
ORI®
a Composite Company

ORITANK
PRODUCT CATALOGUE

The ORI group was founded in 1983 and has since risen to become one of Asia's leading manufacturers and fabricatiors of corrosion resistant fiberglass products. With advanced facilities at several sites in Indonesia, the ORI group remains dedicated to being at the forefront in the world of Fiber Reinforced Plastics.

ORI Group offers an extensive range of Fiber Reinforced Plastic composite products incorporating many advantages compared to other alternative materials in terms of strength, durability, corrosion resistance, thermal insulation, weight, complexity and stringent quality control. The ability to deliver on spec, on time and on budget has positioned ORI Group as manufacturer, not only of the highest quality products, but also of top quality results.

About ORITANK

Application

Accessories

Tank Properties

Quality Control

Test Report

Handling & Storage

INTRODUCTION TO ORITANK

ORITANK provides services in engineering, manufacturing, design, and installation of tank products. For years we have produced horizontal and vertical tank types of standing position with standard volumes ranging from 1 to 100 cubic meters with a maximum 4,000 mm in diameter (a shop-fabricated tank). We can also customize based on customers' needs up to 3,000 cubic meters with maximum 25,000 mm in diameter (on-site hyper fabricated tank). The varieties of the composite tanks include septic tanks, water tanks, chemical tanks and special equipment such as scrubbers.

Tank Height

ORI standard manufacturing is 8,000 mm and we can make up to 16,000 mm. The height of scrubbers can be customized based on the customer's requirements.

Nominal Diameters

ORITANK size range is DN 500 mm to DN 15,000 mm.

Pressure Categories

Tanks and vessels are made atmospheric and suitable for their functions. Full vacuum series is also available for tanks process such as scrubbers.

SUPERIORITIES AND ADVANTAGES OF FRP/ GRP

Corrosive Resistant

FRP/ GRP has been the clear choice for corrosive environments for the past 50 years (can withstand environments such as extreme temperature, chemicals, etc). Given the temperature and chemical environment we can recommend the right materials for the most critical applications. Corrosion resistance is often the primary reason for choosing composites.

Durable And Cost Effective

High resistance to fatigue and requires minimal maintenance.

Non-conductive

Unlike metal products, FRP is not conductive to heat, sound, has no magnetic field and resists electrical sparks. It makes the work environment safer. Fibreglass can be made to be conductive for some applications.

Lightweight, High Strength, And Tough

Light weight means easier to handling and eliminates need for expensive handling equipment. In contrast to most metals, fibreglass does not change shape even when it is ruptured and can be designed to withstand impact.

MATERIAL USE

We use only the best materials from approved manufacturers.

Resin

Polyester (Orthophtalic, Isophthalic, Bhispenolic) and Vinylester (ASHLAND, AOC, SHCP, SHOWA).

Glass

E-Glass, C-Glass, ECR-Glass (Owens Corning, Nitttobo).

Hardener

Only approved catalysts are used in the manufacturing process (MEKP, BPO, CHP).

Additives

Additives are used as promoters and accelerators for the resin (DMA, Cobalt-napthenate 6%).

MANUFACTURING PROCESS

Tanks are produced using collaborative process of hand lay-up and continuous filament winding (helical horizontal and vertical) processes. In the hand lay-up method, the main part of the tank (the cylindrical portion) is made by hand coat resin on to the outer surface of a cylinder (called the mandrel) and then laying the reinforcements onto the resin.

The process involves winding filaments under varying amounts of tension over a mandrel. The mandrel rotates while a carriage moves horizontally, laying down fibers in the desired pattern. Once the mandrel is completely covered to the desired thickness and the resin has cured the mandrel is removed, leaving the hollow final product.

The filament winding and hand lay-up process that we use to manufacture our tanks proved to have an outstanding resistance and strength to many different chemicals. It also has an excellent resistance to impact and fatigue.

For manufacturing thermoplastic tanks such as PVC, CPVC, PP, PVDF, HDPE we are using an automatic thermoplastic machine for a more precision in the product dimension. The result will be better because the welding process is not done manually, the thermoplastic products can also be combined with lining FRP.

We are able to manufacture our tanks at your site/ project area (up to 3,000 cubic meter and with a height of up to 16,000 mm)

TANK COMPOSITION

FRP tanks generally have a resin-rich **inner layer** (called chemical barrier) at the inner-most layer of the tank. This layer gives high protection against chemical attack from the material being stored in the container.

The subsequent layers (called structural layers) are composed of glass-reinforced resin with compositions and characteristics dictated by the manufacturing method used to fabricate the tank. **External** resin-rich surface provides excellent Ultra-violet protection.

TEST

Quality of our tanks is ensured by checking & testing to the following standards:

Test Verification	Base Standard
Hydro test	ASME RTP -1 and BS 4994-1987

Specimen Test	Method
Tensile Strength and Modulus	ASTM D-638/ ASTM D-3939
Flexural Strength and Modulus	ASTM D-790
Glass Content	ASTM D-2564
Acetone sensitivity test	BS 4994-1987
Barcol hardness	ASTM D-2583

AREA OF USE

FRP provides fantastic chemical resistance in the highly corrosive industrial environment. Some of the most common areas where these tanks are used is shown below:

- Drinking water networks
- Tanks for storage or chemical process or industrial waste water management
- Tanks for oil and fuel storage
- Bio-septic tank

Bio-septic tank advantages: environmentally-friendly, leakage free, low maintenance, and disposal treatment system.

PRODUCT RANGE

Standard product is as follows (for customized products please contact us):

- FRP Tank
- PP Tank
- HDPE Tank black/ white
- PVC & CPVC Tank
- PVDF-FRP Tank
- Thermoplastic combines FRP (PVC+FRP, CPVC-FRP, PP+FRP)
- Scrubber (FRP, PVC+FRP, CPVC+FRP, PP, PP+FRP, PVDF+FRP)
- Ducting (FRP, PVC+FRP, CPVC+FRP, PP, PP+FRP, PVDF+FRP)

FLANGES AND MANHOLES

ORI standard are based on JIS, ANSI, DIN, AWWA. (We are also able to manufacture under other standards based on customer's requirements). ORI standard pressure range is 10 bar (above 10 bar is based on customer's requirements). Standard model is FF (Flat Face) and RF (Raised Face).

Manhole to ORI Standard Dimension is 500 mm – 600 mm (can be made based on customer's requirements)

Flanges

Manholes

COATING AND LINING

Coatings and lining are applied to improve exterior and interior surfaces of tanks, such as appearance, adhesion, corrosion resistance, and scratch resistance. Coating refers to restoration on the physical surface of the tank while flake lining refers to restoration in the interior structure (chemical layer) for steel or concrete. Flake lining can also be used in flooring (for chemical environments) and for FGD scrubbers.

Coating and lining in Tanks

Flake lining for flooring

HANDRAILS, PLATE FORMS, LUGS, AND LADDERS

Handrails and plate forms

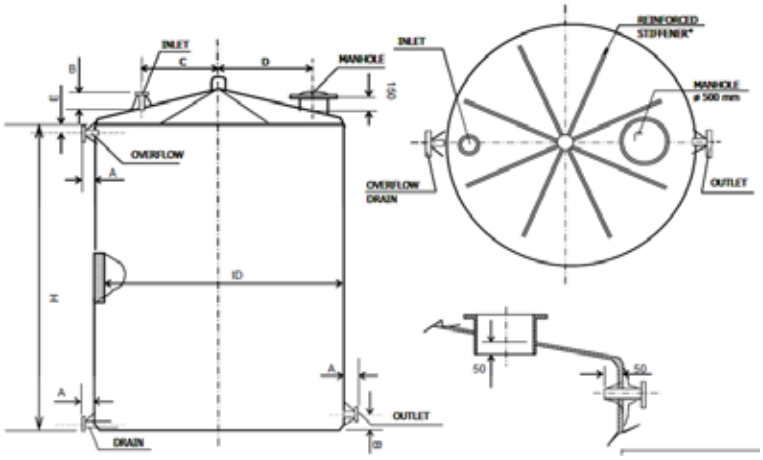
Lugs

Ladders

MECHANICAL PROPERTIES

Description	Unit	Value	
		FW	HLU
Axial tensile modulus	N/mm2	11,000-12,500	10,000-10,546
Hoop tensile m	N/mm2	22,000-25,000	10,000-10,546
Flexural modulus	N/mm2	-	11,250-13,025
Shear modulus	N/mm2	-	10,000-10,200
Ultimate axial tensile strength	N/mm2	127-135	167-220
Ultimate hoop tensile strength	N/mm2	272-280	167-220
Ultimate flexural strength	N/mm2	-	261-290
Ultimate shear strength	N/mm2	-	14-34
Glass content (%)		60-70	34-35

ORI TANK STANDARD - CONE



Standard ORI tank for dome (drawing and specification) is available based on request.

UNIT : mm

Type	ID	H	A	B	C	D	E	Thickness			DIA. NOZZLE	VENT. (min.)
								Roof	Shell	Bottom		
WST - 003	1,500	1,700	120	150	500	400	100	5	5	5	50	50
WST - 004	1,500	2,270	120	150	500	400	100	5	5	5	50	50
WST - 005	1,750	2,100	120	150	625	525	100	5	5	6	50	50

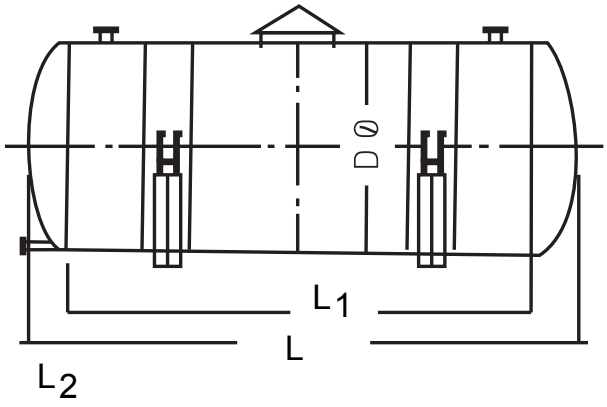
UNIT : mm

Type	ID	H	A	B	C	D	E	Thickness			DIA. NOZZLE	VENT. (min.)
								Roof	Shell	Bottom		
WST - 006	2,000	1,910	120	150	750	650	100	6	5	6.4	50	50
WST - 007	2,000	2,300	120	150	750	650	100	6	6	6.4	50	50
WST - 008	2,000	2,550	120	150	750	650	100	6	6	6.4	50	50
WST - 010	2,500	2,040	120	150	1,000	900	100	6	6.4	6.4	50	50
WST - 012.5	2,500	2,550	120	150	1,000	900	100	6	6.4	6.4	80	80
WST - 015	2,500	3,060	120	150	1,000	900	100	6	6.4	6.4	80	80
WST - 017.5	2,750	2,950	120	150	1,125	1,025	100	6.4	6.4	7	80	80
WST - 020	2,750	3,370	120	150	1,125	1,025	100	6.4	7	7	80	80
WST - 025	2,750	4,210	120	150	1,125	1,025	100	6.4	7.5	7	80	80
WST - 030	3,000	4,250	120	150	1,250	1,150	100	7	6 / 7.5	8	80	80
WST - 035	3,000	4,960	120	150	1,250	1,150	100	7	6 / 8	8	80	80
WST - 040	3,000	5,700	120	150	1,250	1,150	100	7	6 / 8 / 9	9	80	80
WST - 050	3,000	7,150	120	150	1,250	1150	100	7	6 / 8 / 10	10	80	80
WST - 100	4,000	8,000	120	150	1,750	1,650	100	8	8 / 10 / 12	12	100	100

Note :

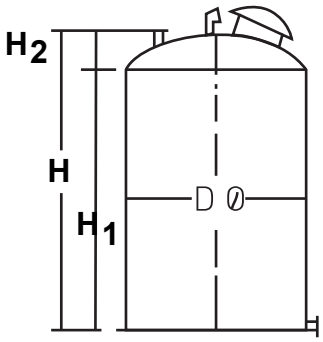
Gusset provided for at least Ø 3", min 4 nos
*) 4 nos for 1,500 mm and dia 1,750 mm, 6 nos for dia 2,000 mm and 2,500 mm, 8 nos for greater than 2,750 mm
Depth of root according to ORI Standard
Material resin is Orthophtalic grade, liner to be optically transparent gelcoat while the outer color is blue.
Bottom radius min 100 mm

HORIZONTAL TANK STANDARD



Vul	D Ø (mm)	L (mm)	L_1 (mm)	L_2 (mm)
1 m^3	1,000	1,695	1,276	210
2 m^3	1,250	2,150	1,630	260
2 m^3	1,500	1,752	1,132	310
3 m^3	1,500	2,320	1,700	310
4 m^3	1,500	2,890	2,270	310
5 m^3	1,500	3450	2,830	310
5 m^3	1,750	2,800	2,000	360
8 m^3	1,750	4,040	3,320	360
10 m^3	1,750	4,870	4,150	360
10 m^3	2,000	4,000	3,280	410
15 m^3	2,000	5,590	4,770	410
15 m^3	2,500	4,030	3,060	485
20 m^3	2,500	5,050	4,080	485
25 m^3	3,000	4,670	4,550	560
30 m^3	3,000	5,360	4,240	560

VERTICALTANK STANDARD



Vul	D Ø (mm)	H (mm)	H_1 (mm)	H_2 (mm)
1 m^3	1,000	1,510	1,300	210
2 m^3	1,250	1,890	1,630	260
2 m^3	1,500	1,442	1,132	310
3 m^3	1,500	1,980	1,670	310
4 m^3	1,500	2,575	2,265	310
4 m^3	1,500	2,025	1,665	360
5 m^3	1,750	3,140	2,830	310
5 m^3	1,750	2,440	2,080	360
8 m^3	1,750	3,690	3,330	360
8 m^3	2,000	2,960	2,550	410
10 m^3	2,000	3,595	3,185	410
10 m^3	2,500	2,525	2,040	485
15 m^3	2,500	3,550	3,085	485
15 m^3	3,000	2,000	2,120	600
30 m^3	3,000	2,290	2,920	600
30 m^3	3,000	4,810	4,250	560
40 m^3	3,500	4,795	4,160	635
50 m^3	3,500	5,835	5,200	635
60 m^3	3,500	6,885	6,250	635
60 m^3	4,000	5,485	4,775	710
70 m^3	4,000	6,279	5,569	710
80 m^3	4,000	7,075	6,355	710
80 m^3	4,000	7,870	7,160	710
100 m^3	4,000	8,665	7,955	710
120 m^3	4,000	1,0255	9,545	710

We really care about the quality of our products, and we have facilities to ensure it.

Tests	Standard	Frequency
Inspection of Resin	ORI's In-house Standard	Every Batch
Inspection of Hardener	ORI's In-house Standard	Every Batch
Inspection of Continuous Roving	ORI's In-house Standard	Every Batch
Calibration	ORI's In-house Standard	Calibration every 3 to 6 months
Visual Control	ASTM D2563	100%
Dimensional Control	ASTM D3567	100%
Barcol Hardness	ASTM D2583	100%
In-process Control	ORI's In-house Standard	100%
Axial / Hoop Tensile Strength	ASTM D 638	As per customer's requirement

TEST REPORT

Tension test report is available based on customer's request.

HANDLING

- FRP tanks should be handled with care and protected from impact. Throwing, dropping, bumping or hitting the FRP Tanks is prohibited. FRP Tank shall not be dragged or pushed over sharp objects that may scratch or damage the tanks.
- The use of forklift truck can be permitted as long as the forks are padded with adequate cushion material such as rubber sheet, canvas etc. in order to prevent damage to the Tank.
- During Transportation, do not let the FRP Tank rest on floor of the container where nails, studs or other sharp objects might damage it.
- Do not drop the FRP product, walk or stand on it.
- The FRP tanks shall be securely fastened directly over the timbers with tie-downs such as steel slings with PE protective hose cover (as applicable)
- No foreign materials shall be loaded in the FRP Tank or on the top of Tanks that will damage the Tank.
- When stacking 12 m length, a minimum of 4 wooden supports must be used to separate each length.
- Do not allow the FRP Tanks to extend more than 2 meters beyond the truck or trailer bed to prevent excessive bowing.

STORAGE

- During storage, supports shall be spaced at 3 meters intervals and approximately not more than 1.5 meters from each end. The supports should have a minimum 100 mm wide bearing surface.
- The supports (timbers) used in the container can be used for this purpose at the storage area.
- The stack of tanks should not exceed 3m height and should have side supports or blocks to prevent rolling or slipping of the stack.
- It is not recommended to stack tanks directly on the ground.