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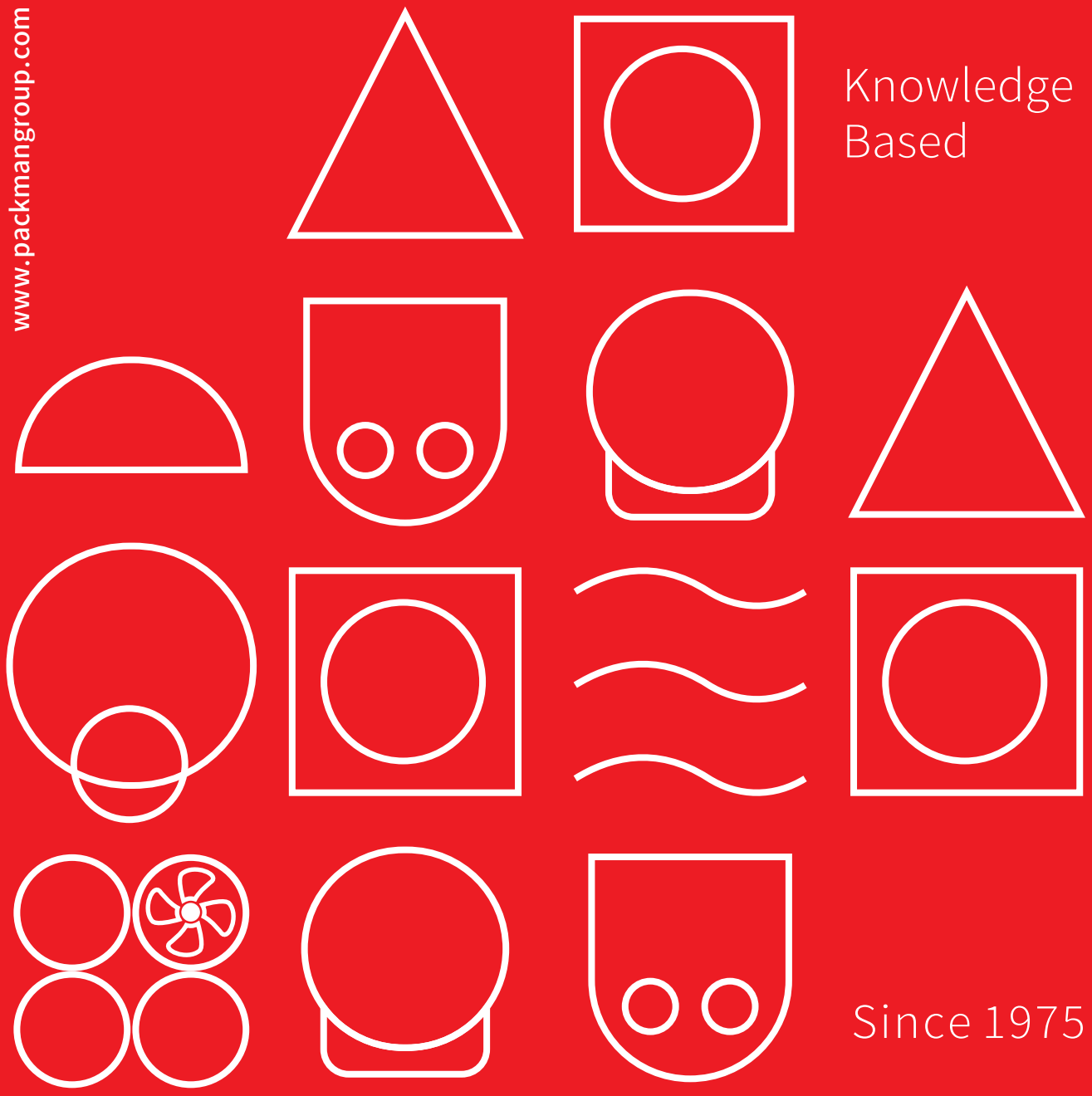
Knowledge
Based

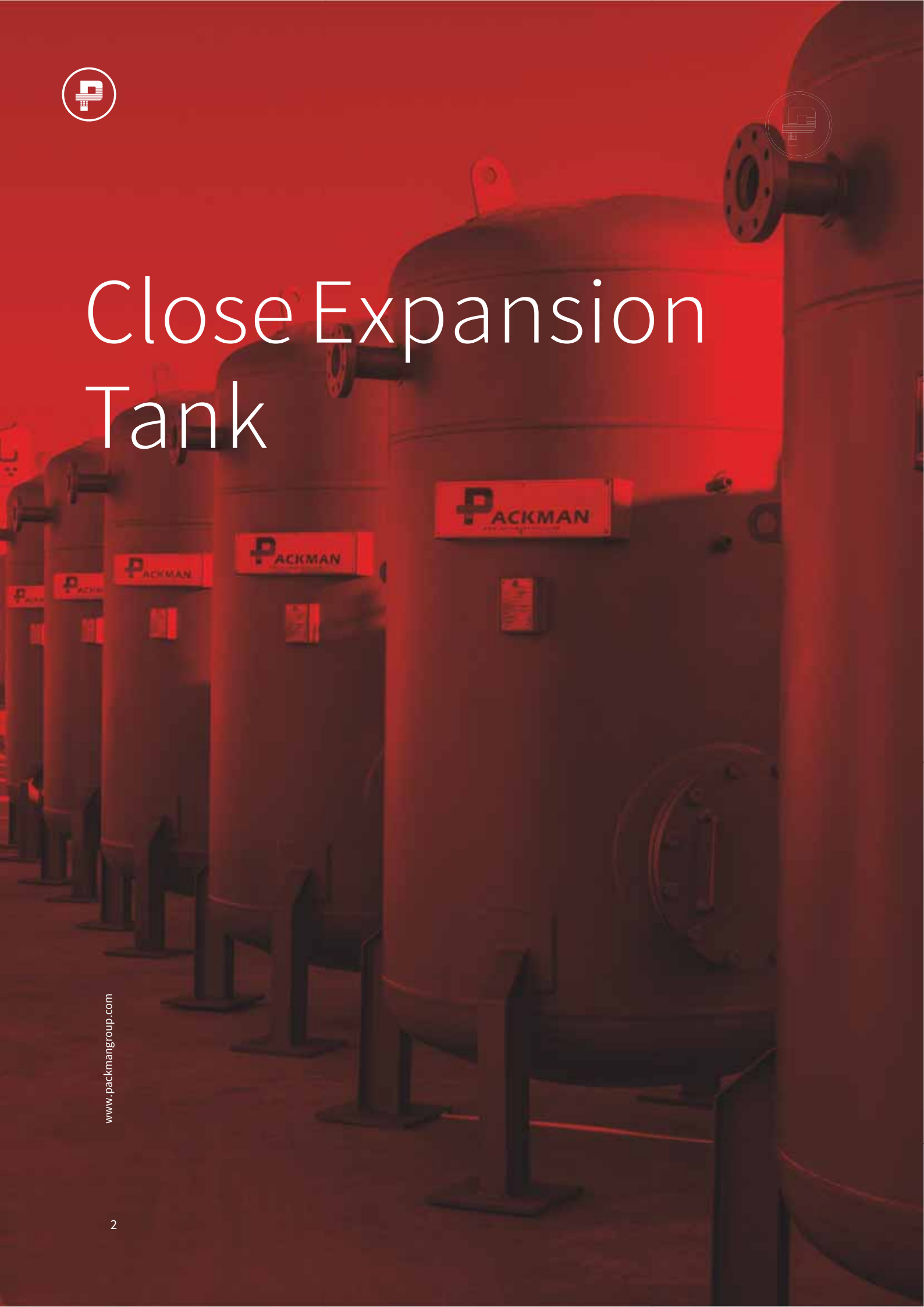


Since 1975

PACKMAN
Industrial Group

Close Expansion Tank

Close Expansion Tank



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Product Description

Expansion Tanks are required in a closed loop heating or chilled water HVAC systems to conserve the expanding fluid and limit the pressure within a heating or cooling system. A properly sized tank will accommodate the expansion of the system's fluid during the heating or cooling cycle without the system having to experience critical pressure limits. The expansion tank uses compressed air to maintain system's pressure by accepting and expelling amount of extra water due to the changing volume of as the heat water & cool water. Some tank designs incorporate a diaphragm or bladder to isolate the expanded water from the pressure controlling air cushion. As water is expanded, it is contained in the bladder to prevent corrosion. The pressure controlling air cushion is pre-charged at the factory and can be adjusted in the field to meet critical system requirements. This design allows the designer & engineers to reduce tank sizes down to 80%.

Expansion tanks are designed to absorb expansion forces and control of the pressure in heating/cooling systems. This tank is the oldest style design and works well when the air is controlled and kept in the tank, not in the system. The expansion tank has been used for many years and works very well in specific systems. A plain steel expansion tank also requires an air control system. The air volume or air cushion above the water level in the tank must be controlled. The common face between this air cushion and the water in the tank allows the air to be absorbed by the water. If the air is not removed properly from the water and placed back into the air cushion, the expansion tank will become waterlogged.

PACKMAN Closed Expansion Tank Properties

PACKMAN's Closed Expansion Tanks are made of SA 36 (St 37.2 in accordance with DIN standard) or in case of customer's request they can be made of 17MN4 (which is Suitable for boiler construction) with a certain thickness and without any change in price.

Manufacturing Standards

ASME Sec VIII, Div. 1 is observed in the construction of closed expansion tanks.

Torispherical / Elliptical Head

PACKMAN's Closed Expansion Tanks head is Torispherical. This type of head

has a longer life and a higher pressure strength compared to other shapes with the same thickness. The production price/per kilo of these heads can reach to twice the price ratio of the usual heads on the market.

Welding Procedure

Welding is done with the Swedish ISBU submerged arc welding equipment. After constructing the tank and welding the lugs, the body of the tank is connected to the heads using a submerged arc welding method. The heads are welded internally and externally, which increases their life and strength. In the root pass, the TIG, argon or other welding methods with the 6010 cellulose electrode is used. The EW7018 electrode is used in fill pass. Finally the submerged method with EW7018 electrodes is used in the cover pass.

Product Capacity Calculation & Selection:

Required volume in a closed expansion tank

Vet = k Vw [(v1 / v0) - 1] / [(pa / p0) - (pa / p1)]

Vet = required expansion tank's volume

pa = atmospheric pressure - 14.7 (psia)

p0 = system's initial pressure - cold pressure (psia)

p1 = system's operating pressure - hot pressure (psia)

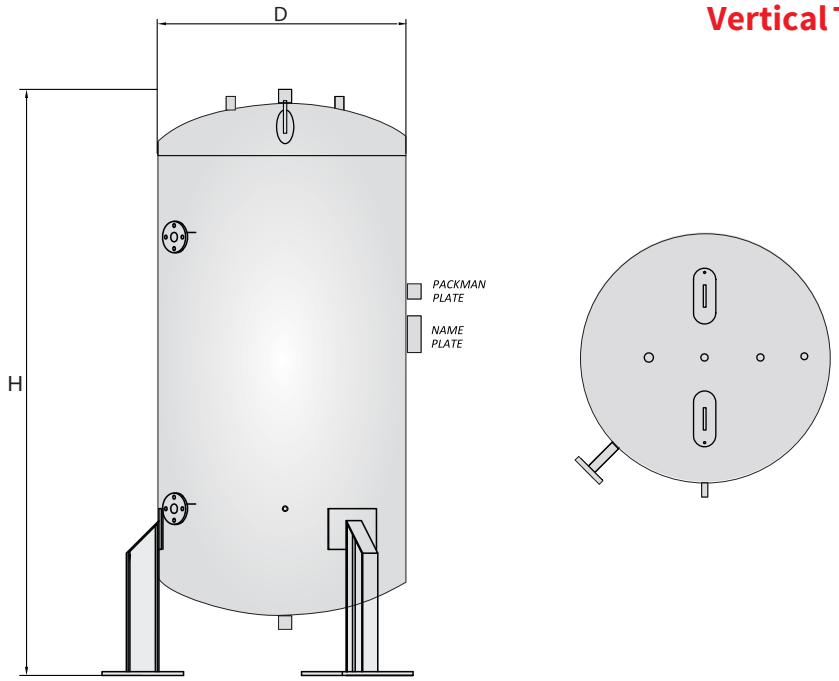
k = safety factor (approximately 2 is common)

Vw = water volume in the system (gallon, liter)

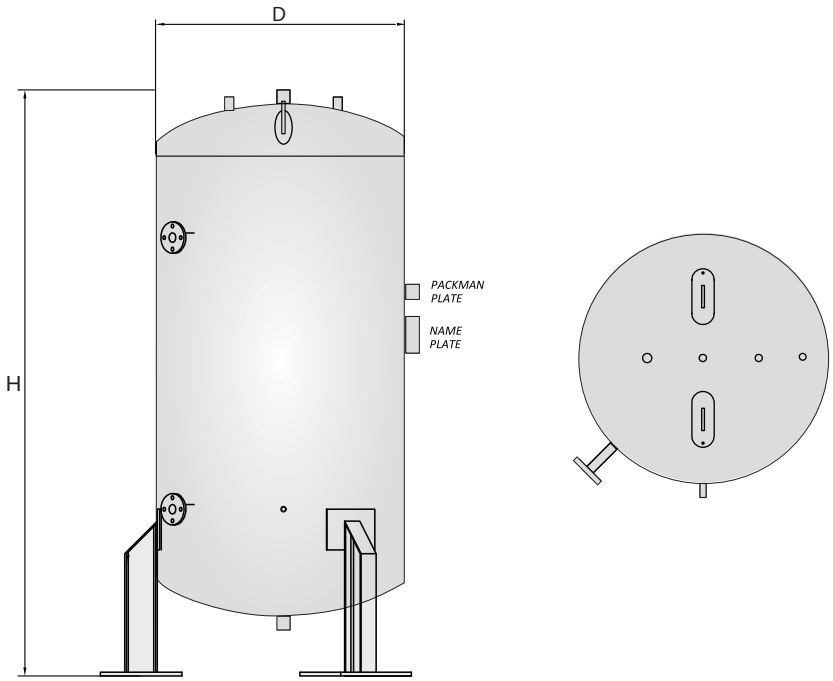
v0 = specific volume of water at initial (cold) temperature (ft3/lb, m3/kg)

v1 = specific volume of water at operating (hot) temperature (ft3/lb, m3/kg)

Vertical Type

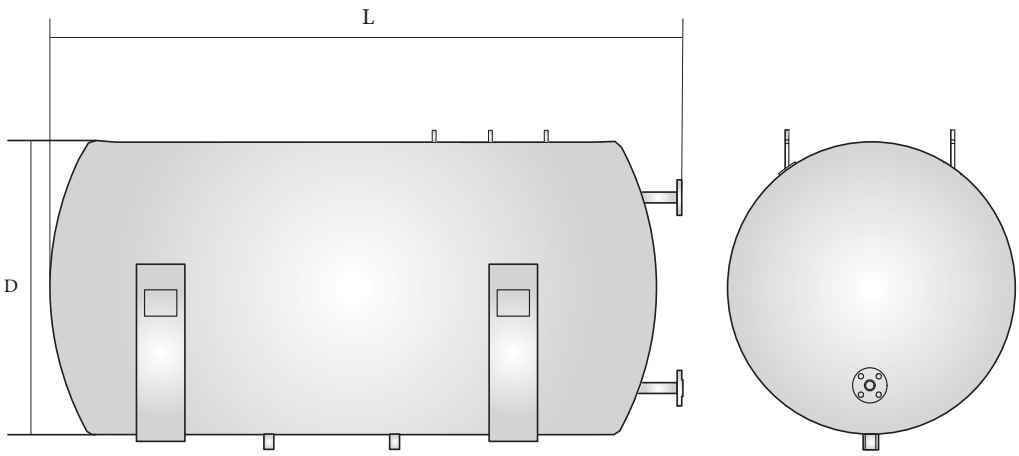


Model	Unit	PCET-300	PCET-500	PCET-800	PCET-1000	PCET-1500	PCET-2000	PCET-2500
Technical Data								
Design Standard	-	ASME SEC. VIII. DIV.1						
Vessel Type	-	Vertical						
Volume Capacity	litr	300	500	800	1000	1500	2000	2500
Vessel Water Pressure Drop	bar	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Connectoins Size								
Safety Valve	in	3/4	3/4	3/4	3/4	3/4	3/4	3/4
Pressure Indicator	in	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Drain	in	3/4	3/4	1	1	1	1	1
Level Gauge	in	1	1	1	1	1	1	1
Spare	in	1/2	1/2	1/2	1/2	1/2	1/2	1
Nitrogen Inlet	in	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Water Inlet & Outlet	in	1	1	1 1/2	1 1/2	1 1/2	1 1/2	2
Material								
Shell	-	Carbon Steel						
Toris Head	-	Carbon Steel						
Vessel Dimensions								
Vessel Diameter (D)	mm	610	800	800	900	1100	1200	1320
Vessel Height (H)	mm	1500	2200	2200	2200	2200	2300	2300

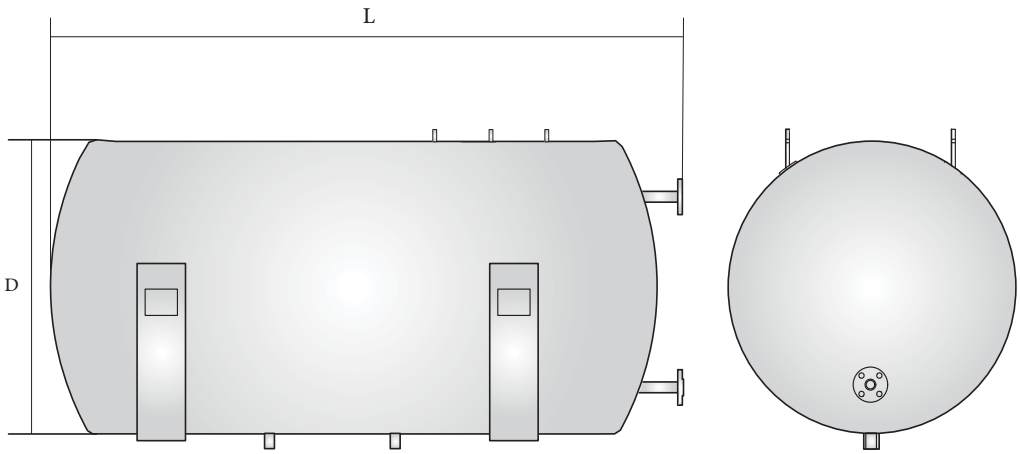


Model	Unit	PCET-3000	PCET-3500	PCET-4000	PCET-5000	PCET-6000	PCET-7000	PCET-10000
Technical Data								
Design Standard	-	ASME SEC. VIII. DIV.1						
Vessel Type	-	Vertical						
Volume Capacity	litr	3000	3500	4000	5000	6000	7000	10000
Vessel Water Pressure Drop	bar	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Connectoins Size								
Safety Valve	in	3/4	3/4	1	1	1	1	1
Pressure Indicator	in	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Drain	in	1	1	1	1 1/2	2	2	2
Level Gauge	in	1	1	1	1	1	1	1
Spare	in	1	1	1	1	1	1	1
Nitrogen Inlet	in	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Water Inlet & Outlet	in	2 1/2	2 1/2	2 1/2	3	3	3	4
Man Hole	in	14	14	16	16	16	16	16
Material								
Shell	-	Carbon Steel						
Toris Head	-	Carbon Steel						
Vessel Dimensions								
Vessel Diameter (D)	mm	1320	1320	1600	1600	1750	1750	1910
Vessel Height (H)	mm	2700	3000	2500	3000	3200	3450	4400

Horizontal Type



Model	Unit	PCET-300	PCET-400	PCET-800	PCET-1000	PCET-1500	PCET-2000
Technical Data							
Design Standard	-	ASME SEC. VIII. DIV.1					
Vessel Type	-	Horizontal					
Volume Capacity	litr	300	400	800	1000	1500	2000
Vessel Water Pressure Drop	bar	0.1	0.1	0.1	0.1	0.1	0.1
Connectoins Size							
Safety Valve	in	3/4	3/4	3/4	3/4	3/4	3/4
Pressure Indicator	in	1/2	1/2	1/2	1/2	1/2	1/2
Drain	in	1	1	1	1	1	1
Level Gauge	in	1	1	1	1	1	1
Spare	in	1/2	1/2	1/2	1/2	1	1
Nitrogen Inlet	in	1/2	1/2	1/2	1/2	1/2	1/2
Water Inlet & Outlet	in	1	1	1 1/2	1 1/2	1 1/2	2
Material							
Shell	-	Carbon Steel					
Toris Head	-	Carbon Steel					
Vessel Dimensions							
Vessel Diameter (D)	mm	600	600	800	900	1100	1200
Vessel Length (L)	mm	1350	1500	2000	2000	2000	2200



Model	Unit	PCET-2500	PCET-3000	PCET-4000	PCET-8000	PCET-9000	PCET-10000
Technical Data							
Design Standard	-	ASME SEC. VIII. DIV.1					
Vessel Type	-	Horizontal					
Volume Capacity	litr	2500	3000	4000	8000	9000	10000
Vessel Water Pressure Drop	bar	0.1	0.1	0.1	0.1	0.1	0.1
Connectoins Size							
Safety Valve	in	3/4	3/4	1	1	1	1
Pressure Indicator	in	1/2	1/2	1/2	1/2	1/2	1/2
Drain	in	1	1	2	2	2	2
Level Gauge	in	1	1	1	1	1	1
Spare	in	1	1	1	1	1	1
Nitrogen Inlet	in	1/2	1/2	1/2	1/2	1/2	1/2
Water Inlet & Outlet	in	2 1/2	2 1/2	3	3	3	3
Man	in	16	16	16	16	16	16
Material							
Shell	-	Carbon Steel					
Toris Head	-	Carbon Steel					
Vessel Dimensions							
Vessel Diameter(D)	mm	1320	1320	1600	1910	1910	1910
Vessel Length (L)	mm	2300	2700	2600	3300	3650	4100

PACKMAN GROUP
History

The Packman Company was founded in February 1975, and was soon afterwards registered in companies Registration Office. In early years the Packman construction and service branch focused on building installations. Different mega power plants were built by cooperating with Brown Boveri and Asseck companies in 1976.

The company started its official activities in construction of High-Pressure Vessels such as Hot-Water Boilers, Steam Boilers , Storage Tanks, Softeners and Heat Exchangers from 1984.

Packman Company is one of the first companies which supplied the high quality and standard hot water boilers to the customers.

Packman has exported its products to countries such as Uzbekistan, United Arab Emirates and other countries in the Middle East. It is one of the largest producers of hot-water and steam boilers in the Middle East.

Now we are proud to announce that the Packman industrial group has five major sub-brands that have product titles in all field of HVAC equipment and engineering services, and we do not know this success except with the help and support of our customers.

1. Construction Services Industry Association
2. Industry Association
3. Construction Companies' Syndicate
4. Technical Department Association
5. Mechanical Engineering Association
6. Engineering Standard Association

Departements:

Sales Deps:
- ∩ Power Plant & Petrochemical
- ∩ Industrial
- ∩ Hospitally Service
- ∩ Commercial & Residential
- ∩ Sport Complex & Pool

Technical Deps:
- ≡ Manufacturing R&D
- ≡ Innovation Center
- ≡ EPC Execute Unit
- ≡ Product Develop Unit
- ≡ Sales Engineering Dep.

Others:
- ≈ After Sales Service
- ≈ Project Control
- ≈ Financial Office
- ≈ Commercial Office
- ≈ Marketing Department

PACKMAN GROUP
Brands

PACKMAN
Industrial Group

Designer&manufacturer of Condensing, Hot Water, Steam, Hot Oil& Waste Heat Boilers, Heat Exchangers, Autoclave Pressure&Storage Vessels&etc

GREENMAN
Green mindset, green future

Engineering& Designing Commercial Greenhouse Plant, CO2 Dosing System, Flue gas Condenser& Special HVAC Systems, Sustainable Agriculture &etc

ROMAN
Water solution

Designer&manufacturer Reverse Osmosis Plant& Package, Water Treatment, Softener& Filters and Chemical Dosing Systems&etc

RAADMAN
a look to the future

Designer&manufacturer of Industrial Mono&Dual Block Gas, LPG, Light& Heavy Oil Burners, Premixed&Postmixed Burners, Water tube burners, Process burners, Special application burners&Combustion Solutions&etc

CHILLMAN
Coolest hvac around

Designer&manufacturer of Air&Water Cooled Chillers, Air Handling Units, Fancoil, HVAC Equipment, Cold Storage Room&etc


1. Isfahan Factory


2. Vilashahr Factory


3. Parand Factory


4. Parand (2) Factory


5. Bonyad Factory

SOME OF

Certificates are

Knowledge Based

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