SUNNIK®

MODULAR STAINLESS STEEL GRADE 304/444/316(L) PANEL TANK

Durable and hygienic water storage that's corrosion resistant, easy to assemble and low maintenance






SUNNIK: THE ULTIMATE IN RELIABLE WATER CONTAINMENT SINCE 1984

Since 1984, Sunnik has provided best-in-class water containment systems for projects around the world, from high-tech skyscrapers like Burj Khalifa and the Petronas Twin Towers to the most basic domestic water storage in Berekum, Ghana.

Today, we're a global leader in water containment worldwide, with our tanks in use in over 42 countries.

Sunnik's mission is to be the most reliable name in water storage solutions. We strive to provide the most hygienic, cost-effective, easy-to-install, and durable water tanks available.

Winners of the 2013 Malaysian Construction Industry Excellence Award and Sunnik was selected among the 500 companies under the Malaysia Prime Minister's Tun Dr Mahathr Mohamad Industry 4.0 (Industry 4WWRD) 2019 program. We've had the honour of partnering to supply water storage infrastructure for some of the world's most prestigious developments, including Burj Khalifa, the Petronas Twin Towers, Hong Kong's Chep Lap Kok International Airport, and Kuala Lumpur International Airport. With accreditation from a growing number of regulatory organizations, we aim to meet the highest international quality standards.

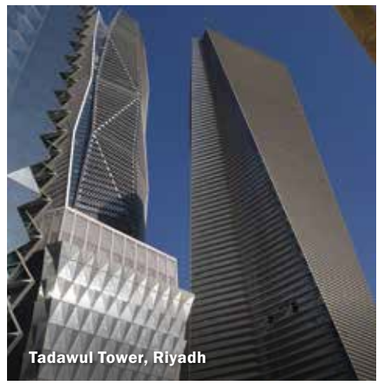
Addressing environmental impacts is also a top priority.We seek ways to advance the future of water storage while protecting natural resources and maximizing the sustainability of our processes and products.

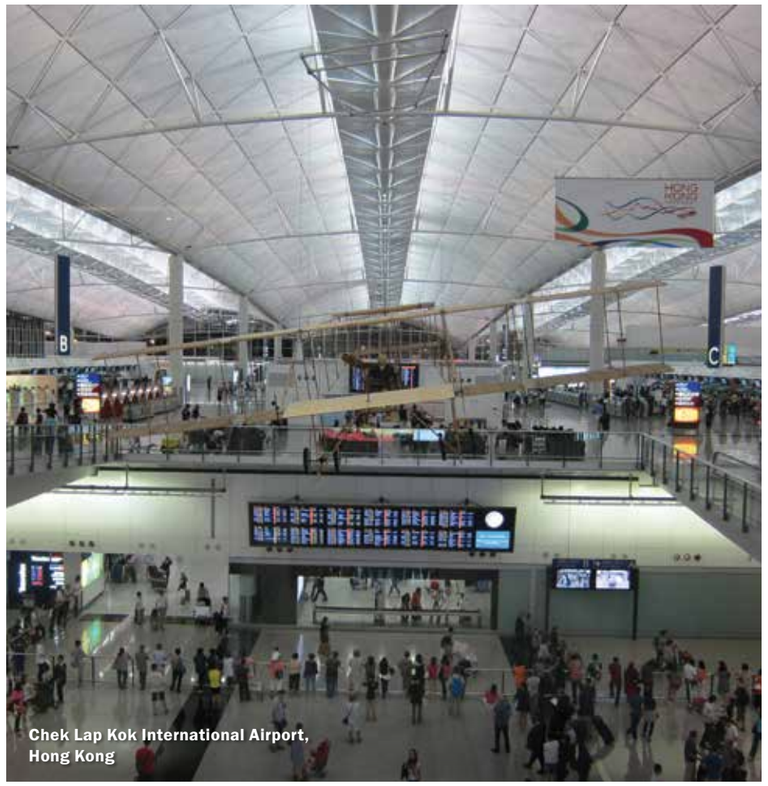
We use cutting-edge techniques to design, develop, and construct our water storage solutions – including the application of robotic welding, fibre-laser cutting, hydraulic hot-pressed compression from 600 to 1500 metric tons, sheet moulding compound (SMC), and other automated processes that enhance quality and reduce product costs. Seeking out and adopting the newest production technologies is just part of what Sunnik does to ensure the quality of every water storage tank panel we make is unsurpassed.

TRACK RECORD

When it comes to water containment technology, we're continually raising the bar. Because where there's quality water for the people, there's Sunnik.


Chakri Palace, Bangkok


Tadawul Tower, Riyadh



Chek Lap Kok International Airport, Hong Kong


Berekum, Ghana

Burj Khalifa, Dubai


Petronas Twin Tower, Kuala Lumpur


Hudson Yard, NYC

WHY CHOOSE STAINLESS STEEL?

Water storage tanks come in a range of materials including concrete, metal, and plastic - each with advantages and drawbacks. Overall, industry experts consider stainless steel tanks to be the optimal choice due to their ease of durability, corrosion resistance and environmental friendliness.

Traditionally made carbon steels corrode when exposed to environmental factors – high or low pH, moisture, and the presence of chemicals like chlorides. If carbon steel used to construct buildings corrodes, structural failures and safety hazards can result. But stainless steel, alloyed with other metals like chromium, retains its integrity in temperature extremes and severe weather and resists corrosion from water and contaminants.

DURABILITY AND LONGEVITY

Concrete tanks are prone to cracks and leaks due to manufacturing flaws, swelling and shrinking from temperature changes, and moisture - making expensive and time-consuming repairs or even replacement necessary. Stainless steel's strength and flexibility make it the water storage solution for a lifetime. Stainless steel's strength and flexibility mean its structural integrity stays intact in the face of environmental changes.

Concrete tank photo (cracks/spalling)
Plastic tank (hairline crack)

Corrosion and Erosion Free

LOWER LIFECYCLE COST

While tanks made from other materials may cost less initially, the longer lifespan and reduced maintenance and repair costs of stainless steel tanks mean reduced total cost of ownership. And steel's strength means the gauge of tank walls can be thinner. Lighter, thinner panels mean lower costs to transport and construct.

Because stainless steel doesn't need internal or external protective coatings, there is no scratching during installation, and no problems from aging or degrading coatings or peeling external paint.

EASY TO CLEAN

The ultra-smooth surface of Sunnik stainless steel tanks means sludge and mold won't stick or accumulate. To clean, just pressure wash with water.

MOST HYGIENIC

Stainless steel is the most sanitary material available for water containment, food processing and medical uses, making stainless steel tanks the most hygienic option for storing communities' drinking water.

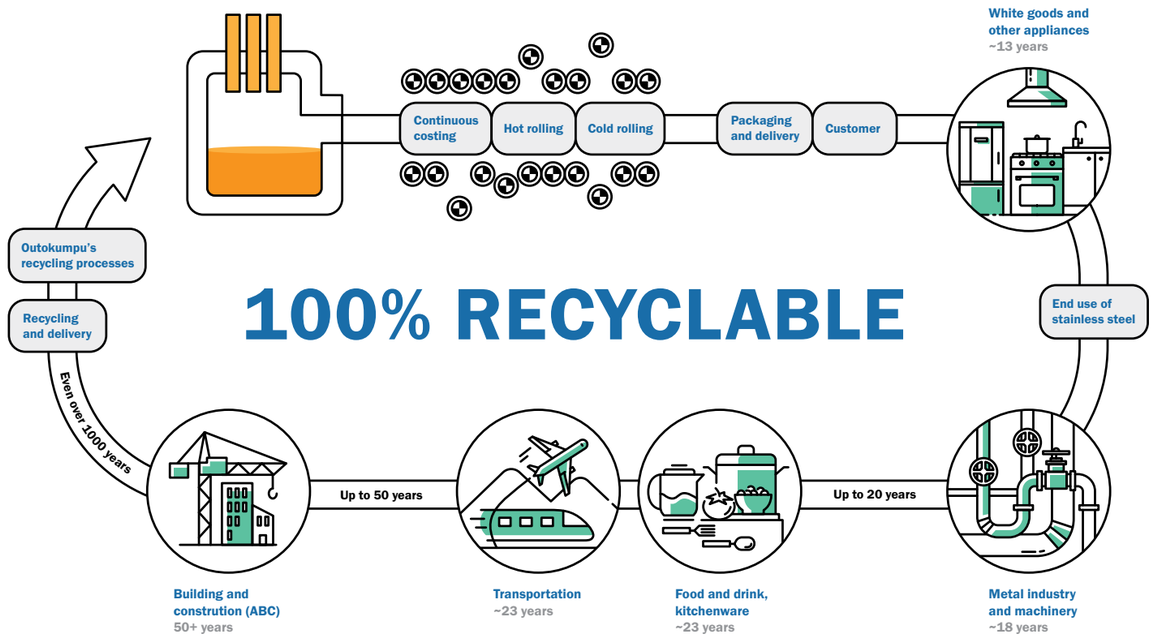
While plastic storage tanks initially cost less than stainless steel, they are susceptible to algae, bacteria and mold growth – as are costly concrete storage tanks that also leach calcium and can contaminate water supplies.

100% RECYCLABLE AND SUSTAINABLE

The environmental impact of extracting and producing materials that go into making storage tanks is a critical factor in choosing which storage tank to invest in.

Steel is the world's most recycled material - new stainless steel is 60-70% recycled with no loss of quality, and it's energy efficient to produce, minimizing its carbon footprint.

Stainless steel is also a safe metal alloy - it doesn't degrade and leach toxins into the environment.



OUR AIM IS TO MAKE STEEL WITH **ZERO WASTE**

5% THE GLOBAL GROWTH RATE (CAGR)

~90% RECYCLED CONTENT

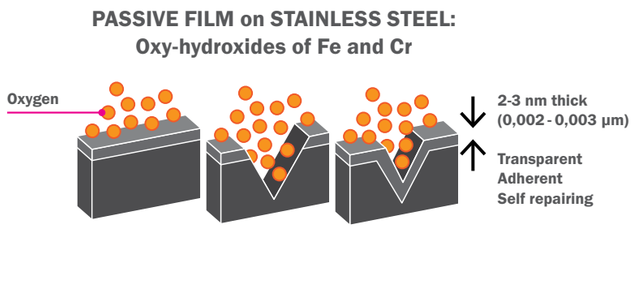
90% USE RATE OF SLAG

~70% OF ELECTRICITY COMES FROM LOW-CARBON SOURCES

https://www.outokumpu.com/en/sustainability/product-stewardship/stainless-steel-life-cycle

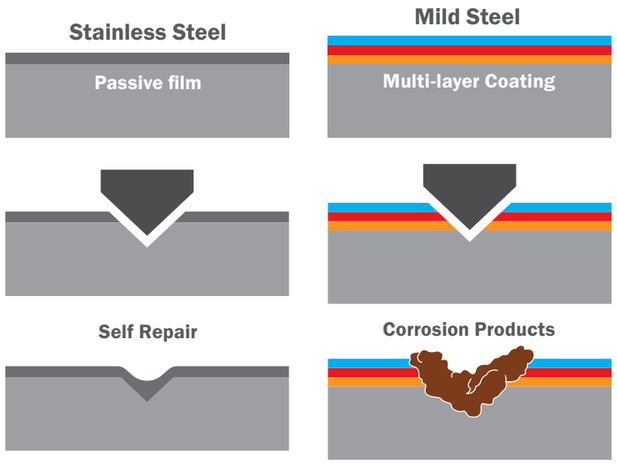
SELF REPAIR

PASSIVE LAYER vs. COATINGS



Stainless steel forms a “passive layer” that is highly stable and provides protection from corrosion and degradation and reduces reactivity in water.

DAMAGE TO PROTECTIVE LAYER



OPTIMIZED WATER STORAGE SOLUTION

CORROSION RESISTANCE
The chromium in stainless steel gives it the abillity to self-heal, bolstering resistance to staining and corrosion

100% ECO FRIENDLY & RECYCLABLE
Highly renewable and non-contaminating

HIGH & LOW TEMPERATURE RESISTANCE
Some grades will resist scaling and maintain high strength at very high temperatures, while others show exceptional toughness at cryogenic temperatures

ZERO MAINTENANCE
Low maintenance with just water jet to maintain stain-free surface

SUPERIOR HYGIENE
First choice in domestic drinking water tank, hospitals, kitchen, food, pharmaceutical and coastal storage tank.

STANDS UP TO HARSH CONDITIONS
Its corrosion-resistant passive layer, stainless steel withstands even the most challenging environments like coastal areas.

ASSURED QUALITY
Meets British (BS), Singapore (SS) and American (AISI) iron and steel standards

STRONG & LONG LIFE
Compared to other materials, significantly higher strength-to-weight ratio with solid and attractive appearance.

COMPARATIVE ADVANTAGES

	GRP PANEL TANKS	R.C. CONCRETE TANKS	HDG+HDPE PANEL TANKS	STAINLESS STEEL PANEL TANKS
Delivery	Fast delivery	Time consuming	Fast delivery	Fast delivery
Cost factor	Economical	Expensive	Economical	Average
Erection at site	Fast	Slow	Fast	Fast
Erection equipment	Minimum	Maximum	Minimum	Minimum
Capacity	Average	Good	Good	Good
UV resistance	Poor	Good	Good	Excellent
Maintenance	Economical	High	Economical	Nil
Handling durability	Fair	Good	Good	Excellent
Process	Hot pressed mould	Concrete & reinforce bars	Hydraulically pressed	Hydraulically pressed
Tank configuration	Good / Limited	Limited	Very Good	Very good
Recycle factor	Nil	Nil	Yes	Good
Tank relocation	Yes	Impossible	Yes	Yes
Height limitation	Max. 4 meter	Good	More than 4 meter high ^	More than 4 meter high ^
Loading factor	Good	Very high	Low	Low
Future capacity upgrade	Fair	Not possible	Very good	Very good
Repair factor	Repair externally, no disruption	Repair internally & disruption	Repair externally, no disruption	Repair externally, no disruption
Insulation	Good	Very good	Good	Good
Tensile strenght	Good	Very good	Very good	Good
Logistic	Very good / Palletized	Not possible	Very good / Palletized	Very good / Palletized
Water quality	Good	Fair / Need treatment	Very good with HDPE	Very good
Fire resistance	Poor	Good	Average	Good
Lifespan	Good	Very good	Very good with HDPE	Excellent
Base support tolerance	5.0mm (+-)	Nil	10-15mm (+-)	10-15mm (+-)
Steel base support	Compulsory	Nil	Not necessary	Not necessary
Corrossion	Nil	Fair	Very good with HDPE	Nil

^ Subject to manufacturer's approval

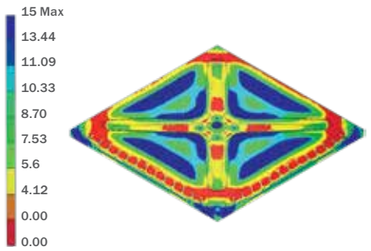
NOTE:

1) The above information is given to the best of our knowledge based on laboratory tests and practical experience. However, since we cannot anticipate or control the many conditions under which our products may be used, we can only guarantee the accuracy of our information or the suitability of our products in any given condition. We reserve the right to alter the given data without notice
2) *manufacturing specifications can be customized subject to arrangement with buyers

SUNNIK'S STAINLESS STEEL PANELS ARE ENGINEERED FOR SUPERIOR QUALITY AND PERFORMANCE

Just as all steels aren't created equal, neither are all stainless steels. Sunnik offers three stainless steel grades for clients to choose from based on conditions of use and budget: ss304, ss444 and ss316.

FINITE ELEMENT ANALYSIS



- Grade ss304 resists corrosion from a wide range of chemicals and is formulated for general liquid storage and fresh water environments. It's the least costly option but more prone to oxidation over its service life than ss316 and ss444.
- Grade ss444 has a lower price point but with the same corrosion resistance as ss316 due to low nickel content. However, ss444 is specially produced and a minimum order quantity is required.
- Grade ss316 maximizes corrosion resistance due to its high molybdenum content - suitable for harsh environments like seawater treatment plants with high chloride levels.

ALL SUNNIK'S STAINLESS STEEL IS

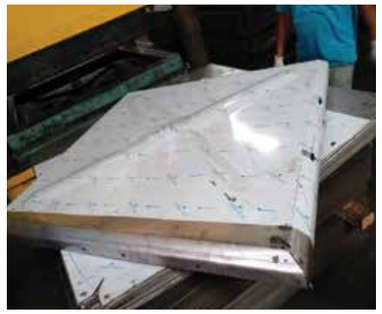
- NSF61/ANSI certified
- considered food-safe by the U.S. Food and Drug Administration
- compliant with American Iron and Steel Institute (AISI) standards
- Sunnik's stainless steel was also the first in Malaysia to receive SPAN (National Water Services Commission) approval for use in municipal water applications

OUR STAINLESS STEEL PANEL MANUFACTURING STEPS

Producing the highest quality stainless steel panels takes exacting manufacturing practices – including using only equipment designed for stainless steel and preventing contamination with corrosion-prone metals.

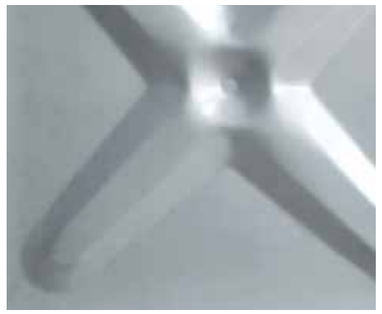
1 As the first step in the process, each raw stainless steel plate is quality controlled for proper thickness and covered with a film to protect against scratches and foreign particles.

2 Panels are cut using a fibre laser, which gives precise (with tolerance of 0.5mm), burr-free cuts needing no further refinement such as grinding, which can contaminate the steel's outer layer.



3 To meet our quality standards, each panel is molded on a high-power press (1000MT to 1500MT) using scrupulously clean molds. Our embossed design adds to the stainless steel's panel rigidity.

4 The panels are welded at each corner to form flanges. Welding is performed robotically for consistent quality (poor welding can result in leaking). A three-step dye penetrant inspection is then performed to detect any pinholes formed and rewelding is done if needed.



5 The final step is pickling and passivation following ASTM A380 Standard Practice for Cleaning, Descaling and Passivation of Stainless Steel Parts, Equipment and Systems. Pickling and passivation are chemical treatments that remove surface contaminants and promote formation of a protective film (continuous chromium-oxide passive film).

6 Hydrostatic Test

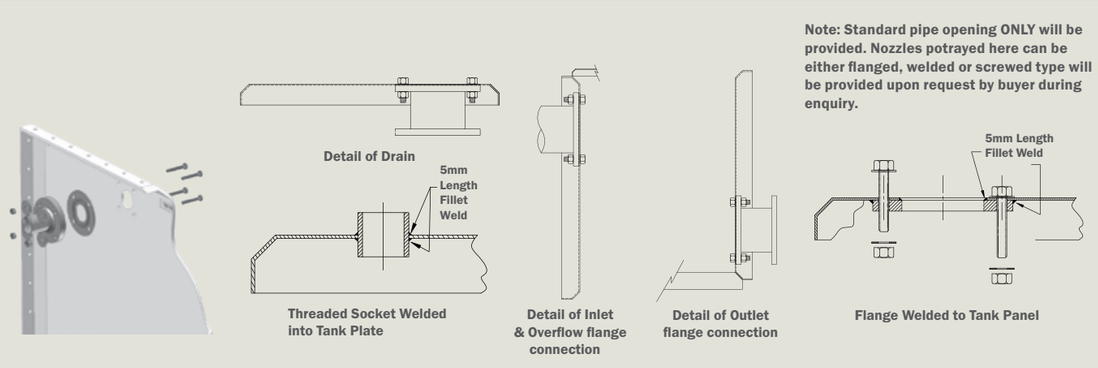
MODULAR STAINLESS STEEL WATER TANKS – FLEXIBLE AND EASY TO INSTALL

Sunnik stainless steel water tanks are modular - built from panels that are either 1m x 1m (3.28 ft. x 3.28 ft.) or 1.22m x 1.22 m (approx. 4 ft. x 4 ft.) panels, making them easy to install. (larger panels are more efficient for larger-size tanks) A tank's size, shape, and location are highly flexible, both at time of installation and later if needs have changed. They are watertight thanks to a state-of-the-art nontoxic sealant between the panels.

Tank panels are easily transported in CKD (complete-knocked-down) form in pallets of up to 25 per bundle (equating to one 24,000 liter tank). This portability enables a range of transportation options, minimizes transportation costs, and facilitates transportation to rural areas in CKD (complete-knocked-down). each pallet of up to 25 panels per bundle into containers

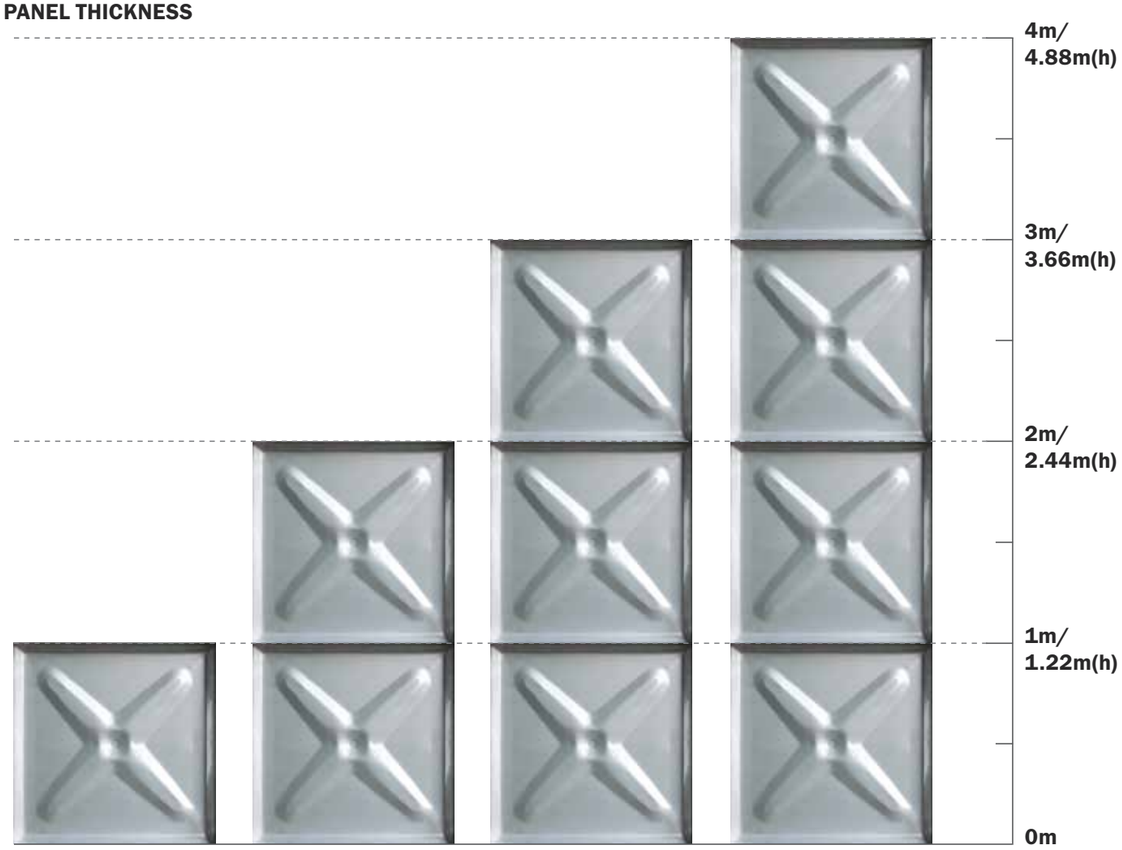
Each pallet weighs less than 1000 kg and can be unloaded separately. No special skills or tools are needed to assemble – the bolting system requires only an electrical or pneumatic impact wrench. With panel tanks only affected panels need to be replaced if there's a problem - not the whole tank. Problems with plastic, concrete, and non-modular steel tanks can mean the entire tank has to be replaced.

TYPICAL PIPE CONNECTION



SUNNIK PANEL DESIGN

PANEL THICKNESS



TYPE OF PANEL SIZES AVAILABLE

- **1 x 1 or 1 x 0.5**
- **1 x 1.5m**
- **4ft x 4ft or 4ft x 2ft**

Flexible and easy-to-install

BS 1564:1957 SS22:1979	1M x 1M	1.22M x 1.22M
Tank Height: 1m/1.22m	Bottom, sides walls – 2.0mm	Bottom, sides walls – 2.0mm
Tank Height: 2m/2.44m	Bottom, 1st tier – 2.5mm; side walls – 2.0mm	Bottom, 1st tier – 2.5mm; side walls – 2.0mm
Tank Height: 3m/3.66m	Bottom, 1st tier – 3.0mm; 2nd tier – 2.5mm; 3rd tier – 2.0mm	Bottom, 1st tier – 3.0mm; 2nd tier – 2.5mm; 3rd tier – 2.0mm
Tank Height: 4m/4.88m	Bottom, 1st tier – 4.0mm; 2nd tier – 3.0mm; 3rd tier – 2.5mm; 4th tier – 2.0mm	Bottom, 1st tier – 4.0mm; 2nd tier – 3.0mm; 3rd tier – 2.5mm; 4th tier – 2.0mm
Roof Cover(s)	Min 1.0mm or 1.5mm	Min 1.0mm or 1.5mm

NOTE:

i. Thickness of panels is to manufacturing specifications and can be adjusted per customer-manufacturer agreement to suit the tank's purpose and environment assuming applicable standards and safety factors are met.
ii. Manufacturing specifications and design are subject to change without prior notice
iii. Service water temperature and pH shall be at ambient temperature (38ÅãC) and neutral and constantly maintained at its intended water level.
iv. For tank finish selection and suitability, please seek manufacturer advice.

CAPACITY TABLE: 1.00 METER X 1.00 METER PANEL (METRIC SIZE PANEL)

Table of sizes, approximate weights and nominal capacity of tanks with external flanges-B.S. 1564:1975 (revised)

Height of Tank 1,000MM

Length x Breath		Nominal Capacity**		
mm	Plates*	M³	Gallons**	Approx. empty tank Wt. MT
2000 x 1000	8	2	440	0.41
3000 x 1000	11	3	660	0.56
4000 x 1000	14	4	880	0.76
2000 x 2000	12	4	880	0.66
3000 x 2000	16	6	1320	0.87
4000 x 2000	20	8	1760	1.06
5000 x 2000	24	10	2200	1.27
3000 x 3000	21	9	1980	1.12
4000 x 3000	26	12	2640	1.37
5000 x 3000	31	15	3300	1.63
6000 x 3000	36	18	3960	1.88
4000 x 4000	32	16	3520	1.67
5000 x 4000	38	20	4400	1.98
6000 x 4000	44	24	5280	2.29
7000 x 4000	50	28	6160	2.64
8000 x 4000	56	32	7040	2.95
5000 x 5000	45	25	5500	2.34
6000 x 5000	52	30	6600	2.75
6000 x 6000	60	36	7920	3.15
7000 x 6000	68	42	9240	3.58
7000 x 7000	77	49	10780	4.08

Height of Tank 2,000MM

Length x Breath		Nominal Capacity**		
mm	Plates*	M³	Gallons**	Approx. empty tank Wt. MT
2000 x 1000	14	4	880	0.76
3000 x 1000	19	6	1320	1.07
4000 x 1000	24	8	1760	1.32
2000 x 2000	20	8	1760	1.12
3000 x 2000	26	12	2640	1.43
4000 x 2000	32	16	3520	1.73
5000 x 2000	38	20	4400	2.19
3000 x 3000	33	18	3960	1.87
4000 x 3000	40	24	5280	2.25
5000 x 3000	47	30	6600	2.63
6000 x 3000	54	36	7920	3.11
4000 x 4000	48	32	7040	2.75
5000 x 4000	56	40	8800	3.17
6000 x 4000	64	48	10560	3.61
7000 x 4000	72	56	12320	4.08
8000 x 4000	80	64	14080	4.45
5000 x 5000	65	50	11000	3.58
6000 x 5000	74	60	13200	4.07
6000 x 6000	84	72	15840	4.65
7000 x 6000	94	84	18480	5.17
7000 x 7000	105	98	21560	5.74

Height of Tank 3,000MM

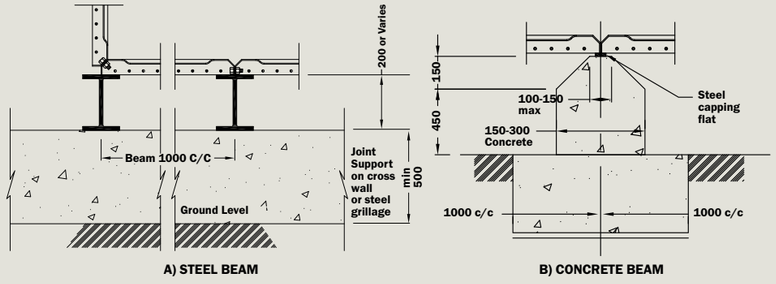
Length x Breath		Nominal Capacity**		
mm	Plates*	M³	Gallons**	Approx. empty tank Wt. MT
3000 x 3000	45	27	5940	2.98
4000 x 3000	54	36	7920	3.61
4000 x 4000	64	48	10560	4.27
5000 x 4000	74	60	13200	4.98
5000 x 5000	85	75	16500	5.74
6000 x 5000	96	90	19800	6.51
6000 x 6000	108	108	23760	7.32
7000 x 6000	120	126	27720	8.18
8000 x 6000	132	144	31680	8.99
7000 x 7000	133	147	32340	9.09
8000 x 7000	146	168	36960	9.97
9000 x 7000	159	189	41580	10.88
8000 x 8000	160	192	42240	10.98
9000 x 8000	174	216	47520	11.94
10000 x 8000	188	240	52800	12.96
9000 x 9000	189	243	53460	13.01
10000 x 10000	220	300	66000	15.19
11000 x 10000	236	330	72600	16.31
11000 x 11000	253	363	79860	17.53
12000 x 11000	270	396	87120	18.75
12000 x 12000	288	432	95040	19.98
13000 x 12000	306	468	102960	21.34
13000 x 13000	325	507	115400	22.76

Height of Tank 4,000MM

Length x Breath		Nominal Capacity**		
mm	Plates*	M³	Gallons**	Approx. empty tank Wt. MT
3000 x 3000	57	36	7920	4.01
4000 x 3000	68	48	10560	4.78
4000 x 4000	80	64	14080	5.69
5000 x 4000	92	80	17600	6.56
5000 x 5000	105	100	22000	7.47
6000 x 5000	118	120	26400	8.38
6000 x 6000	132	144	31680	9.39
7000 x 6000	146	168	36960	10.42
8000 x 6000	160	192	42240	11.43
7000 x 7000	161	196	43120	11.54
8000 x 7000	176	224	49280	12.6
9000 x 7000	191	252	55440	13.72
8000 x 8000	192	256	56320	13.81
9000 x 8000	208	288	63360	14.94
10000 x 8000	224	320	70400	16.16
9000 x 9000	225	324	71280	16.25
10000 x 10000	260	400	88000	18.8
11000 x 10000	278	440	96800	20.36
11000 x 11000	297	484	106480	21.73
12000 x 11000	316	528	116160	22.98
12000 x 12000	336	576	126720	24.67
13000 x 12000	356	624	137280	26.15
13000 x 13000	377	676	148720	27.65

Note: *Number of plates does not include partition plates and tank covers. Thickness subject to finishes & type of tank.
**a) Nominal capacity are without allowance for freeboad. (Basing on 6.25imp. gallon per cu.ft).
**b) To estimate net capacity a reduction from 12.5% on smaller tanks to 2.5% on larger tank should be allowed.

TYPICAL TANK SUPPORT @ 1.00M C/C



- All measurement in mm.
- Tank above 3000mmHt, steel capping flats shall be provided by purchaser on top of tank concrete support to ensure proper leveling and uniform distribution load.
- Support shall be effectively supported continuously under each bottom plate's flange in one direction @ 1000mm centres exceeding 150mm the length or breath of tank. Tolerance of ±6.0mm for level and diagonals between each row of support.
- Min. clearance of 500mm shall be provided all around the outside or underneath of tank for erection and maintenance purpose. Min 750mm clearance at roof top for ease access via 600mm manhole hatch.

CAPACITY TABLE: 1.22 METER X 1.22 METER PANEL (IMPERIAL SIZE PANEL)

Table of sizes, approximate weights and nominal capacity of tanks with external flanges-B.S. 1564:1975 (revised)

Height of Tank 1220mm (4 feet)

Length x Breath			Nominal Capacity**		
mm	Feet	Plates* 5mm	M³	Gallons**	Approx. empty tank Wt. MT
1220 x 1220	4 x 4	5	1.82	400	0.40
2440 x 1220	8 x 4	8	3.64	800	0.65
3660 x 1220	12 x 4	11	5.45	1200	0.85
2440 x 2440	8 x 8	12	7.27	1600	0.95
3660 x 2440	12 x 8	16	10.91	2400	1.25
4880 x 2440	16 x 8	20	14.55	3200	1.55
3660 x 3660	12 x 12	21	16.36	3600	1.65
6100 x 2440	20 x 8	24	18.18	4000	1.90
4880 x 3660	16 x 12	26	21.82	4800	2.05
6100 x 3660	20 x 12	31	27.27	6000	2.45
4880 x 4880	16 x 16	32	29.09	6400	2.55
7320 x 3660	24 x 12	36	32.73	7200	2.85
6100 x 4880	20 x 16	38	36.36	800	3.00
8540 x 3660	28 x 12	41	38.18	8400	3.30
7320 x 4880	24 x 16	44	43.64	9600	3.45
6100 x 6100	20 x 20	45	45.45	10000	3.55
8540 x 4880	28 x 16	50	50.91	11200	4.00
7320 x 6100	24 x 20	52	54.55	12000	4.10
9760 x 4880	32 x 16	56	58.18	12800	4.60
7320 x 7320	24 x 24	60	65.45	14400	4.65
8540 x 8540	28 x 28	77	89.09	19600	6.05

Height of Tank 2440mm (8 feet)

Length x Breath			Nominal Capacity**		
mm	Feet	Plates* 5mm	M³	Gallons**	Approx. empty tank Wt. MT
2440 x 1220	8 x 4	14	7.27	1600	1.15
3660 x 1220	12 x 4	19	10.91	2400	1.60
4880 x 1220	16 x 4	24	14.55	3200	2.05
2440 x 2440	8 x 8	20	14.55	3200	1.65
3660 x 2440	12 x 8	26	21.82	4800	2.15
4880 x 2440	16 x 8	32	29.09	6400	2.65
3660 x 3660	12 x 12	33	32.73	7200	2.70
6100 x 2440	20 x 8	38	36.36	8000	3.10
4880 x 3660	16 x 12	40	43.64	9600	3.25
6100 x 3660	20 x 12	47	54.55	12000	3.85
4880 x 4880	16 x 16	48	58.18	12800	3.95
7320 x 3660	24 x 12	54	65.45	14400	4.40
6100 x 4880	20 x 16	56	72.73	16000	4.60
8540 x 3660	28 x 12	61	76.36	16800	5.00
7320 x 4880	24 x 16	64	87.27	19200	5.30
6100 x 6100	20 x 20	65	90.91	20000	5.45
8540 x 4880	28 x 16	72	101.82	22400	6.00
7320 x 6100	24 x 20	74	109.09	24000	6.05
9760 x 4880	32 x 16	80	116.36	25600	6.70
7320 x 7320	24 x 24	84	130.91	28800	6.95
8540 x 8540	28 x 28	105	178.18	39200	8.60

Height of Tank 3660mm (12 feet)

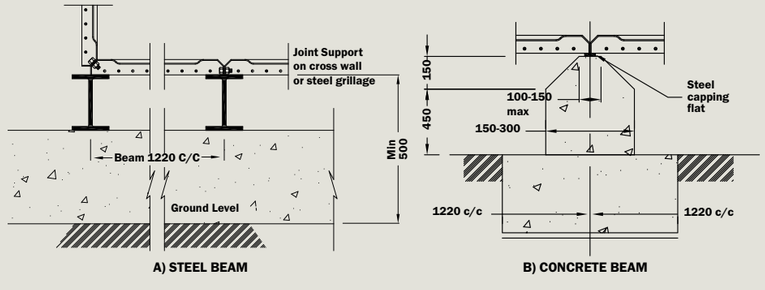
Length x Breath			Nominal Capacity**		
mm	Feet	Plates* 5mm	M³	Gallons**	Approx. empty tank Wt. MT
3660 x 3660	12 x 12	45	49.09	10800	4.50
4800 x 3660	16 x 12	54	65.45	14400	5.45
4800 x 4800	16 x 16	64	87.27	19200	6.45
6100 x 4880	20 x 16	74	109.09	24000	7.50
6100 x 6100	20 x 20	85	136.36	30000	8.55
7320 x 6100	24 x 20	96	163.64	36000	9.80
7320 x 7320	24 x 24	108	196.36	43200	10.95
8540 x 7320	28 x 24	120	229.09	50400	12.30
8540 x 8540	28 x 28	133	267.27	58800	13.65
9760 x 8540	32 x 28	146	305.45	67200	15.00
10980 x 8540	36 x 28	159	343.64	75600	16.35
9760 x 9760	32 x 32	160	349.09	76800	16.45
10980 x 9760	36 x 32	174	392.73	86400	17.95
12200 x 9760	40 x 32	188	436.36	96000	19.40
10980 x 10980	36 x 36	189	441.82	97200	19.50
12200 x 10980	40 x 36	204	490.91	108000	21.05
12200 x 12200	40 x 40	220	545.45	120000	22.80
13420 x 12200	44 x 40	236	600.00	132000	24.45
13420 x 13420	44 x 44	253	660.00	145200	26.35
14640 x 13420	48 x 44	270	718.18	158400	28.10
14640 x 14640	48 x 48	288	785.45	172800	30.05
15860 x 14640	52 x 48	306	850.91	187200	31.90
15860 x 15860	52 x 52	325	921.82	202800	33.95

Height of Tank 4880mm (16 feet)

Length x Breath		Plates*		Nominal Capacity**		
mm	Feet	5mm	6mm	M³	Gallons**	Approx. empty tank Wt. MT
3660 x 3660	12 x 12	36	21	65.45	14400	6.25
4800 x 3660	16 x 12	42	26	87.27	19200	7.60
4800 x 4800	16 x 16	48	32	116.36	25600	8.75
6100 x 4880	20 x 16	54	38	145.45	32000	10.05
6100 x 6100	20 x 20	60	45	181.82	40000	11.50
7320 x 6100	24 x 20	66	52	218.18	48000	13.00
7320 x 7320	24 x 24	72	60	261.82	57600	14.60
8540 x 7320	28 x 24	78	68	305.45	67200	16.10
8540 x 8540	28 x 28	84	77	356.36	78400	17.75
9760 x 8540	32 x 28	90	86	407.27	89600	19.50
10980 x 8540	36 x 28	96	95	458.18	100800	21.10
9760 x 9760	32 x 32	96	96	465.45	102400	21.30
10980 x 9760	36 x 32	102	106	523.64	115200	23.20
12200 x 9760	40 x 32	108	116	581.82	128000	24.90
10980 x 10980	36 x 36	108	117	589.09	129600	25.30
12200 x 10980	40 x 36	114	128	654.55	144000	26.95
12200 x 12200	40 x 40	120	140	727.27	160000	29.00
13420 x 12200	44 x 40	126	152	800.00	176000	31.00
13420 x 13420	44 x 44	132	165	880.00	193600	33.25
14640 x 13420	48 x 44	138	178	960.00	211200	35.35
14640 x 14640	48 x 48	144	192	1047.27	230400	37.60
15860 x 14640	52 x 48	150	206	1134.55	249600	39.90
15860 x 15860	52 x 52	156	221	1229.09	270400	42.30

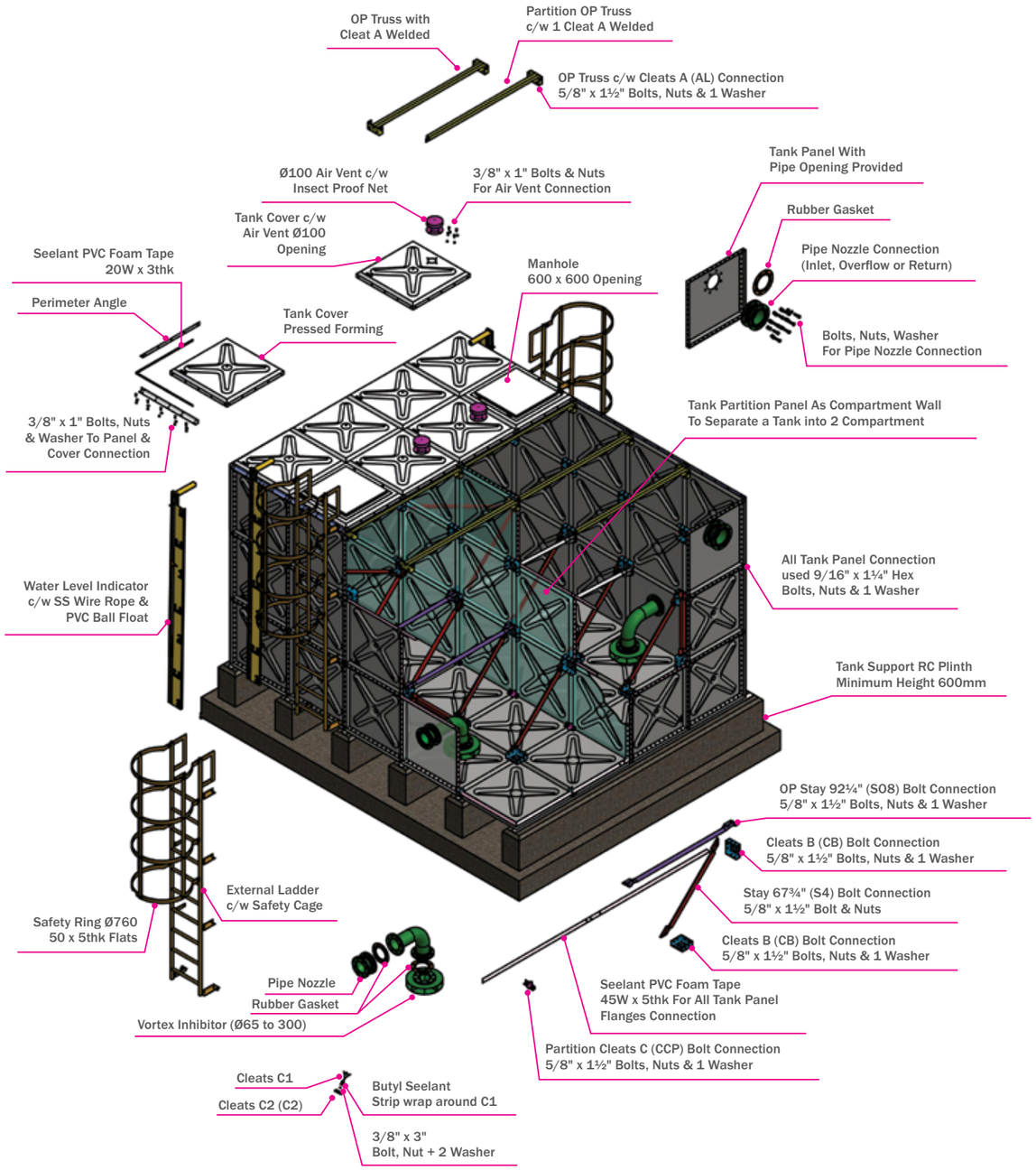
Note: *Number of plates does not include partition plates and tank covers.
**a) Nominal capacity are without allowance for freeboad. (Basing on 6.25imp. gallon per cu.ft).
**b) To estimate net capacity a reduction from 12.5% on smaller tanks to 2.5% on larger tank should be allowed.

TYPICAL TANK SUPPORT @ 1.22M C/C



- All measurement in mm.
- Tank above 3660mmHt, steel capping flats shall be provided by purchaser on top of tank concrete support to ensure proper leveling and uniform distribution load.
- Support shall be effectively supported continuously under each bottom plate's flange in one direction @ 1220mm centres exceeding 150mm the length or breath of tank. Tolerance of ±6.0mm for level and diagonals between each row of support.
- Min. clearance of 500mm shall be provied all around the outside or underneath of tank for erection and maintenance purpose. Min 750mm clearance at roof top for ease access via 600mm manhole hatch.

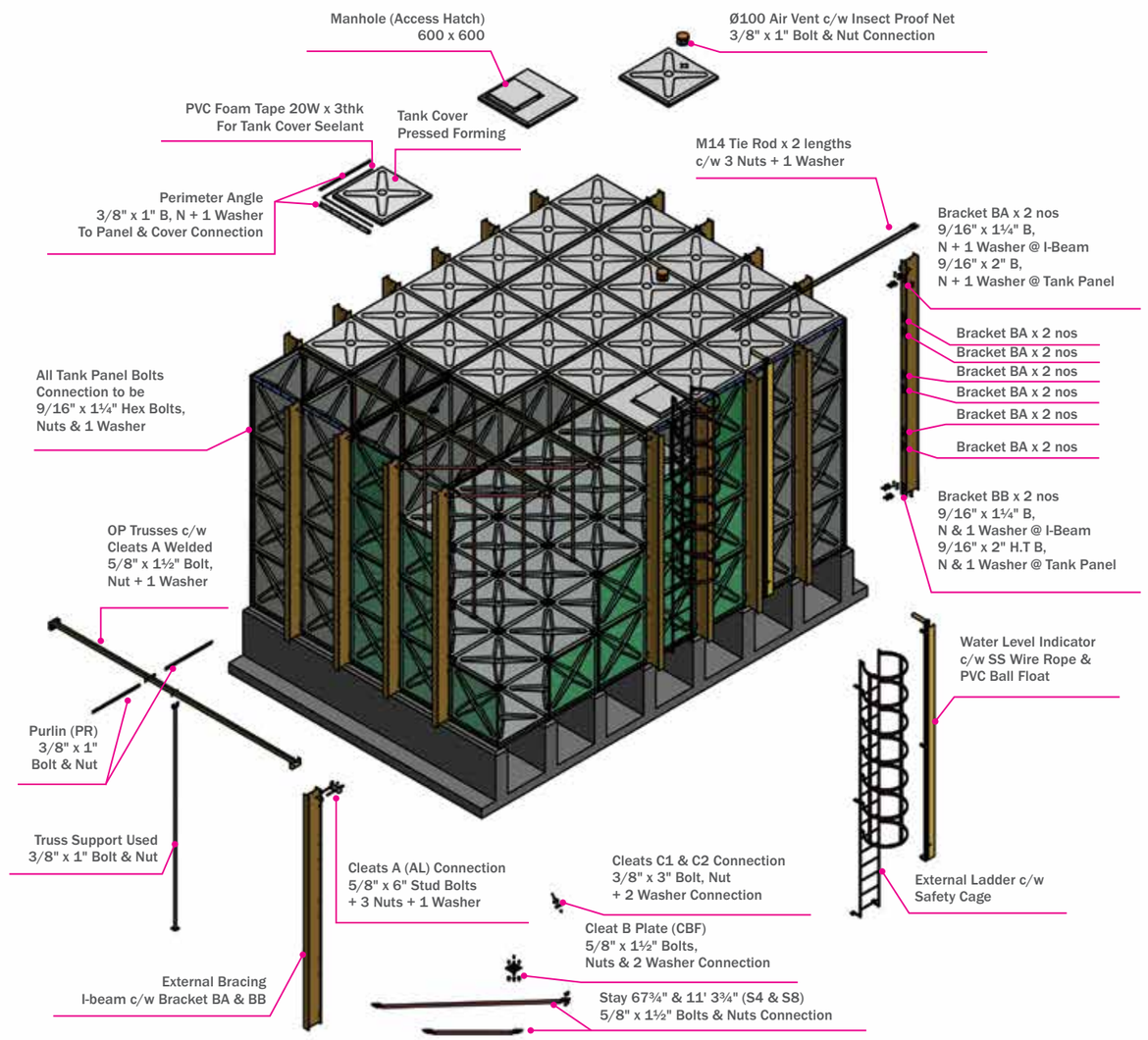
INTERNALLY REINFORCED BRACING SYSTEM



Isometric view - with two compartments

Note: bolts sizes and accessories design are subject to change without prior notice.

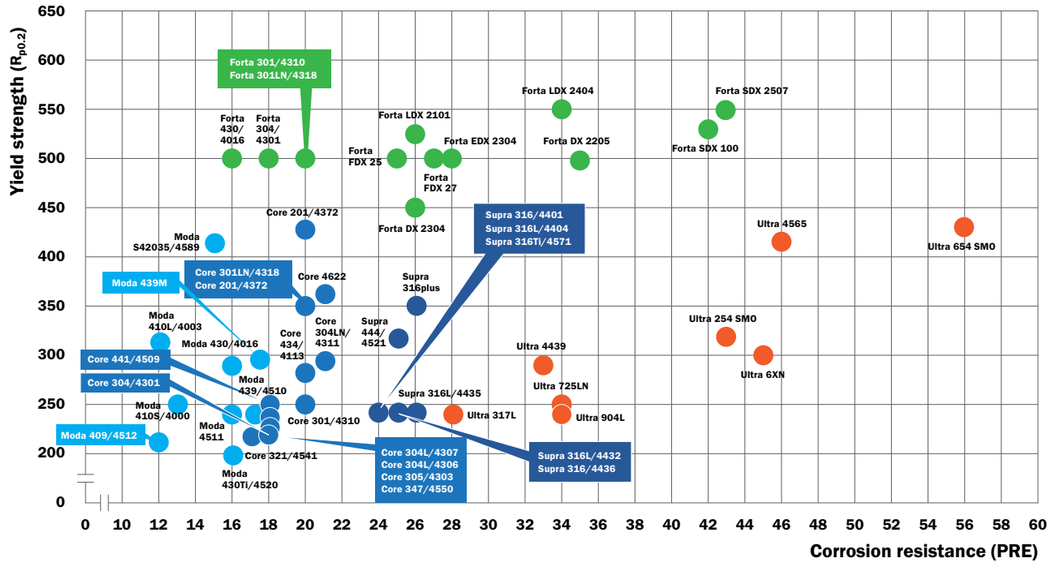
EXTERNALLY REINFORCED BRACING SYSTEM



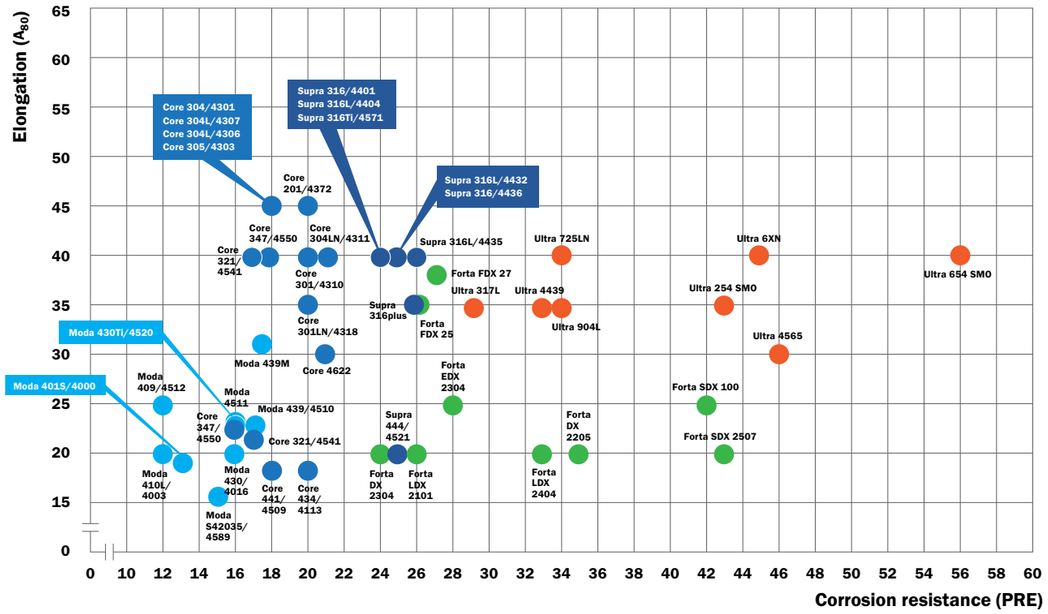
Isometric View

PERFORMANCE

Strength vs. corrosion resistance



Elongation vs. corrosion resistance



- Moda – Mildly corrosive environments (PRE up to 17)
- Core – Corrosive environments (PRE 17 to 22)
- Supra – Highly corrosive environments (PRE 22 to 27)
- Forta – Duplex and other high strength (PRE 18 to 43)
- Ultra – Extremely corrosive environments (PRE > 27)

Values for $R_{p\,0.2}$ yield strength and the A_{80} for elongation are according to EN 10088-2 min. values for cold rolled strip.

Chemical compositions and PRE calculations are based on Outokumpu typical values.

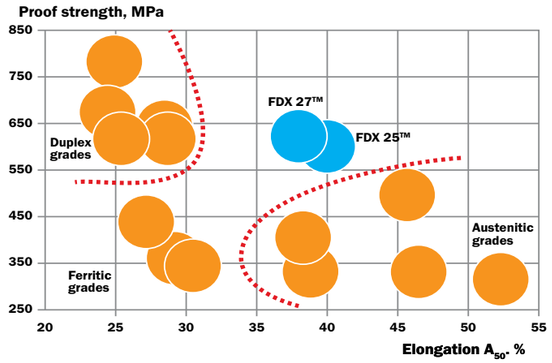
Please see values for other product forms at steelfinder.outokumpu.com

Note: No stainless steel survives more than 8% HCl concentration at room temperature.

PERFORMANCE OF STAINLESS STEEL

Grade	Yield strength Rp0.2 (MPa)	Tensile strength Rm (MPa)	Elongation A50%
China G201	210	390	30
China G409	279	412	34
304	220	520–700	52
444	300	420–640	
316L	240	530–680	46

Note: Otherwise stated, values according 10088-2:2014, Product forms: cold rolled coil and sheet
*Values according to EN 10028-7 September 2014



Chemical composition

Table 1

Outokumpu Steel name	CHEMICAL COMPOSITION, % BY WT. TYPICAL VALUES[1]							
	EN	ASTM/UNS	C	N	Cr	Ni	Mo	Others
FDX 25™	1.4635	S82012	≤ 0.05	0.16-0.26	19.0-20.5	0.8-1.5	0.1-0.6	2.0-4.0Mn
FDX 27™	1.4637	S82031	≤ 0.04	0.14-0.24	19.0-22.0	2.0-4.0	0.6-1.4	≤ 2.5Mn
LDX 2101®	1.4162	S32101	0.03	0.22	21.5	1.5	0.3	5Mn
2304	1.4362	S32304	0.02	0.10	23.0	4.8	0.3	Cu
4307	1.4307	304L	0.02		18.1	8.1		
4404	1.4404	316L	0.02		17.2	10.1	2.1	

[1] For FDX 25™ and FDX 27™ the range in chemical composition is given.
[2] Also available as EDX 2304™ with modified composition for enhanced properties.

Mechanical properties, room temperature

Table 2

Outokumpu Steel name	TYPICAL VALUES[1] (1mm)			MINIMUM VALUES[2]		
	$R_{p0.2}$	R_m	A_{50}	$R_{p0.2}$	R_m	A_{50}
	MPa	MPa	%	MPa	MPa	%
FDX 25™	600	800	40	500	700	35
FDX 27™	620	810	38	500	700	35
LDX 2101®	610	810	30	530	700	30
2304	620	790	27	400	600	25
4307	300	600	52	170	485	40
4404	290	590	46	170	485	40

[1] Typical values for FDX 25™ and FDX 27™ are in the process of being established.
[2] Minimum values according to ASTM A 240, for coil and strip ≤5mm.
Source: Outokumpu

WHICH GRADE IS SUITABLE?

Salt spray fog test puts materials in a very harsh environment of high-chloride test medium. Results below are based on chloride concentration of 3.0% (concentration in seawater is 1.8% and a max of 0.025% in drinking water.) Chromium and molybdenum (particularly for pitting and intergranular corrosion) are the most critical stainless steel alloying elements for corrosion resistance.

Type	Grade	Cr	Ni	Mo	Ti	Nb	Application	Corrosion resistance
Austenitic	SS304	18.1	8.1	0	0	0	i) general purpose grade ii) good resistance to atmospheric corrosion iii) food processing iv) food storing and transporting v) good formability	Good general resistance to atmospheric corrosion. Sufficient resistant in most environments, with the exception of marine and coastal areas. In heavy industrial or polluted areas, washing is important to prevent the formation of deposits, which may cause corrosion.
Ferritic	SS444	18.50	0	1.8	0.12	0.25	i) heat exchangers and hot water appliances ii) food industry iii) solar panels iv) automotive elements v) decoration and architecture	Shows better pitting corrosion resistance than conventional ferritic and austenitic stainless steel. Intergranular corrosion resistance is improved by double stabilization (titanium and niobium). It is not sensitive to stress corrosion cracking.
Austenitic	SS316	17.2	10.1	2.1	0	0	i) Chemical and petrochemical industries ii) food, pharmaceutical and textile industries iii) architectural decoration	Show higher resistance than Cr-Ni grades with corrosion rate <0.10mm/year when in contact with the following media i) 20% phosphoric acid at boiling temperature ii) 20% sulphuric acid at room temperature iii) 60% tartaric acid at 80°C iv) 50% acetic acid at boiling temperature v) 100% formic acid at 60°C vi) Beer vii) Milk viii) 100% oleic acid at 180°C ix) Petrol

Table: Elements in corrosion resistance EN10088. % of Wt

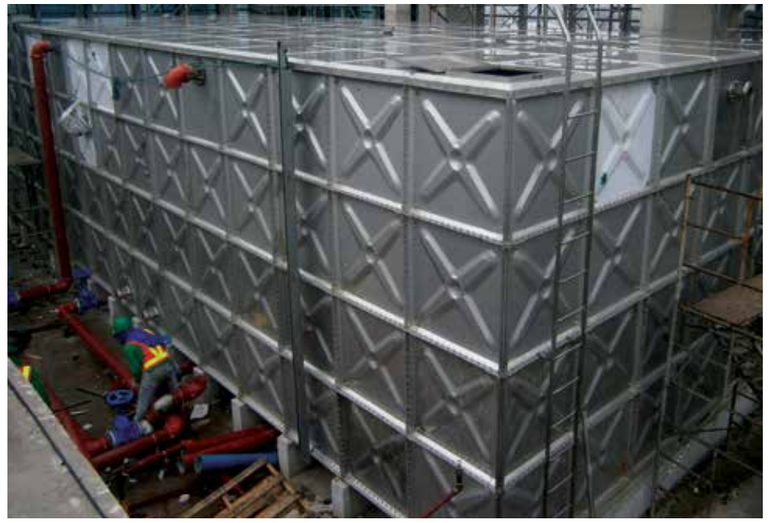
MANUFACTURING TECHNICAL SPECIFICATIONS

General Application	A potable water and food grade quality for water storage or corrosive liquid. Stainless steel tank is also suitable for corrosive or seaside environment
Approvals & Certifications	BS1564:1975 Suruhanjaya Perkhidmatan Air Negara (SPAN) NSF61 TUV SUD PSB Singapore to SS22 : 1979v
Type	'SUNNIK' stainless steel grade 304, 444 and 316 (L) low carbon
Dimension	Each panel steel of size 1.0m X 1.0mm or 1.22m X 1.22m square bolted in multiple to suit storage capacity or size
Material specifications	Stainless steel material according to EN 10088-1:2005 & ASTM A240. Steel plates shall be manufactured according to BS EN 10204. The tank panels, stays, cleats and pads shall be manufactured according to BS1564:1975 or SS22:1979. Material shall be of local or European mills
Panel	Hydraulically pressed with a combined double flanges welding at an angle of 45° & 90° or 90° to the face of the panel on all four sides complete with bolts holes
Reinforcement	Tank is supported either internally bracing (stays) and cleats (brackets) or externally by cold-formed hollow sections or I-Beam to ensure rigidity of tank up to maximum operating level. The internal accessories i.e stays and cleats shall of equivalent stainless steel grade of panel with double washer at bottom tier of tank for 4.88M height tank
Seismic (Earthquake)	Up to 1.5G with external reinforcement (upon request)
Bolts, Nuts & Washers	Hexagonal shaped and shall be of similar grade of panel
Sealant	Non-toxic and non-contaminating PVC Foam strips is supplied for jointing between flanges of panel and cleats for water tightness. Sealant shall be tested to BS6920:2000 and NSF61 approved
Roof Cover & Airvent	Hydraulically pressed panel cover of 1m X 1m or 1.22m X 1.22m of similar to size and type (material), fabricated with 610mm lockable manhole access and insect proof vent for each compartment of tank. Min. clearance of 750mm at roof top for ease of access via manhole hatch. 50Ø or 100Ø Air vent shall be rust and vermin proof.
Ladders	Standard internal of similar height and finishes of panel. External ladder(s) can be of similar finish with tank or hot dipped galvanized to ISO 1461. Safety cage for external ladder as optional for tank height above 3mH
Water Level Indicator	Stainless steel or Hot dip galvanized to ISO 1461:2009 indirect reading mechanical level indicator (ruler type) Other Option(s)- PVC transparent tube direct reading indicator calibrate in meter with float and valves can be supplied on request
Pipe connections & nozzles	Flange material connected to tank shall be equivalent to tank finish and all piping connected to tank must have its own support and vibration free to tank
Tank support (by others)	I-Beam or R.C. tank support shall be effectively supported continuously under each bottom panel flange in one direction @ 1000mm or 1220mm centres exceeding 150mm the length or breath of tank Min. 500mmH from ground level and min. clearance of 500mm shall be provided all around tank perimeter for erection and maintenance purpose Steel capping flat shall be provided on tank plinth for tank above 3mH
Packing	Each panel shall be protected with protective sheet to avoid contamination during handling. Wooden pallet packing and strapping are provided for protection
Cleaning and Sterilization	The welded area at panel 45° & 90° or 90° on all four sides shall be tested with Dye Penetrant test to avoid pinholes. All welded area shall be cleaned with pickling acid and passivated to protect against contamination and corrosion. Panel handling and sterilization of finish panel shall conform to American Iron & Steel Institute (AISI) procedures
Thickness of Tank Panels size(s) : 1M x 1M or 1.22M x 1.22M) Tank Height: 1m/1.22m : Bottom, sides walls – 2.0mm Tank Height: 2m/2.44m : Bottom, 1st tier – 2.5mm; side walls – 2.0mm Tank Height: 3m/3.66m : Bottom, 1st tier – 3.0mm; 2nd tier – 2.5mm; 3rd tier – 2.0mm Tank Height:4m/4.88m : Bottom, 1st tier – 4.0mm; 2nd tier – 3.0mm; 3rd tier – 2.5mm; 4th tier – 2.0mm Roof Cover(s) : Min 1.0mm	
Tank installation	Tank shall be installed in accordance to manufacturer's installation manual, specifications, standards & drawings provided or supervise by manufacturer authorized person
Leak test	Leak test with water filling at intermediate level of 1m or 1.22m left for 24hours and to be repeated until it reaches the intended water level
Panel	Hydraulically pressed with a combined double flanges welding at an angle of 45° & 90° or 90° to the face of the panel on all four sides complete with bolts holes
Reinforcement	Tank is supported either internally bracing (angle stays) and cleats (brackets) or externally by cold-formed hollow sections or I-Beam to ensure rigidity of tank up to maximum operating level. The internal accessories i.e stays and cleats shall be equivalent stainless steel grade of panel with double washer at bottom tier of tank for 4.88M height tank

i. Manufacturing specifications & design are subject to change without prior notice
ii. Manufacturing specifications can be customised subject to mutual agreement, manufacturer standards and safety factors
iii. Service water temperature and pH shall be at ambient temperature (38°C) and neutral and constantly maintained at its intended water level
iv. For tank finish selection and suitability, kindly seek manufacturer advice

THE HIGHEST QUALITY IS A TOP PRIORITY

We test all our products using the most rigorous methods under the harshest conditions and seek to meet the most demanding global standards - ensuring we deliver the highest possible quality.



OUR OFFICE:

SUNNIK ENGINEERING SDN BHD (113732-U)

Lot 3, Jalan CJ5
Cheras Jaya Industrial Estate
Balakong, 43200 Selangor D.E
Malaysia

Tel +603 9074 8888
Fax +603 9075 3333/2
Email enquiry@sunnik.com.my
Website www.sunnik.com.my

MEMBER OF:

American Water Works Association

IWA the international water association

FMM
Federation of Malaysian Manufacturers

CLAB
Construction Labour Exchange Centre Berhad

CIDB MALAYSIA
Construction Industry Development Board Malaysia

COMPANY CERTIFICATION:

ISO 9001 BUREAU VERITAS Certificati

AWARD:

The Malaysian Construction Industry **Excellence Awards 2013**
INTERNATIONAL ACHIEVEMENT
Special Mention

FMM
Federation of Malaysian Manufacturer Award 2014
TOP 3 FINALIST

PRODUCT CERTIFICATION:

Standards Organisation of Nigeria

State of Qatar Ministry of Interior

TÜV SÜD

NSF
National Science Foundation

SPAN
SPAN National Water Services Commission Malaysia

Brunei

Water Authority Hong Kong

MS
SIRIM BS1564:1975

WRAS
Water Regulatory Advisory Scheme, UK (WRAS)

Intertek

Printed: March 2020