Sesinoks

GRP

SECTIONAL WATER TANKS

About

Esinoks was established in 2003, is manufacturer of sectional water storage tanks. The factory is located in Gebze-Kocaeli. Esinoks is an engineering company and approching every project as a customer specific requirement. High technology usage throughout the manufacturing process is inevitable for Esinoks since we target to keep our products at and beyond global standards.

The challenges the world faces in addressing water availability are enomous with significant social, economic and environmental implications. Ensuring a sufficient and constant supply of water through effective water management, storage and distribution is essential in security a safe, healthy, prosperous and sustainable world.

Customer focus is a recognised value. It' s not aspirational, it is real and every member of the team understands its meaning and more importantly, how they can positively influence it. Customer focus is an attitude which permeats the organisation.

Esinoks Team concept operates to a set of core value and standards that reinforce The company' s costumer promise and ensure all team members understand how important their contribution is.

What is GRP (Glass Reinforced Polyester)?

Esinoks GRP panels are hot press moulded in glass reinforced polyester resins and glassfiber reinforcemet. This panels are designed and manufactured according to BSEN 13280 standards, certified by WRAS certification.

The panels are molded at temperature up tp 150°C under strict control disciplines. The process results in strong, consistent panels which are fully cured, dimensionally accurate with sharply defined profiles and smooth surfaces on both faces.

Drilling and finishing of the panels is undetaken in a purpose built controlled area, where high technology automated drilling equipment is used to complete production to exacting tolerance levels.

COMPARISON: Esinoks GRP Panel Tanks vs Other Tank Types

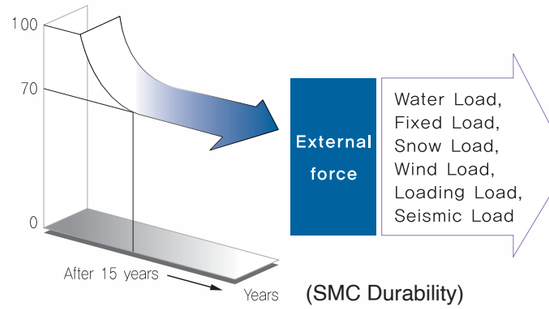
	Water quality	Water tightness	Durability	Transportation	Maintance	Anti-corrosion	Installation
Esinoks GRP Tank	◎	◎	○	◎	◎	◎	◎
Concrete Tank	X	△	△	X	X	◎	△
Steel Tank	△	◎	○	△	X	X	X
Stainless Steel Tank	◎	◎	○	△	△	△	X
GRP Hand Lay-up Tank	△	◎	○	X	△	◎	○

◎ : Very Good ○ :Good △ :Normal X :Poor

Structural Analysis

Design Basis: External Force < Maximum Feature / Safety Factor

ITEM	Design Condition
Seismic Load	Horizontal Seismic Kh=2/3 Vertical Kv=1/3 Designed Bases on Kh=1/3G , Horizontal Seismic Load
Hydrostatic Pressure	Water Level [Height in Meters] x 1,1KGF/cm² [0,01MPa] Designed to stand aganist hydrostatic pressure enough the max, change of side wall is less than 1,0% of total heigh left in Water for 48 hours.
Snow Load	60 KGF/m² [at the base of 30 cm of snow depth] Designed to stand under 200kg/m² enough.
Wind Load	Wind Load - 255 KGF/m² [2,55 x 10-3 MPa] Designed to stand under max. 60 m/sec even in case tank does not include water.
Opacity	Under 1,1%
Water Temperature	Under 30°C (normal) / Under 50°C (maximum) (Special making in case of thermal spring)



(SMC Durability)

Structural Design of GRP Wall Panel (1m x 1m)

Physical Property

ITEM	VALUE
Tensile Strength	105 - 85 MPa
Flexural Strength	200 - 170 MPa
Impact Strength	Kg/cm² 75
Compressive Strength	205-210 MPa
In Plane Shear	Kg/cm² 800
Flexural Modulus of Elasticity	10500- 8500 MPa
Barcol Hardness	40 - 50
Absorption Rate	Less than 0,1 %
Glass Fiber Content	30 %
Odor & Taste	No Defects
Light Transmission	Nil
Heavy Metals	Not Defected
Consumption of KMno4	0,3 mg/L
PH (20)	6,9
Phenol	Not Defected
Cavity	Less than 2%
Ultra-Violet Rays	Non

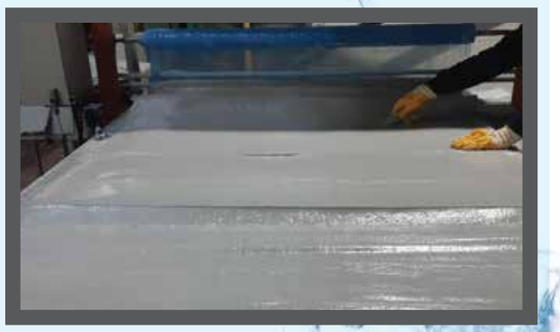
Hydrostatic Pressure Test Unit

Test for Panel Transformation

Test for Hydraulic pressure

Production

01
Cutting SMC Sheets



02
GRP Hot Press Molding

07
Installed GRP Water Tank

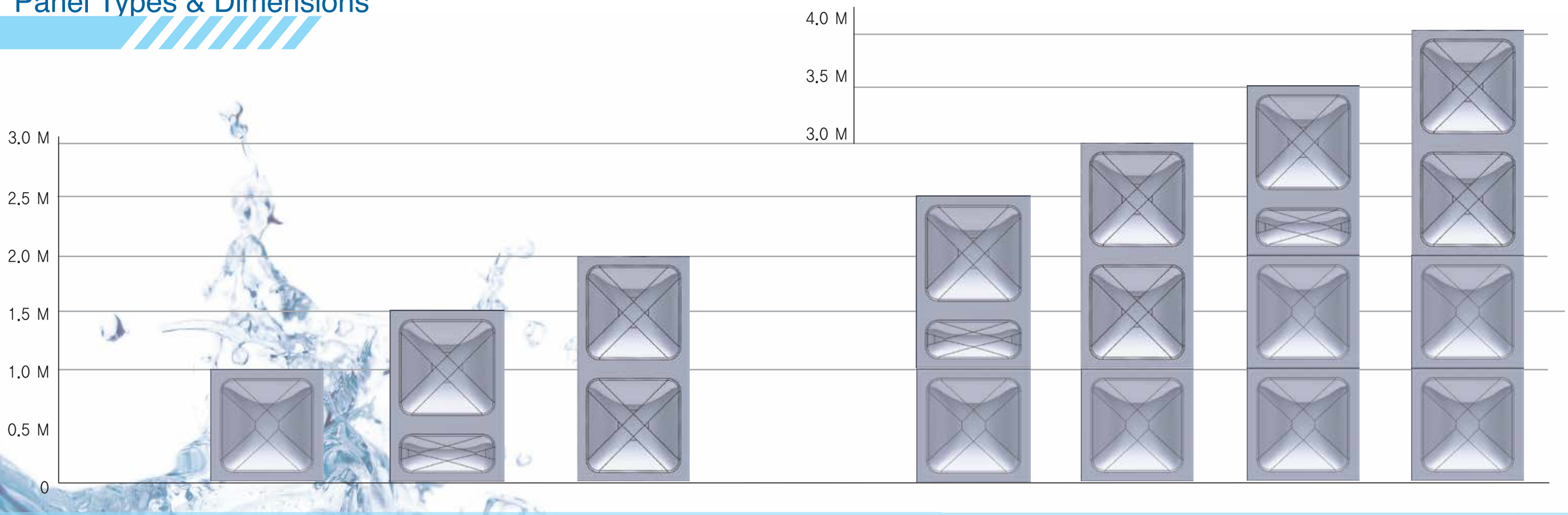
03
Controlled and Approved Panels

04
Drilling with Robotic System

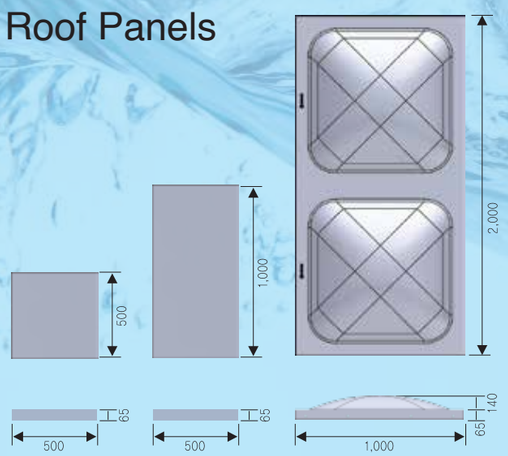
05
Steel Skid Installation on Concrete Base

06
Installation

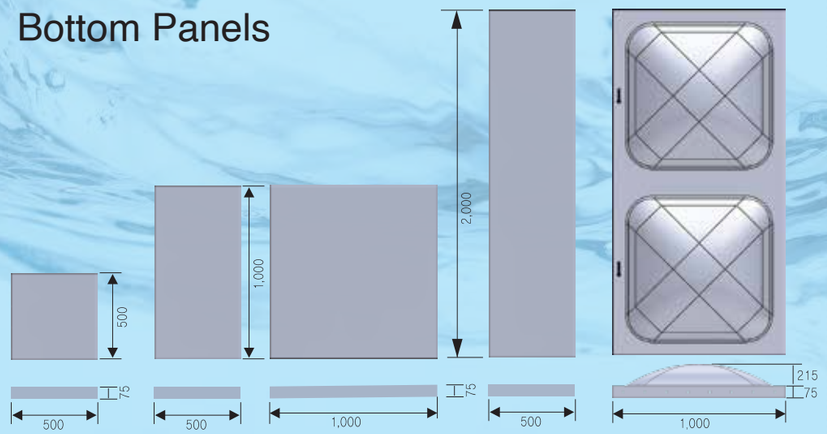
Panel Types & Dimensions



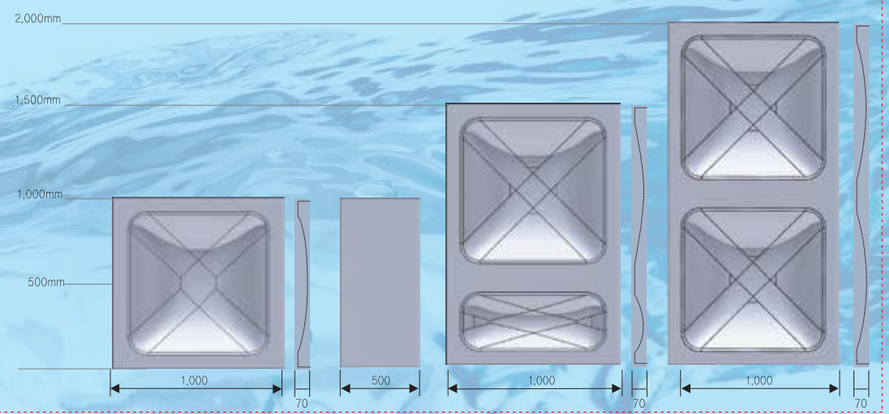
Roof Panels



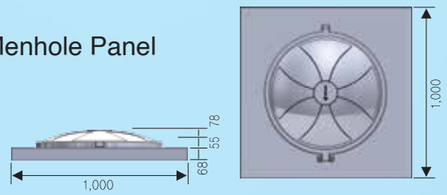
Bottom Panels



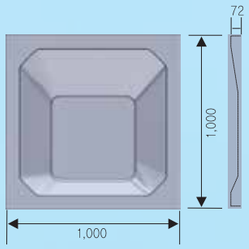
Wall Panels



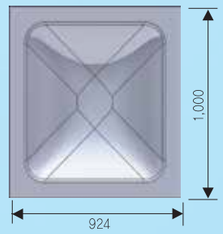
Menhole Panel



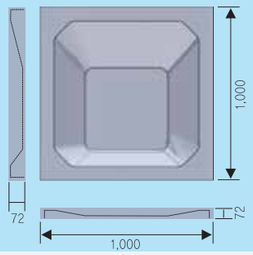
Drain Panel



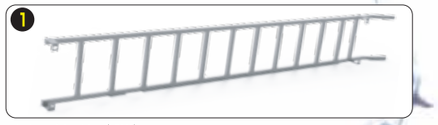
Partition Panel



Flange Panel



External Flange Base Design

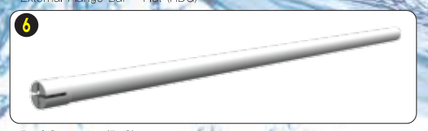

1 External Ladder (HDG)


2 Internal Ladder (GRP)

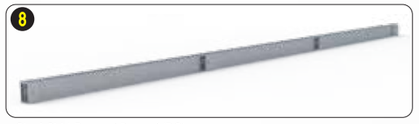

3 Corner Frame (HDG)


4 External Flange Bar – Angle (HDG)


5 External Flange Bar – Flat (HDG)

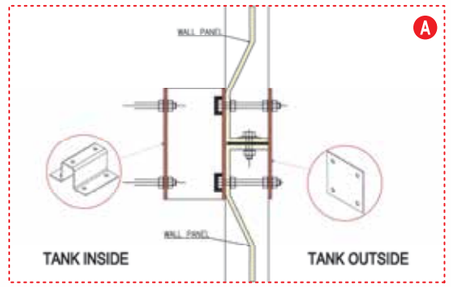

6 Roof Support (PVC)

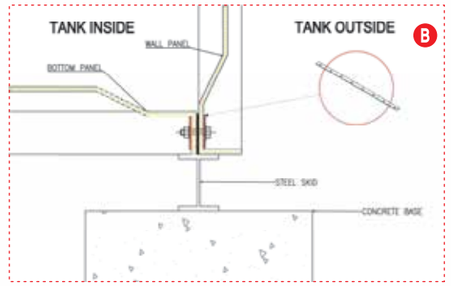

7 Tie Rod

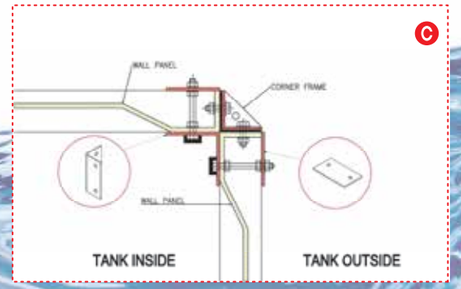

8 Steel Skid Base – I Beam (HDG)

15 Manhole (Ø720)

16 Air Vent








9 Internal Bracket for Tie Rod


10 Internal Bracket for Tie Rod

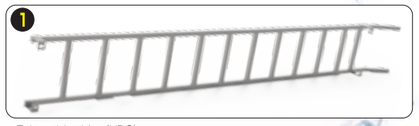
11 Internal / External Bracket

12 Internal / External Bracket


13 Anchor Bracket

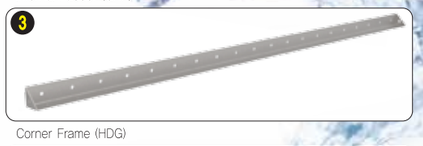

14 Flat Flange

Internal Flange Base Design

1

External Ladder (HDG)

2

Internal Ladder (GRP)

3

Corner Frame (HDG)

4

External Flange Bar – Angle (HDG)

5

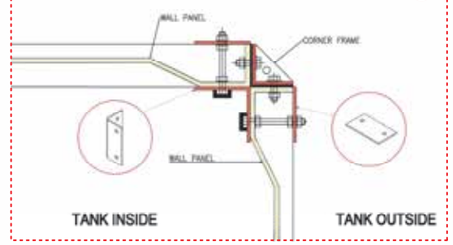
External Flange Bar – Flat (HDG)

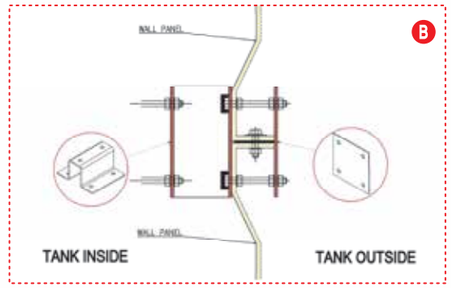
6

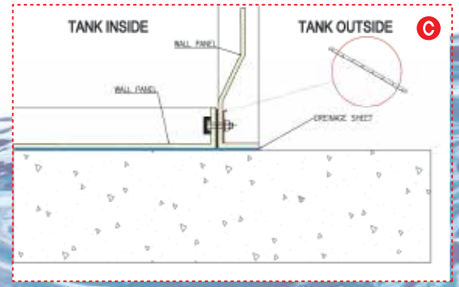
Roof Support (PVC)

7

Tie Rod

A


B


C


8

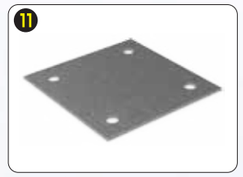
Internal Bracket for Tie Rod

9

Internal Bracket for Tie Rod

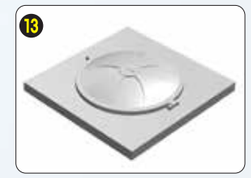
10

Internal / External Bracket

11

Internal / External Bracket

12

Flat Flange

13

Manhole (Ø720)

14

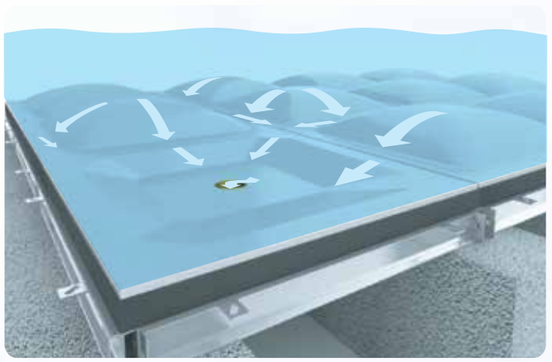
Air Vent

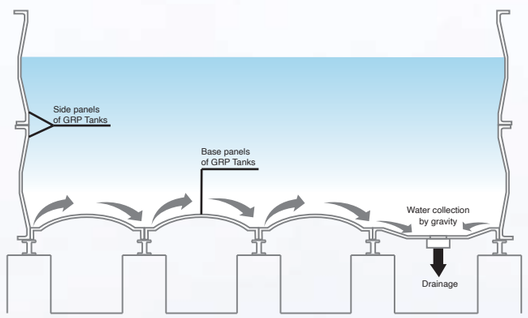
Various Geometric Tank Shapes are Available

It is possible to design GRP Sectional Water Storage Tanks in various geometric forms such as “L”, “T”, “U” or “Center column Inside the Tank” shapes.
GRP Water Storage Tanks can be designed as to be installed concrete columns inside in case of necessity.

Full Drainage

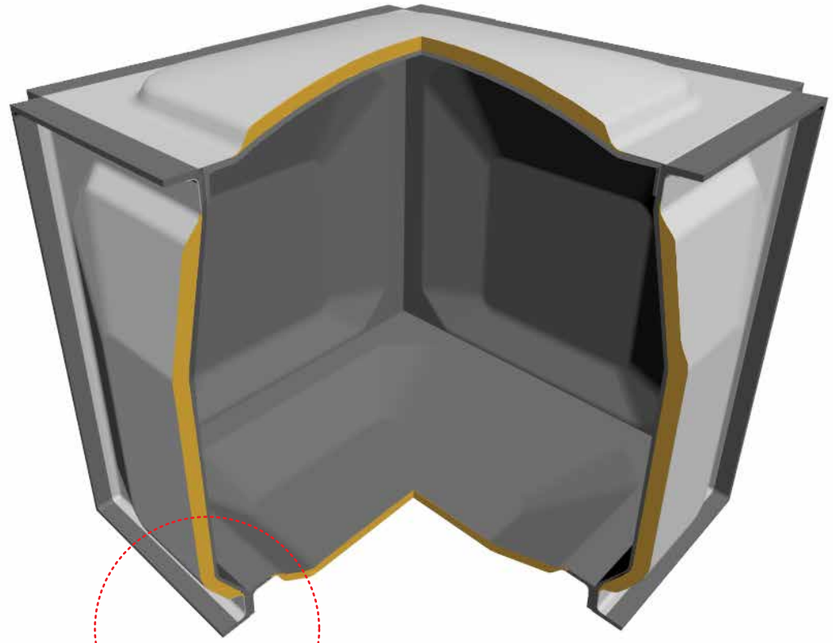
The convex bottom panels with a concave drain panel allows full and fast drainage.
Cleaning and maintenance of tanks become very easy.

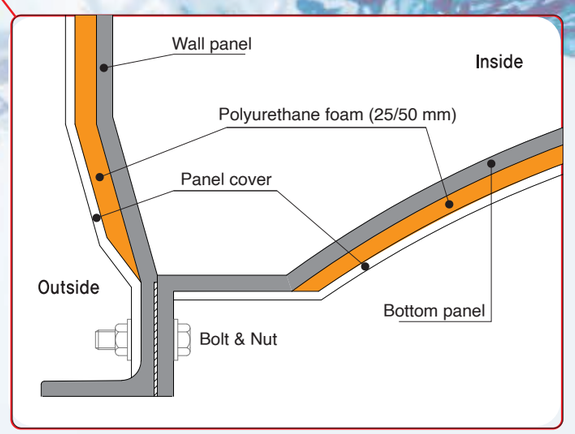




Termal Insulation

Surface of GRP panels can be insulated by polyurethane coating as an option.
Insulation material doesn’t contain neither CFC nor HCFC.
Insulation thickness could be 25mm or 50mm as two options.





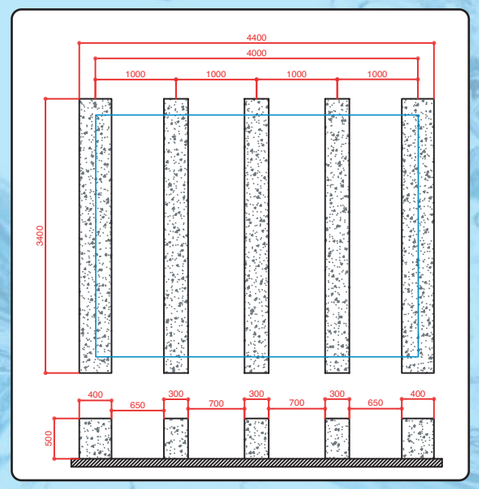
Comparison of Thermal Conductivity

Tank type	Thermal Conductivity Kcal / m.hr℃ (j / m hr℃)
STEEL	37.0 (1.55 X 100,000)
GRP (Non-insulated)	0.15 (630)
GRP (Insulated)	0.02 (84)

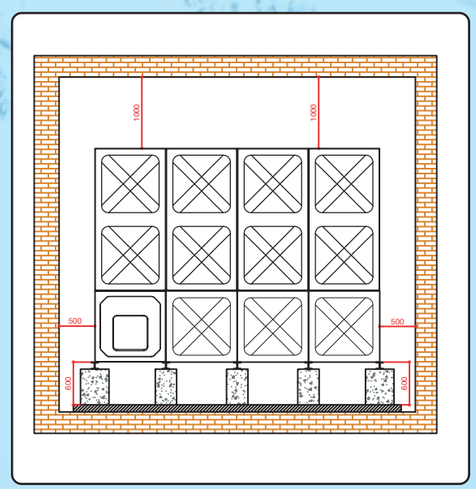
Tank type	Coefficient of Overall Thermal Transmission Kcal / ㎡.hr℃ (j / ㎡ hr℃)	
	Air – Panel – Air	Water –Panel –Air
STEEL	14.3 (59.9)	24 (100)
GRP (Non-insulated)	3.0 (13)	5 (21)
GRP (Insulated)	0.9 (3.8)	1 (4)

Concrete Base Foundation

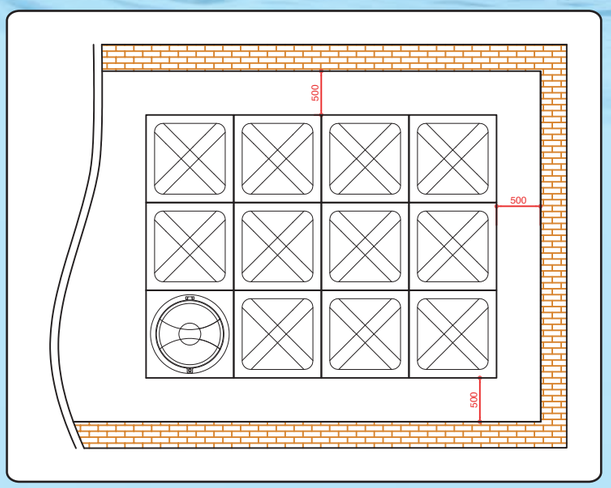
- The concrete foundation should be constructed according to the designated water tank specification.
- The strength of the concrete foundation should be at least 180 kgf/cm².



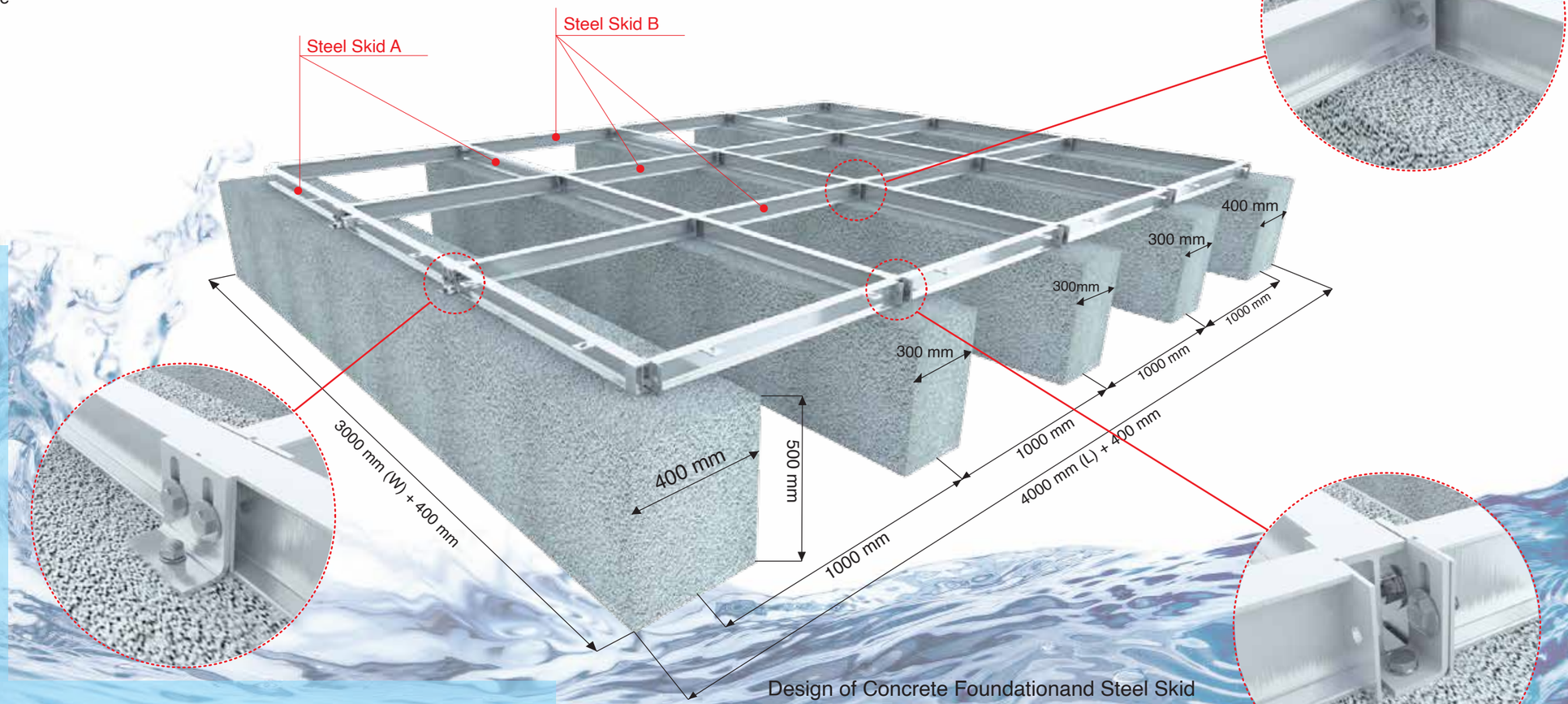
Cocrete base foundation for (W)3m x (D)4m



Front view for installation space



Plan view for installation space



Design of Concrete Foundationand Steel Skid
(E.g. Tank Sizes: 3m(W) x 4m(L) x 3m(H))

◆ Steel Skid Types

Type	Size	Steel Skid A(Main)	Size	Steel Skid B(Sub)
NPI 80	500 1000 2000		450 950	
	500 K 1000 K 2000 K		450 K 950 K	

- The steel skid could be designed according to customer's requirements.

Specification of Nozzles

1) Specification of Nozzles

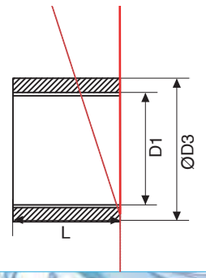
- All nozzles could be supplied according to customer's requirements.
- Recommended fittings are listed below.

Recommended Connection Size

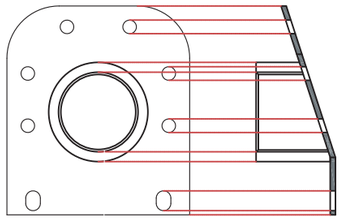
Water Tank Capacity(m³)	Inlet	Outlet	Overflow	Drain
1m³ ~ 10m³	DN25	DN50	DN50	DN25
1m³ ~ 20m³	DN40	DN50	DN50	DN40
1m³ ~ 50m³	DN50	DN65	DN65	DN40
1m³ ~ 100m³	DN65	DN80	DN80	DN50
1m³ ~ 200m³	DN80	DN100	DN100	DN50
1m³ ~ 500m³	DN100	DN125	DN125	DN80
501m³ ~	DN125	DN150	DN150	DN80

2) Socket Size

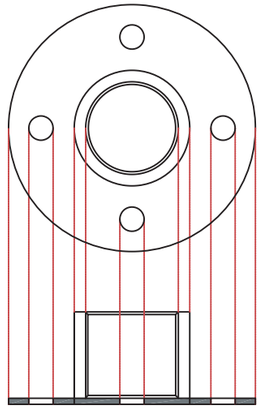
BSP - DIN 2999	1"	1 ¼"	1 ½"	2"	2 ½"	3"
D1	1"	1 ¼"	1 ½"	2"	2 ½"	3"
D3	39,5	48,5	54,5	66,5	82,0	95,0
L	43,0	48,0	48,0	56,0	65,0	71,0
Kg	0,145	0,204	0,242	0,35	0,506	0,676



Wall Panel Socket



Drain Panel Socket



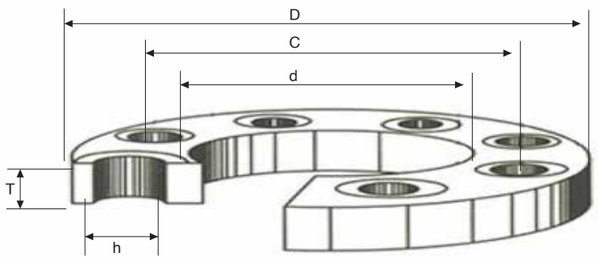
3) Flange Types and Properties (TS EN 1092)

PN10

DN	d	D	T	C	N	Vida	h
15	22	95	14	65	4	M12	14
20	27,5	105	16	75	4	M12	14
25	34,5	115	16	85	4	M12	14
32	43,5	140	18	100	4	M16	18
40	49,5	150	18	110	4	M16	18
50	61,5	165	19	125	4	M16	18
65	77,5	185	20	145	8	M16	18
80	90,5	200	20	160	8	M16	18
100	116	220	22	180	8	M16	18
125	141,5	150	22	210	8	M16	18
150	170,5	285	24	240	8	M20	22
200	221,5	340	24	295	8	M20	22
250	276,5	395	26	350	12	M20	22
300	327,5	445	26	400	12	M20	22

PN16

DN	d	D	T	C	N	Vida	h
15	22	95	14	65	4	M12	14
20	27,5	105	16	75	4	M12	14
25	34,5	115	16	85	4	M12	14
32	43,5	140	18	100	4	M16	18
40	49,5	150	18	110	4	M16	18
50	61,5	165	20	125	4	M16	18
65	77,5	185	22	145	8	M16	18
80	90,5	200	24	160	8	M16	18
100	116	235	26	190	8	M20	22
125	141,5	270	28	220	8	M24	26
150	170,5	300	30	250	8	M24	26
200	221,5	360	32	310	12	M24	26
250	276,5	425	35	370	12	M27	30
300	327,5	485	38	430	16	M27	30

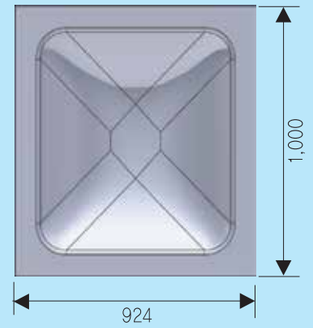


Partition Panel

GRP Tanks could be designed to have more than one compartment.

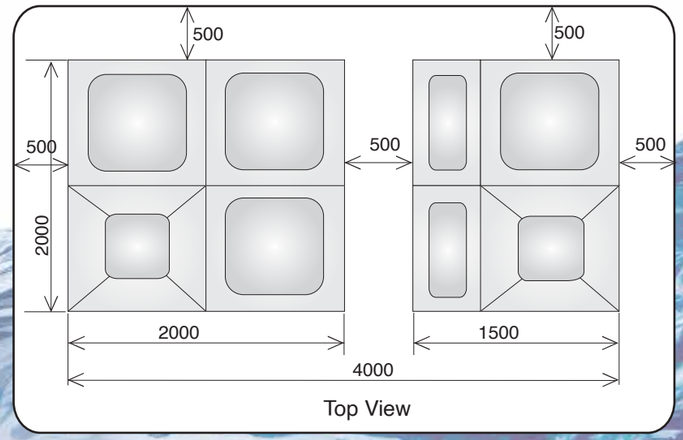
Tanks could be divided into two or more compartments.

Partition Type Panel



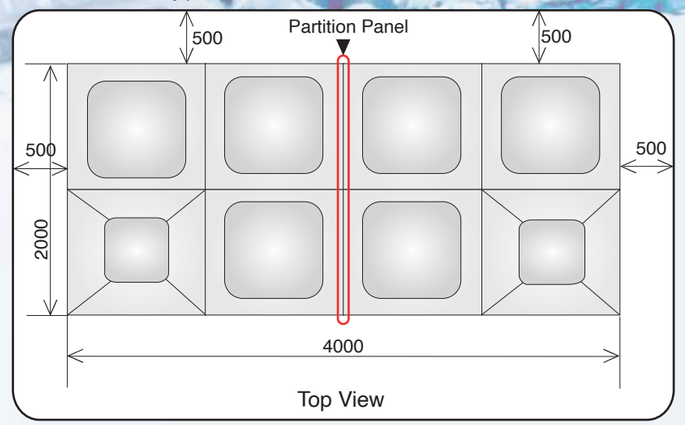
Two Sperate Tanks

2m(W) x 2m(L) x 2m(H) = 8 tons
2m(W) x 1.5m(L) x 2m(H) = 6 tons
-Totals 14 tons by seperated 2 water tanks

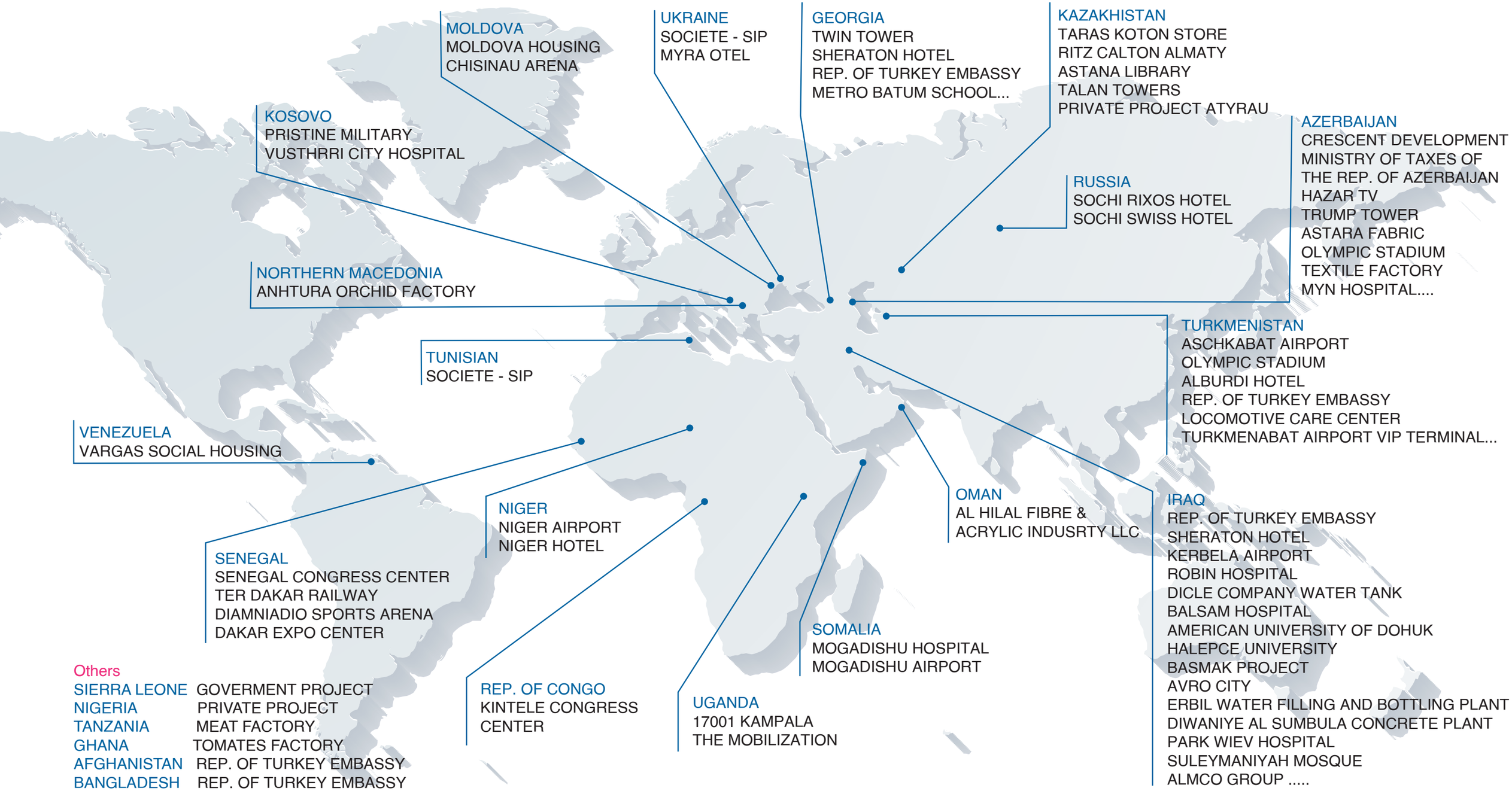


One Tank with Two Compartments

2m(W) x 2m(L) x 2m(H)+2m(W) x 2m(L) x 2m(H) = 16 tons
-Totals 16 tons by partition water tanks



International Case Studies



MOLDOVA
MOLDOVA HOUSING
CHISINAU ARENA

UKRAINE
SOCIETE - SIP
MYRA OTEL

GEORGIA
TWIN TOWER
SHERATON HOTEL
REP. OF TURKEY EMBASSY
METRO BATUM SCHOOL...

KAZAKHISTAN
TARAS KOTON STORE
RITZ CALTON ALMATY
ASTANA LIBRARY
TALAN TOWERS
PRIVATE PROJECT ATYRAU

KOSOVO
PRISTINE MILITARY
VUSTHRRI CITY HOSPITAL

RUSSIA
SOCHI RIXOS HOTEL
SOCHI SWISS HOTEL

AZERBAIJAN
CRESCENT DEVELOPMENT
MINISTRY OF TAXES OF
THE REP. OF AZERBAIJAN
HAZAR TV
TRUMP TOWER
ASTARA FABRIC
OLYMPIC STADIUM
TEXTILE FACTORY
MYN HOSPITAL....

NORTHERN MACEDONIA
ANHTURA ORCHID FACTORY

TUNISIAN
SOCIETE - SIP

TURKMENISTAN
ASCHKABAT AIRPORT
OLYMPIC STADIUM
ALBURDI HOTEL
REP. OF TURKEY EMBASSY
LOCOMOTIVE CARE CENTER
TURKMENABAT AIRPORT VIP TERMINAL...

VENEZUELA
VARGAS SOCIAL HOUSING

NIGER
NIGER AIRPORT
NIGER HOTEL

OMAN
AL HILAL FIBRE &
ACRYLIC INDUSRTY LLC

IRAQ
REP. OF TURKEY EMBASSY
SHERATON HOTEL
KERBELA AIRPORT
ROBIN HOSPITAL
DICLE COMPANY WATER TANK
BALSAM HOSPITAL
AMERICAN UNIVERSITY OF DOHUK
HALEPCE UNIVERSITY
BASMAK PROJECT
AVRO CITY
ERBIL WATER FILLING AND BOTTLING PLANT
DIWANIYE AL SUMBULA CONCRETE PLANT
PARK WIEV HOSPITAL
SULEYMANIYAH MOSQUE
ALMCO GROUP .....

SENEGAL
SENEGAL CONGRESS CENTER
TER DAKAR RAILWAY
DIAMNIADIO SPORTS ARENA
DAKAR EXPO CENTER

SOMALIA
MOGADISHU HOSPITAL
MOGADISHU AIRPORT

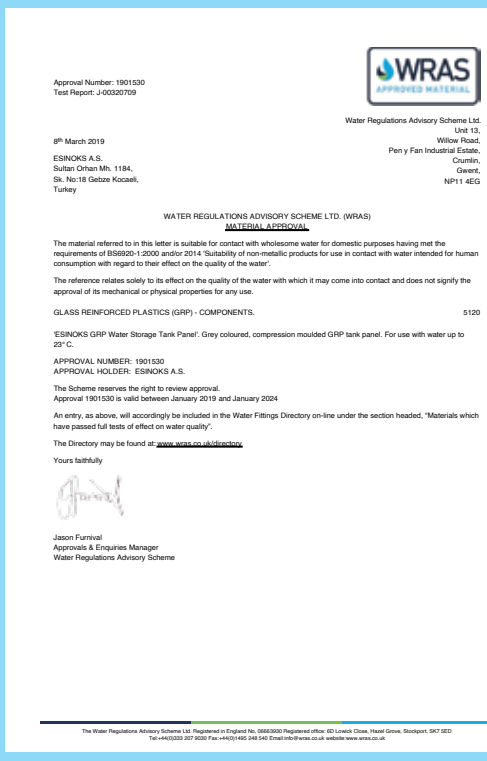
REP. OF CONGO
KINTELE CONGRESS
CENTER

UGANDA
17001 KAMPALA
THE MOBILIZATION

Others

SIERRA LEONE	GOVERMENT PROJECT
NIGERIA	PRIVATE PROJECT
TANZANIA	MEAT FACTORY
GHANA	TOMATES FACTORY
AFGHANISTAN	REP. OF TURKEY EMBASSY
BANGLADESH	REP. OF TURKEY EMBASSY
CAMEROON	JAPOMA SPORT COMPLEX
N. CYPRUS	S.H. RADAR BUILDING
ARMENIA	PRIVATE HOUSE MR. ARA YACOUBIAN
JORDAN	BIOTECHNOLOGY AND CANCER INSTITUTE HOSPITAL
KYRGYZISTAN	BISHKEK MOSQUE
NAKHCHIVAN	REP. OF TURKEY EMBASSY
SUDAN	BUSINESS CENTER

Quality Certificates



Approval Number: 1901530
Test Report: J-00320709

8th March 2019

ESINOKS A.S.
Sultan Orhan Mh. 1184,
Sk. No:18 Gebze Kocaeli,
Turkey

Water Regulations Advisory Scheme Ltd.
Unit 13,
Willow Road,
Pen y Fan Industrial Estate,
Crumlin,
Gwent,
NP11 4EG

WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)
MATERIAL APPROVAL

The material referred to in this letter is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6920-1:2000 and/or 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'.

The reference relates solely to its effect on the quality of the water with which it may come into contact and does not signify the approval of its mechanical or physical properties for any use.

GLASS REINFORCED PLASTICS (GRP) - COMPONENTS. 5120

'ESINOKS GRP Water Storage Tank Panel'. Grey coloured, compression moulded GRP tank panel. For use with water up to 23° C.

APPROVAL NUMBER: 1901530
APPROVAL HOLDER: ESINOKS A.S.

The Scheme reserves the right to review approval.
Approval 1901530 is valid between January 2019 and January 2024

An entry, as above, will accordingly be included in the Water Fittings Directory on-line under the section headed, "Materials which have passed full tests of effect on water quality".

The Directory may be found at: www.wras.co.uk/directory

Yours faithfully

Jason Furnival
Approvals & Enquiries Manager
Water Regulations Advisory Scheme

TÜRK STANDARDLARI ENSTİTÜSÜ

HİZMET YETERLİLİK BELGESİ

SERTİFİKA • CERTIFICATE • ZERTIFIKAT • CERTIFICAT

ASCERT Certification

CERTIFICATE

This certificate is granted to the organization,

ESINOKS MUHENDISLIK MAKINA INSAAT PETROL URUNLERI IMALAT SANAYI VE TICARET ANONIM SIRKETI

Sultan Orhan 1194 No: 18 Gebze, Kocaeli, TURKEY

Production and Sales of Metal and Composit Modular Water Tanks

IAF/EA Code: 17
according to the scope,

ISO 9001:2015

to certify that quality management system in accordance with standard's clauses is established and being implemented.

Date of first issue : 05.07.2021
Date of issue : 05.07.2021
Certificate period : 3 years
Release date : 04.07.2023
Certificate No : KQ.2021.173.1

IAF IAS

Ascert Certification
System Certificate Approved

TÜRK STANDARDLARI ENSTİTÜSÜ
TÜRK STANDARDLARINA UYGUNLUK BELGESİ
TURKISH STANDARDS INSTITUTION
CERTIFICATE OF CONFORMITY TO TURKISH STANDARDS

TSE

esinoks

GEBZE FACTORY

Sultan Orhan Mah. 1184 Sok.
No: 18 (TEM Otoyolu üzeri
Gebze Mevkii) 41400
Gebze / Kocaeli / TURKEY

ANKARA BRANCH OFFICE

Hilal Mah. 696 Sok.
No: 13 6550
Yıldız / Çankaya
ANKARA / TURKEY

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esinoks@esinoks.com.tr
export@esinoks.com.tr

Esinoks Mühendislik A.Ş.

esinoksmodulersudeposu