufacture any cylindrical height required for each application, this will allow to have the proper expansion height during backwash



OPENINGS IN THE FILTERS

CALPLAS Openings came out of the mold. No holes are made (which is not a good practice) for accessing to the filter. This avoids future problems on the filter in this points. Lateral manhole lid is manufactured in plasticized steel to avoid corrosion and top elliptical access is manufactured in GRP. This accesses are manufactured also with steel inside.



CALCULATION CODE

Calplas vessels have been installed during the past 53 years showing that a polyester vessel under pressure can be reliable and can have a lifespan of more than 25 years. Our vast experience, together with the hand layup technology, and a rigorous calculation are key for this result.

Several calculation codes are used: AD-MERKBLATT and EN-13121-3. In such calculation codes, the thickness of different parts of the vessel are obtained. For each diameter, and pressure, different thickness values are obtained for the cylindrical part, the top and bottom ends, and the knuckle areas. In Calplas we follow these standards, and we apply different thicknesses in different areas.

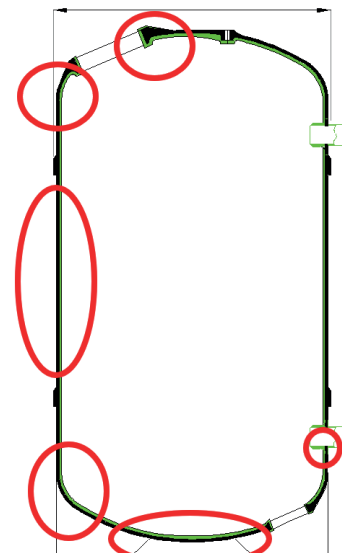
After many years working in industrial tanks, Calplas has a big experience with single nozzle plate tanks, double nozzle plate tanks or even three nozzle plate tanks. As a result, dealing with a single nozzle plate like many public filters is far from being a challenge for us.

Our experience shows that there are some critical areas where polyester do not allow a complete liability (manholes, nozzle plates...), and hence we use internal steel reinforcement. The most advances calculation methods such as Finite Element Analysis complete our knowledge about the behavior of polyester.

Reinforcement is calculated
For Each diameter
For Each Design Pressure

Internal lining according
to requirements

NaOH / HCl / H₂SO₄ ...
Food Contact
Drinking water
Ozone
...



DETAILS IN PERFORMANCE

ARMS COLLECTORS / LATERALS DISTRIBUTION

Each filter distribution with arms has been designed for an optimum flowrate according to the different flanges available for the filter during the operation phase.

In filtration applications, as important as the filtration is the backwash. This is the way we regenerate the filter for a proper filtration again. Maximizing the filtration area is a key point and also avoiding dead zones where bacteria can grow causing preferential pathways and a bad performance of the filter.

Piping and length and distribution is calculated so that the water comes equally throughout the complete length of the arms. Ensuring the best backwash possible. An inadequate distribution design can make water just come out throughout the first half of the arms, producing a poor backwash and probably causing severe problems of dead zones where bacteria can grow dramatically, and creating preferential pathways. This will cause a decrease of the filtration surface and your filter will become "smaller" with time. Filter could be biofouled and channeling would appear in the end.

In Ionic Exchange applications we also want to have a proper repartition of the regeneration. If the vessel is not able to spread the flow properly all the resin will not be regenerated equally. This means a loss of performance.



NOZZLE PLATE DISTRIBUTION

Nozzle plate distribution will give a complete equal distribution of the flow. We manufacture the nozzle plate to maximize the surface of the vessel to the limit.

Nozzle plate in all other manufacturers are always made out of the vessel, then make the drills, and at a last stage it is "glued" to the filter. This task reduces the cost of manufacturing but makes the border of the nozzle plate too weak.

CALPLAS manufactures the nozzle plate together with the body, this is the reason why a unique and complete liability of our nozzle plates. If we add this to the fact that it is internally reinforced with a steel grid and supported from the bottom part it can be found out why Calplas is used to manufacture not only vessels with a bottom nozzle plate, two or three nozzle plates in the same vessel.



TOP DISTRIBUTION

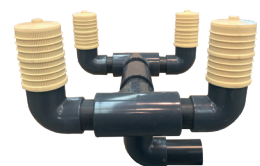
We adapt our top distributor to the need of the vessel according to the application and flow. This is a key to spread the flow.

In filtration our diffusers will spread the flow equally, but also will keep the top surface flat. This is very important to keep a constant bed height and avoid preferential pathways. We will change the diffuser if the media is AFM/Sand or Active carbon... We will install the best diffuser to make the vessel do the best job to the media inside.

In ionic exchange applications we want regeneration flow to be equally distributed, but also we do not want to lose the resins. We will adapt our top diffuser to create a maximum pressure drop of 0.1 bar in maximum flow phase.



Calplas GRP diffuser
AFM or Sand



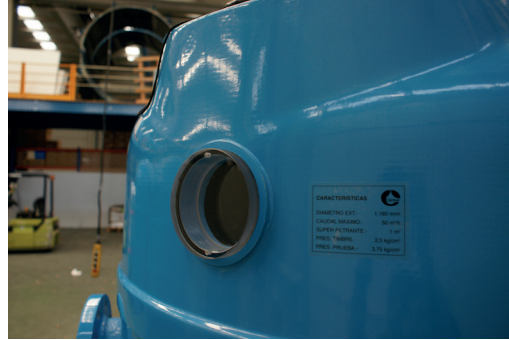
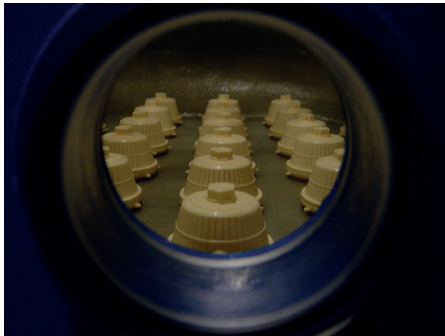
KSH distribution system
Active carbon / Ionic exchange

MORE DETAILS

SIGHTGLASSES

SIGHTGLASS IS A MUST.

Sightglass is a window to inside the filter. It is a window to reality. To what is happening inside the vessel. Without a sightglass you will just have the faith that everything is working correctly. We want you to see the truth.



100% full vision inside: Methacrylate sightglasses

QUALITY CONTROL



EACH AND EVERY FILTER MANUFACTURED IS TESTED BEFORE LEAVING OUR FACTORY

2,5 kg/cm² → 3.75 kg/cm²
4 kg/cm² → 6 kg/cm²
5 kg/cm² → 7.5 kg/cm²
6 kg/cm² → 9 kg/cm²
7 kg/cm² → 10.5 kg/cm²

AND MORE...



Special colors on demand



Closed legs are part of the filter structure.



On site assembling by Calplas Technicians



UV resistant external gel coat.



Wind & Seismic Calculation



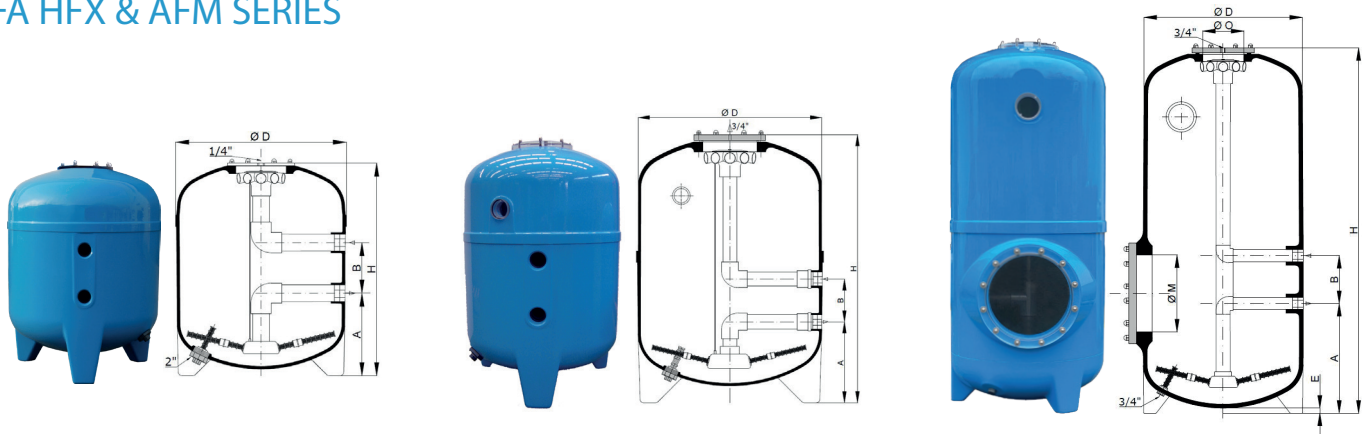
Replace/Upgrade your filter
PLUG & PLAY

FILTRATION

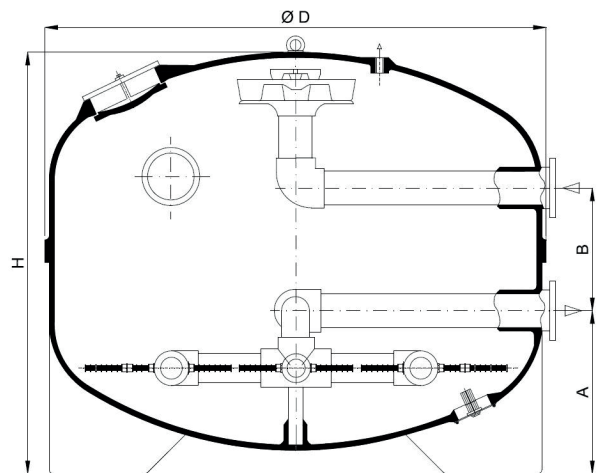
Ø415 - 3000 mm
Design pressure 2.5 - 7 Kg/cm²

STANDARD FILTERS

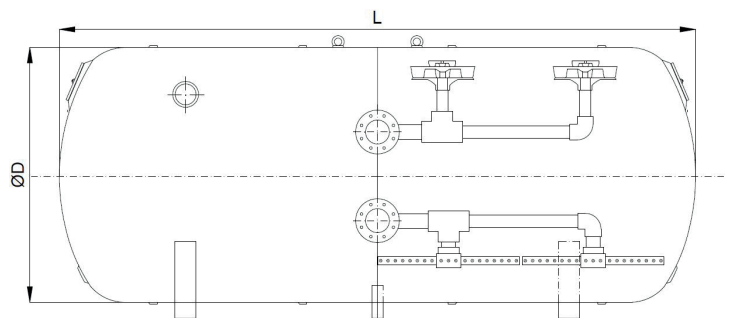
FA HFX & AFM SERIES



FB SERIES



HORIZONTAL SERIES



FILTRATION

Ø415 - 3000 mm
Design pressure 2.5 - 7 Kg/cm²

AD-HOC FILTRATION COLUMNS

D & DC SERIES



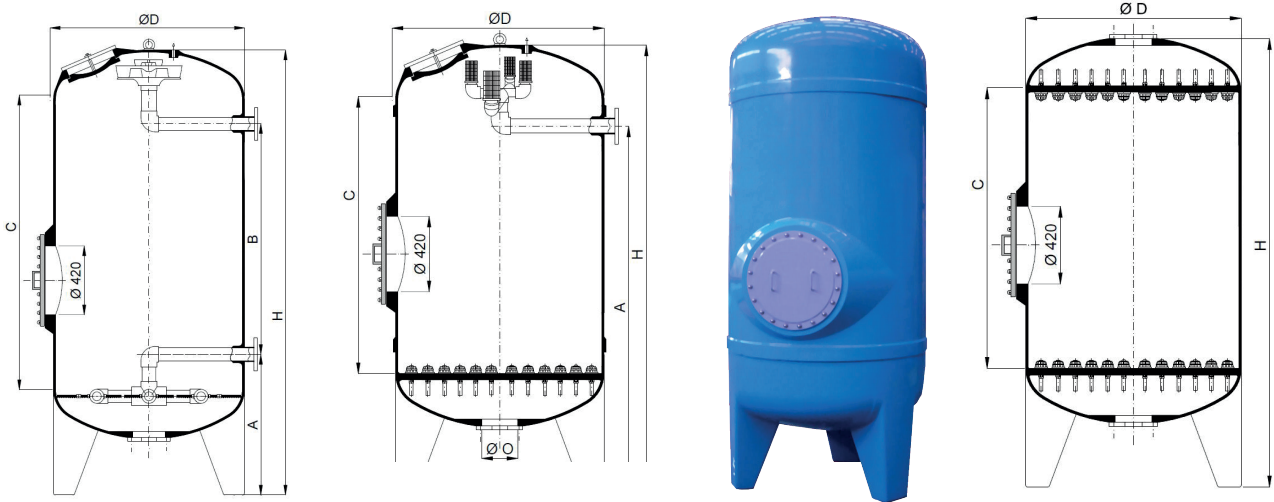
DP SERIES



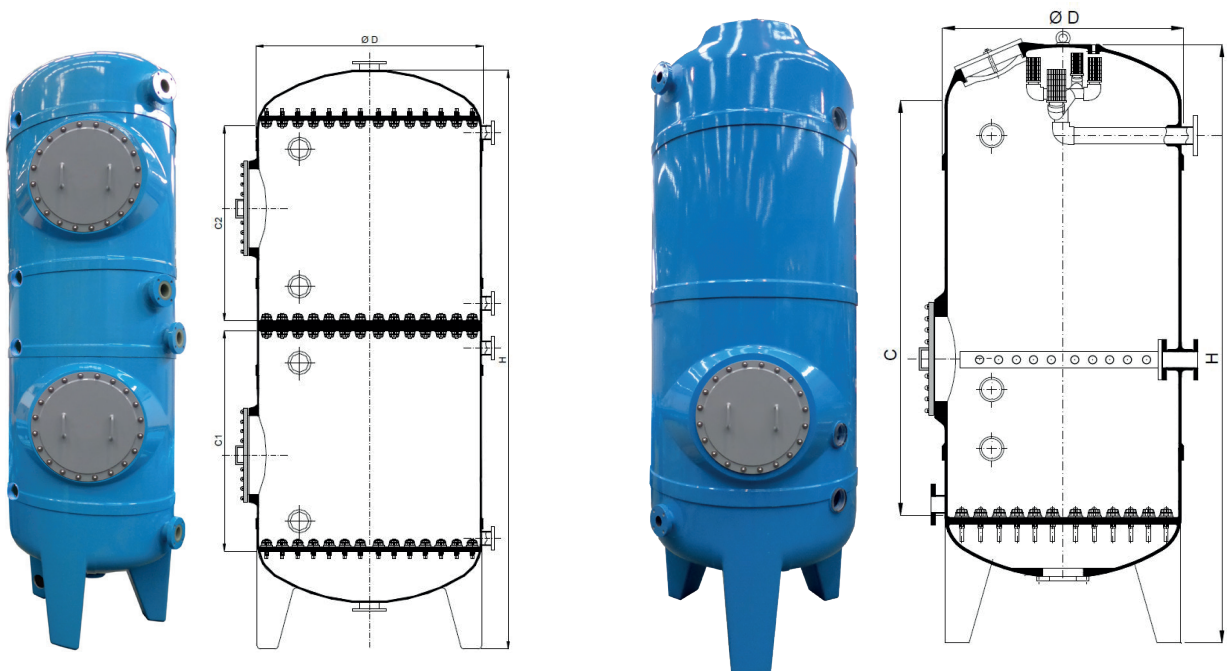
IONIC EXCHANGE

Design pressure 2.5 - 7 Kg/cm²

VESSELS WITH LATERALS / 1 OR 2 NOZZLE PLATES



VESSELS WITH 3 NOZZLE PLATES / MIXED BEDS





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