

UNDERGROUND STORAGE TANKS
PERMATANKS



The petrochemical
industry's best value in
underground storage tanks.
Permatank®

Forgeweld has been manufacturing the Permatank® since 1992.
Today we are one of the world's major Permatank®
producers and our market keeps growing.

forgeweld

LEADERS IN STEEL TANK MANUFACTURE, SINCE 1963.



This revolutionary tank design, known as the "jacketed tank", was developed in the mid-1980s by the Permatank Corporation of the USA. It pioneered a lasting solution to environmental concerns. Permatank® double-wall tanks are not subject to rupture, cracking or the types of failure typical of other secondary containment systems. Forgeweld is the official supplier of Permatank® to Chevron South Africa.



Secondary containment: complete peace of mind

The Permatank® is a tough-as-nails 6 mm carbon steel (355JR) primary tank enclosed within a secondary containment tank of rock-hard Fibreglass Reinforced Polyester Resin (FRP).

The steel inner tank ensures structural strength and product compatibility (any type of fuel can be stored) while the FRP outer tank provides corrosion resistance and dependable secondary containment. Shipped with a factory installed Precision Test System to ensure double-wall integrity, it is designed for peace of mind.

The hermetically sealed outer tank of FRP completely isolates the primary tank from the underground environment. This coating is checked for discontinuities by a 35 000 volt holiday test over the entire surface. Once the coat has cured, a vacuum of 75 kpa is drawn on the interstice to provide moisture-proof tightness and longevity.

Your reassurance of long-life performance

- The outer tank is totally seamless. It covers 100% of the exterior of the inner steel tank.
- 100% corrosion protection is assured, without the need for sacrificial anodes.
- Tank openings are flush with the top and are laminated up to the threads. This eliminates the need for dielectric fittings.
- To prevent adhesion between the FRP and steel, a lining of standoff mesh and polyester film forms an interstitial.
- The tough FRP tanks are 100 mm thick.
- Factory-installed insulation pads protect the tank against any damage during transport or on-site storage.
- Striker plates under each tank opening provide interior corrosion protection.
- Zinc anodes eliminate the possibility of corrosion cells forming.

Exceeding the World's Toughest Standards

Our Permatanks® conform to and exceed some of the toughest standards in the world:

- UL 1746 Part III (Jacketed Tank): Underwriters Laboratory Standard for External Protection System for Steel Underground Tanks: this code makes it mandatory to provide monitoring of the interstice for leaks.
- SANS 1535 - Glass Reinforced Polyester Coated Steel Tanks for the Underground Storage of Hydrocarbons and Oxygenated Solvents Intended for Burial Horizontally: Regular inspections and tests by the SABS ensure our compliance with this standard.
- SABS 1531 Grade 355JR: the steel used in the manufacture of our composite tanks conforms to this specification (equivalent to Grade 43A of the applicable British Code).

Warranty policy: All storage tanks manufactured by Forgeweld Engineering (Pty) Ltd carries a warranty against defective materials and workmanship for a period of 24 months from the date of installation.



- No cathodic protection is required.
- Removable fitting lugs require zero FRP touching up or repair in the field.
- Reusable. Can be relocated.
- Multiple compartment tanks can be manufactured to specifications.

The most effective leak detection system

- Permatank® comes installed with its own integral precision test system that exceeds NFPA 30 standards, making it today's most sensitive leak detection technology available.
- It provides two-in-one monitoring: vacuum and liquid leak detection. It is triggered by the presence of both water and petroleum fuels.

- Thanks to continual self-monitoring, no field testing of the tank is needed prior to installation, which is a cost-efficiency.
- The Permatank® vacuum monitoring system consists of a vacuum gauge and conduit, both made of stainless steel.
- The system is shipped on the tank, ready for field installation.
- It is fully adjustable and can be adapted for remote service, up to 400 metres.
- The system is sealed for tamper-proof reading of the gauge. The capability for optional secondary monitoring is built in.

Sizes

The tanks are supplied in standard sizes ranging from 5 m³ to 45 m³ but larger units can be manufactured on request.

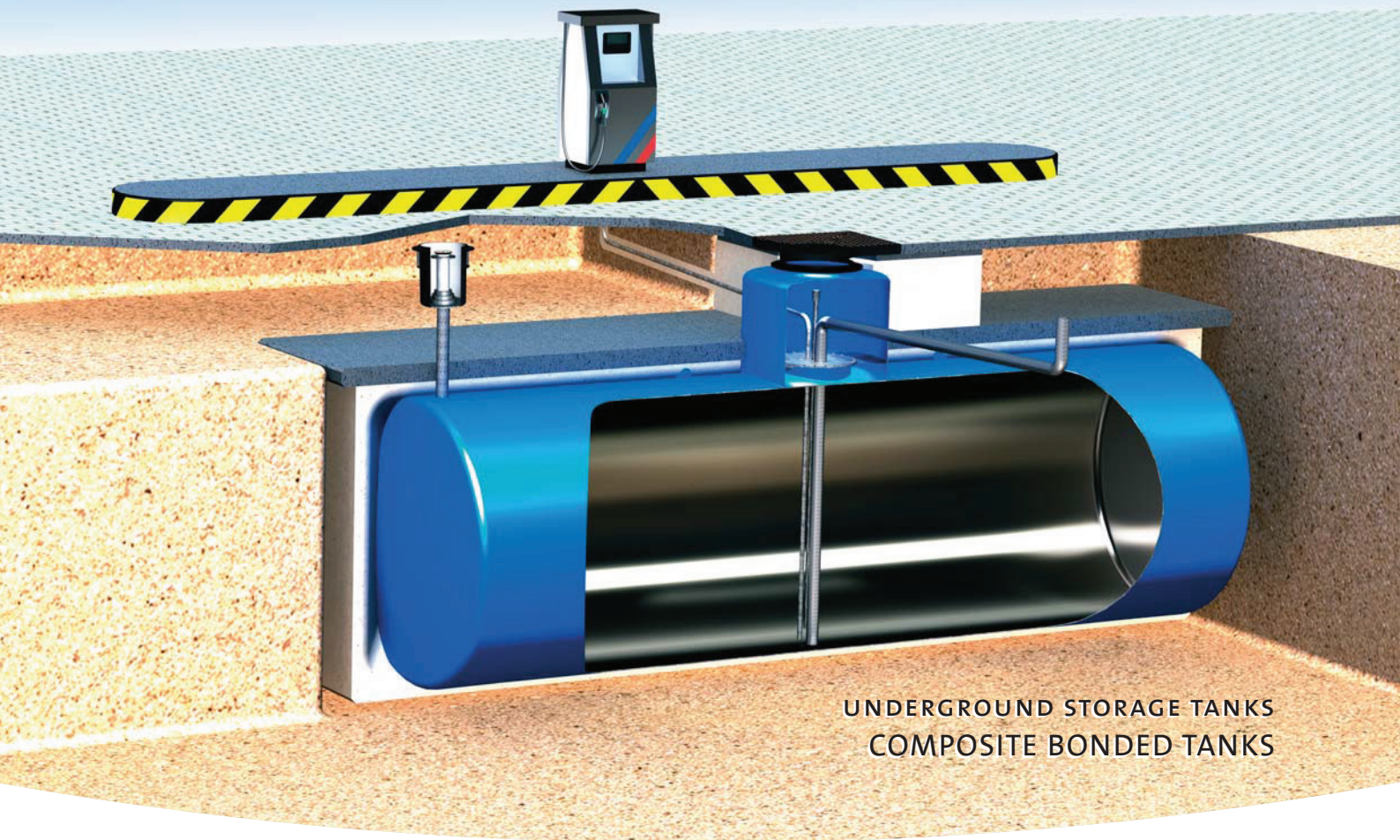
Tank dimensions and capacity

VOLUME m ³	IN. DIAMETER mm	OUT. DIAMETER mm	OVERALL LENGTH mm	SHELL THICKNESS mm	CALC. CAPACITY litres	APPROX. WEIGHT kg
4,5	1 810	1 817	1 900	6	4 835	1 107
9	1 810	1 817	3 600	6	9 161	1 600
14	1 810	1 817	5 500	6	13 996	2 146
23	2 318	2 330	5 500	6	22 851	2 921
30 Long	2 318	2 330	7 200	6	30 384	3 505
30 Dumpie	2 870	2 882	4 500	6	29 112	3 235
46 Long	2 318	2 330	10 800	6	45 576	4 807
46 Dumpie	2 870	2 882	7 200	6	46 579	4 360
60	2 870	2 882	9 800	6	60 164	5 285
83	2 870	2 882	13 160	6	83 150	7 009

For more details or to order, please contact your nearest Forgeweld office.

LEADERS IN STEEL TANK MANUFACTURE, SINCE 1963. FORGEWELD'S MISSION IS TO BE A LEADER IN FUEL STORAGE SYSTEMS BY PROVIDING ENVIRONMENTALLY FRIENDLY, INNOVATIVE, COST-EFFECTIVE, INTERNATIONALLY ACCREDITED PRODUCTS AND SERVICES.

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UNDERGROUND STORAGE TANKS
COMPOSITE BONDED TANKS

The strength of steel
meets the corrosion resistance of
polyester in one supertough
storage tank.

Problem-free performance without any external corrosion
monitoring - that's the beauty of Forgeweld's composite
bonded underground storage tanks.

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LEADERS IN STEEL TANK MANUFACTURE, SINCE 1963.



Combining the structural integrity of 6 mm SABS Grade 355JR carbon steel plate with the corrosion resistance of a 2,5 to 3 mm Fibreglass Reinforced Polyester (FRP) shell (Spec UL1746), these tanks have high tensile strength and impact properties and are recommended for the safe storage of all blends of conventional and oxygenated fuels, including methanol.



Built to high spec

The steel tanks are built with shell-and head-thickness to SANS 1535/UL 58 specifications.

Before application of the GRP laminate coating, the external surface of a tank shall be blast-cleaned to preparation grade SA 2,5, as described in ISO 8501-1 (as per SANS1535 standard). A 2.5mm coating of isophthalic resin, reinforced with chopped fibreglass, is applied to the entire external surface of the tank. (UL 58)

The finished cladding is quality checked by a 35 000 volt holiday test over 100% of its surface to ensure that there are no discontinuities in the coating.

Forgeweld composite tanks are fully insulated from the surrounding soil and are equipped with isolating bushes. Neither cathodic protection nor corrosion monitoring is required.

Tank dimensions and capacity

VOLUME m ³	IN. DIAMETER mm	OUT. DIAMETER mm	OVERALL LENGTH mm	SHELL THICKNESS mm	CALC. CAPACITY litres	APPROX. WEIGHT kg
4,5	1 810	1 817	1 900	6	4 862	860
9	1 815	1 817	3 700	6	9 468	1 342
14	1 815	1 817	5 500	6	14 074	1 826
23	2 318	2 330	5 500	6	23 210	2 231
30	2 318	2 330	7 300	6	30 806	2 850
46 Long	2 318	2 330	10 900	6	45 999	4 123
46 Dumpie	2 870	2 882	7 800	6	48 547	3 824
60	2 870	2 882	9 600	6	60 191	4 592
83	2 870	2 882	13 200	6	83 481	6 124
100	3 100	3 112	13 550	6	100 035	7 179



Adaptable to your needs

Depending on your requirements, Forgeweld composite tanks are fitted with lifting lugs and flanged or dished ends. Top-fitted 745 mm diameter manholes incorporate filler, dip, breather and suction (pump) apertures. A forecourt manhole can be supplied, should you require this. Drop pipes are also fitted to order.

Warranty policy

All storage tanks manufactured by Forgeweld Engineering (Pty) Ltd carries a warranty against defective materials and workmanship for a period of 24 months from the date of installation.

Top quality and safety standards

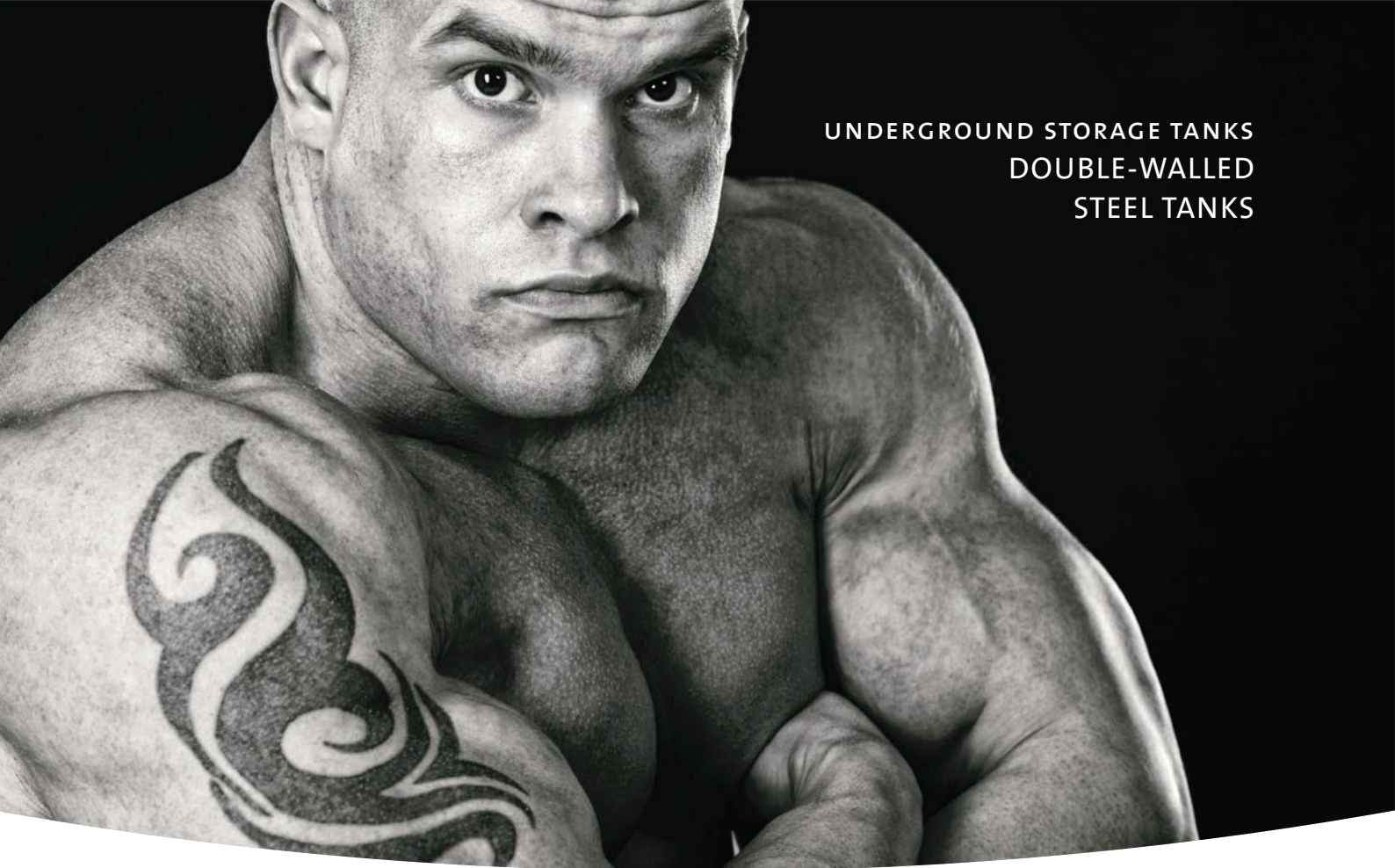
Forgeweld composite tanks are manufactured to the very highest standards, conforming to and even exceeding the requirements of the world's top standards authorities:

- UL 1746 Part II - Composite Tanks: This standard covers the material testing and application of the 2,5 mm FRP coating applied to the external surface of every Forgeweld composite tank. In terms of this standard, the application of a 2,5 mm FRP coating allows manufacturers to reduce shell tank thickness. We don't exercise this concession, thus ensuring that the structural strength and integrity of our composite tanks exceed that called for by this standard.
- SANS 1535 - Glass Reinforced Polyester Coated Steel Tanks for the Underground Storage of Hydrocarbons and Oxygenated Solvents Intended for Burial Horizontally: Regular inspections and tests by the SABS ensure our compliance with this standard.
- SABS 1531 Grade 355JR: the steel used in the manufacture of our composite tanks conforms to this specification (equivalent to Grade 43A of the applicable British Code).

For more details or to order, please contact your nearest Forgeweld office.

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UNDERGROUND STORAGE TANKS
DOUBLE-WALLED
STEEL TANKS

When you need a tank that's
built tough like a tank, call
in the heavyweights.

Built to last: double-walled steel for twice the peace of mind. Forgeweld Double-walled steel underground storage tanks (USTs) use secondary containment technology to banish any concerns over environmental contamination caused by leakage.

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LEADERS IN STEEL TANK MANUFACTURE, SINCE 1963.





The tanks consist of a steel primary tank enclosed within a steel secondary tank. A 25-mm interstice is formed between the inner and outer tank. After tank installation, the interstice is filled with a mixture of water and glycol. Any loss of liquid level or pressure activates an alarm. The glycol mixture also provides insulation and temperature control.

A 2,5 mm composite (Fibreglass-reinforced Polyester Resin or FRP) or 0,8 mm polyurethane coating can be applied to the outer steel wall to provide corrosion protection.

Convenient access and fuel dispatch

Fitted with a 745 mm underground manhole. Optional forecourt manhole. Manholes incorporate fittings and unions for filler, dip and breather, and suction (pump) apertures. 25 mm Sockets for monitoring the interstice topside at each end. Dished or flanged ends. Lifting lugs.

Tough enough to take on the world

The 6 mm carbon steel plate is South African made, complying with Grade 335JR. Both the inner and outer tanks are submerged arc welded for rugged strength.

As well as being certified by the United States UL 58 standard, our quality control measures are certified by independent auditors. Forgeweld's Double-walled storage tank carries a warranty against defective materials and workmanship for a period of 24 months from the date of installation.

Standard sizes are shown below. Tanks can be produced to order, but we recommend 40 m² as the maximum size due to mass considerations involved in transporting double-wall steel USTs; they are heavier than a Permatank® Jacketed or Composite UST of the same size.

Tank dimensions and capacity

VOLUME m ³	IN. DIAMETER mm	OUT. DIAMETER mm	OVERALL LENGTH mm	SHELL THICKNESS mm	CALC. CAPACITY litres	APPROX. WEIGHT kg
4,5	1 810	1 817	2 050	6	4 515	2 090
9	1 810	1 817	3 650	6	9 024	3 054
14	1 810	1 817	5 350	6	13 876	4 017
23	2 318	2 330	5 350	6	22 442	5 027
30	2 318	2 330	6 100	6	29 515	6 265

For more details or to order, please contact your nearest Forgeweld office.

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