

1. FILTER

1.1. Design standards

According to the European Directive for Pressure Vessels 97/23/CE, it is established in its article 3, section 3 that the pressure vessels with inferior or equal characteristics to the values specified in chapters 1.1, 1.2, 1.3 and in section 2, have to be designed and manufactured according to the standard procedures in order to ensure a safe use. At the same time this equipment will be supplied with an instruction manual and will be labeled specifying the manufacturer, these equipment do not have to be "CE" labeled.

All the equipment specified are manufactured under the standards specified in its article 3, section 3, since they are equipment with a maximum working pressure of 2,5 bar, maximum working temperature of 40°C and not adequate to contain dangerous liquids. See chemical resistance chart.

In order to design the pressure vessels, three world recognized standards have been taken into consideration; AD-Merkblatt N1 (Germany), BS4994 (United Kingdom). These standards specify the calculation method of the vessel, the raw materials requisites, and the essays to be performed to the materials, prototypes and products.

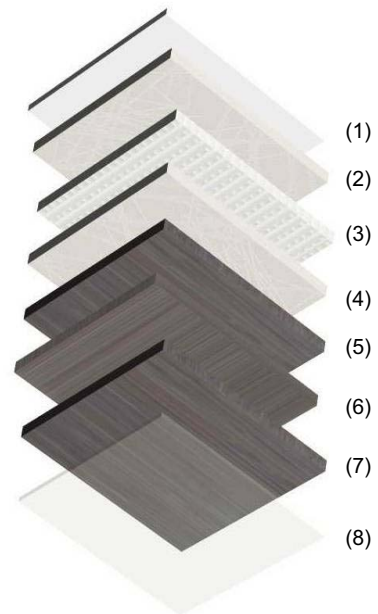
The vessel calculations are based on the standards mentioned previously, choosing in each circumstance the mathematical model that is more adequate to our productive process and also considering the characteristics of the materials used.

Each pressure vessel with no exception, once it is finished and before expedition, is submitted to a hydraulic pressure tests of 1 1/2 times the maximum working pressure. The conditions for the product acceptance require there is absolutely no leak at all in any part of the vessel.

Once the pressure essay is passed, our quality inspectors verify the accomplishment of all the technical specifications of the product.

1.2. Construction Characteristics according DIN 18820

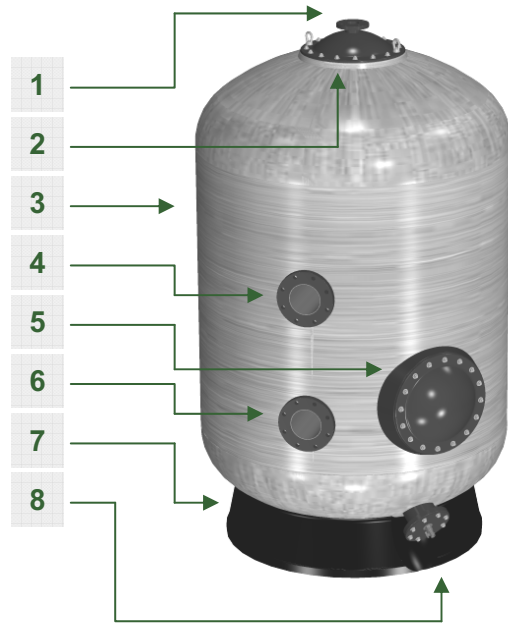
- (1) Smooth surface non-reinforced internal layer, in contact with the filtered media in vinylester material. CSS-PHA.
- (2) Non-oriented layers, with high vinylester resin content 65% CSS-PHA-M.
- (3) On the heads, connections and manholes: oriented layers low vinylester resin content 45% CSS-PHA-MW2.
- (4) Non-oriented layers with high vinylester resin content 65% CSS-PHA-M.
- (5) Oriented wounded layers with circumferential fibers and high mass content 70% with vinylester CSS-PHA-FM6.
- (6) Oriented wounded layers with longitudinal fibers and high mass content 70% with vinylester CSS-PHA-FM6.
- (7) Oriented layers with circumferential fibers and high fiber mass 70% with vinylester CSS-PHA-FM6.
- (8) External protective coating light grey colour min. 400 microns .



Mechanical filtration by means of single layer or sand and antracite multilayer bed, only for use in swimming pools. Maximum pressure 2,5 bar. Maximum temp. 40°C

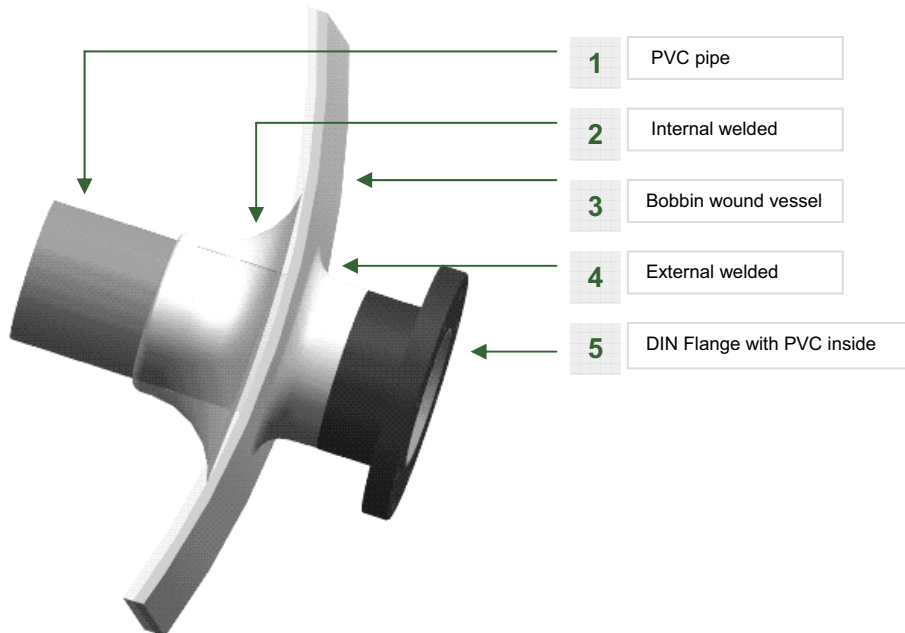
1.3. Equipment

- Top air relief at the highest point
- DN 400 mm. top lid with elevation rings
- Bobbin wound vessel completely in vinylester and E glass fiber
- Dirty water inlet with double welding reinforced with PVC inside
- DN 400 mm or 500 mm or 600 mm according choosen model side manhole
- Clean water outlet with double welding reinforced and PVC inside
- GRP base
- GRP Flange air backwashing conection and inspectioun under nozzle plate



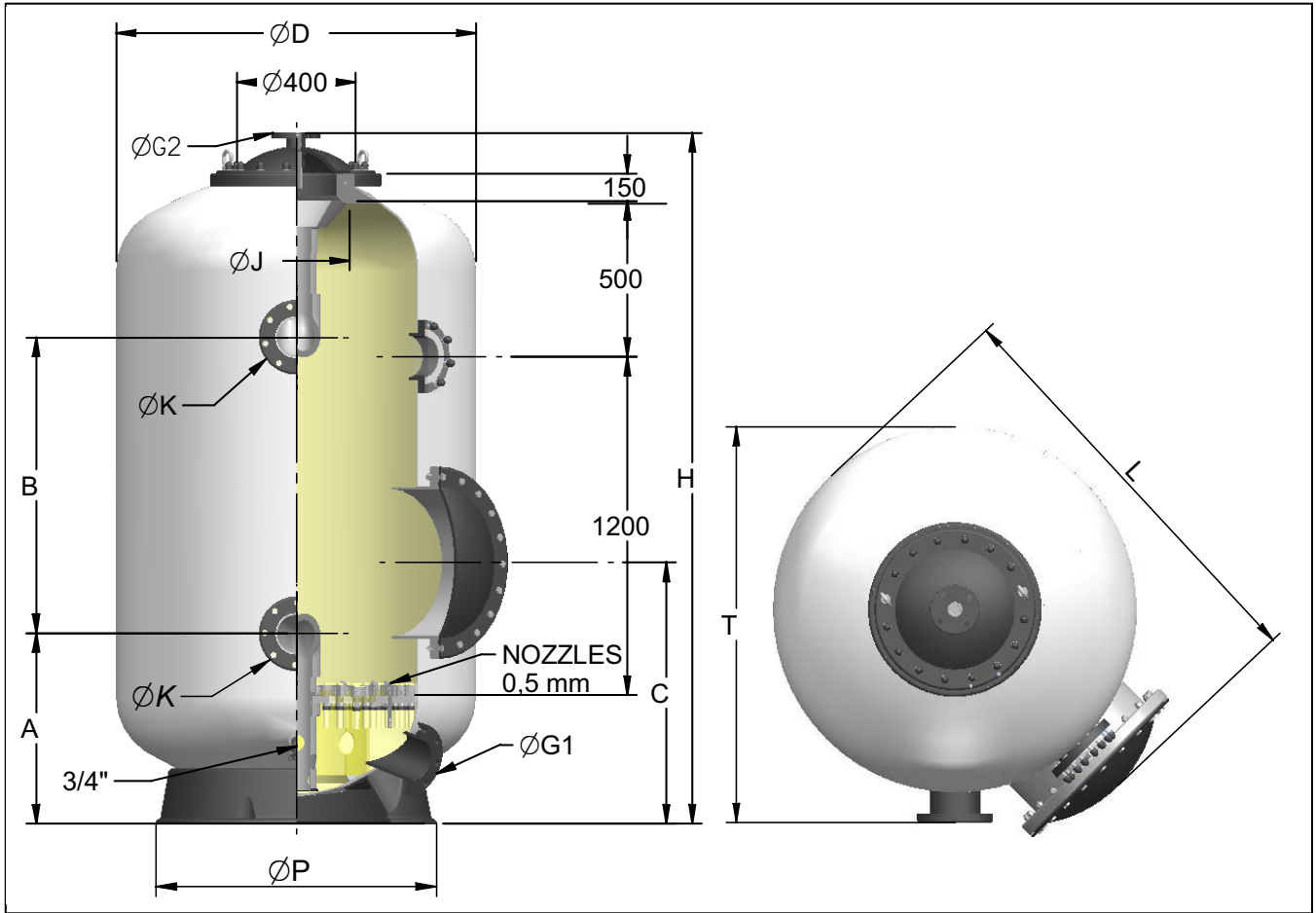
1.4. Double welding connections

This connection design ensuring high performance. These have been welded to the vessel either in the inside and the outside.



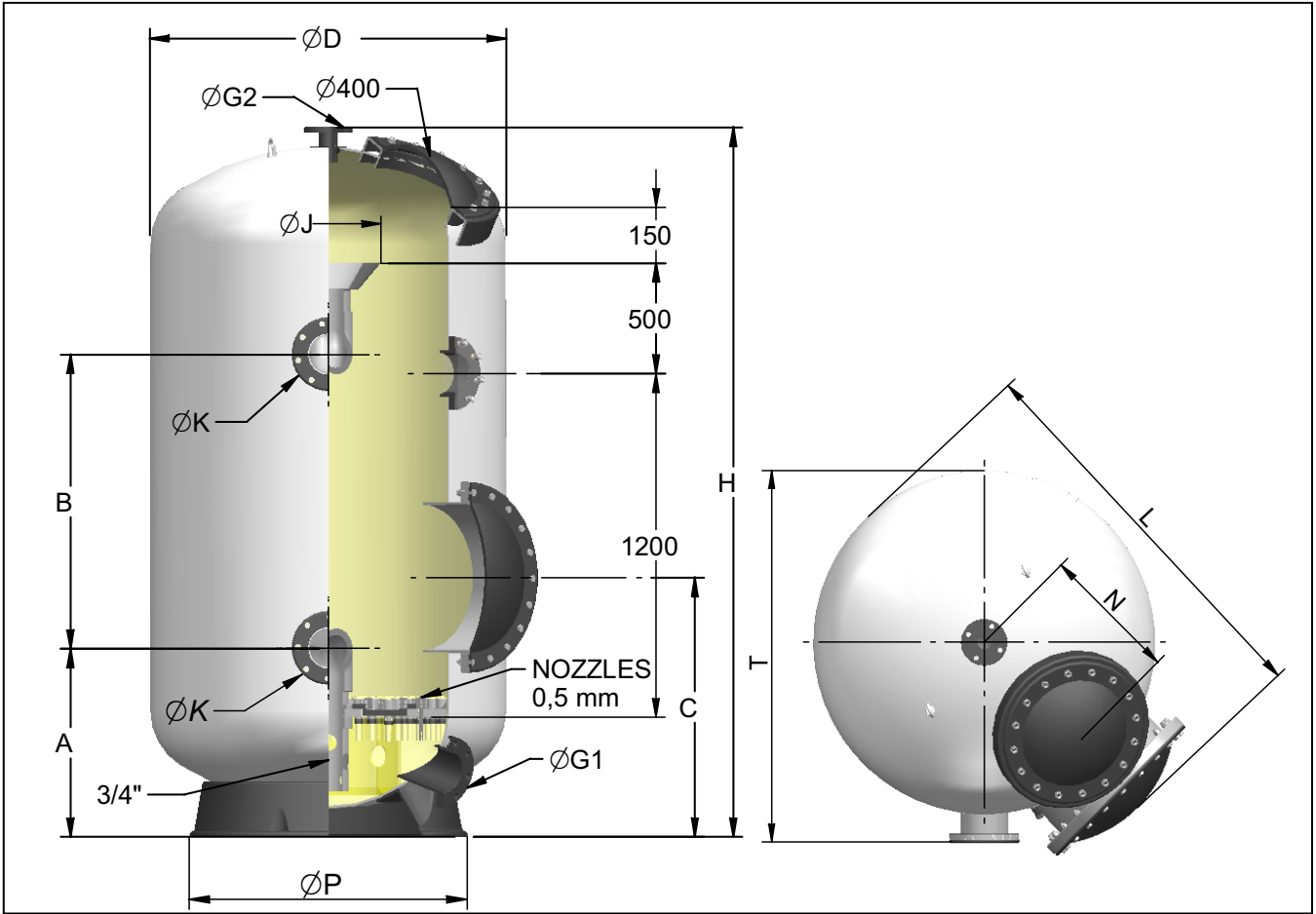
1.5. General dimensions

D=1050 to D=1400mm



Ø D (mm)	Ø E (mm)	Recommend filtration velocity (m ³ /h/m ²)	Inlet/outlet connections Ø K (mm)	Total height H (mm)	Volume (liters)	Service weight (kg)	Net weight (kg)	Recommend flow (m ³ /h)	Surface filtration (m ²)	(einheiten)	Number of nozzles				Base			Backwash air inlet Ø G1	Air relief outlet Ø G2	Top manhole Ø I (mm)	Lateral manhole Ø O (mm)	Sightglass Ø R (mm)	Recommended backwash velocity m/h	
											A	B	C	L	Ø P (mm)	T	Underdrain access hole Ø J							
1050	1100	30	125	2420	2719	3380	224	25	0,86	60	700	1000	940	1275	730	1155	125	360	75	63	400	500	140	60 65
1200	1250	30	140	2420	3200	4323	397	33	1,13	76	700	1000	940	1425	940	1380	245	360	140	63	400	500	140	60 65
1400	1450	30	160	2520	5662	5818	570	46	1,54	107	830	900	940	1625	1083	1505	245	360	140	63	400	500	140	60 65

D=1600 to D=2350mm



Ø internal diameter	Ø external diameter	Recommend filtration velocity	Inlet/outlet connections	Total height	Volume	Service weight	Net weight	Recommend flow	Surface filtration	Number of nozzles				Base				Backwash air inlet	Air relief outlet	Top manhole	Lateral manhole	Shightglass	Recommended backwash velocity		
Ø D (mm)	Ø E (mm)	(m ³ /h/m ²)	Ø K (mm)	H (mm)	(liters)	(kg)	(kg)	(m ³ /h)	(m ²)	(einheiten)	A	B	C	L	Ø P (mm)	T	N	Underdrain acces hole	Ø J	Ø G1	Ø G2	Ø I (mm)	Ø O (mm)	Ø R (mm)	m/h
1600	1650	30	200	2520	7691	8125	630	60	2,01	139	830	950	940	1825	1230	1705	400	245	360	140	63	400	500	140	60 65 68
1800	1850	30	225	2570	9860	9750	705	76	2,54	173	900	920	940	2025	1390	1905	450	245	360	140	63	400	500	140	60 65 68
2000	2050	30	250	2660	12203	12513	810	94	3,14	210	950	760	940	2225	1550	2105	480	245	360	140	63	400	600	140	60 65 68
2350	2400	30	250	2800	17573	17680	1238	130	4,34	286	1050	680	940	2575	1850	2455	550	245	600	140	75	400	600	140	60 65 68

1.6. Media recommendations

Ø internal diameter (mm)	1050	1200	1400	1600	1800	2000	2350	Height (mm)
SINGLE LAYER								
Sand 0,4-0,8 mm (kg)	1.300	1.775	2.300	3.000	3.800	4.650	6.300	1.100
Gravel 1-2 mm (kg)	150	175	250	300	400	500	675	100
MULTI LAYER								
Hidroantracite (kg)	450	475	775	1.000	1.275	1.575	2.175	600
Sand 0,4-0,8 mm (kg)	475	625	825	1.100	1.400	1.700	2.350	400
Gravel 1-2 mm (kg)	150	175	250	300	400	500	675	100
Gravel 3-5 mm (kg)	150	175	250	300	400	500	675	100

1.7. Chemical resistance

Chemical name	Chemical formula	Concentration	max. Temperature °C	
Acetic Acid	CH ₃ COOH	5%	20	R
Aluminium Chloride	AlCl ₃	Saturated solution	40	R
Aluminium Hydroxide	Al(OH) ₃	Solid suspension	40	R
Aluminium Sulfate	Al ₂ (SO ₄) ₃	Saturated solution	40	R
Boric Acid	H ₃ BO ₃	5%	20	R
Ferric Chloride	FeCl ₃	Saturated solution	40	R
Ferric Sulfate	Fe ₂ (SO ₄) ₃	Saturated solution	40	R
Ferrous Sulfate	FeSO ₄	Saturated solution	20	R
Hydrochloric Acid	HCl	5%	20	R
Lead acetate	Pb(C ₂ H ₃ O ₂) ₂ ·3H ₂ O	Saturated solution	40	R
Nitric Acid	HNO ₃	5%	20	R
Ozone mixed in water	O ₃	0,4 ppm	40	R
Phosphoric Acid	H ₃ PO ₄	5%	20	R
Salt Water	-	Sea water	40	R
Sodium Carbonate	Na ₂ CO ₃	Saturated solution	40	R
Sodium Hydroxide	NaOH	5%	20	R
Swimming pool water	-	-	40	R

*The concentrations, unless it is said the opposite, are expressed like percentage in mass to 20°C.

R: resistant