

BALMORAL TANKS

HOT PRESS
GRP SECTIONAL
WATER TANKS



BALMORAL



Balmoral Tanks

Balmoral Tanks is a leading design and manufacturing company that provides unique turnkey services spanning civils groundwork, tank design and manufacture, installation, pipework, commissioning and technical after sales services.

Producing what is believed to be the most comprehensive range of tank products from a single source, civil engineering, firefighting, potable/non-potable water, anaerobic digestion, wastewater, desalination and drainage are key sectors for the company.

Trusted. Innovative. Collaborative.

Our decades-long global track record is built on outstanding levels of customer service. We continually drive efficiencies and add value to our valued client base through our end to end market offering from design to installation, commissioning and after sales care.

Since 2018 we have invested more than \$25m in our 150,000sqft (14,000sqm) state-of-the-art design and manufacturing facilities as well as in a continuous learning programme for all staff. We believe we have the most technically advanced production facilities in the industry supported by unrivalled levels of expertise across the whole operation.

Our longevity is proof of our success; we're here for the long term.

Our promise

Balmoral Tanks benefits from being part of Balmoral Group Holdings Ltd and the huge support infrastructure that offers. It is this depth of expertise that differentiates us from any other tank manufacturer in the world.

With 40+ years' experience in managing the design, manufacture and installation of liquid storage and treatment products we will do all that is humanly possible to ensure delivery of your project on budget, on time with care and professionalism from enquiry to installation.

\$25M
INVESTMENT IN
MANUFACTURING
FACILITIES

Balmoral Tanks
Thurnscoe, England

Balmoral Tanks
Llantrisant, Wales

HOT PRESS GRP SECTIONAL WATER TANKS

With an unrivalled reputation for quality and service Balmoral offers sectional tanks, which can be pre-insulated, ranging from 1m³-10,000m³ litres capacity and erected to a height of 4m in 1m and 0.5m increments.

These tanks are designed and manufactured to BSEN 13280 standards and carry WRAS approval for potable water storage. All panels are fully tested to resist pressures in excess of six times their working pressure.

Design

The design of each sectional tank panel is modelled using FEA software. This allows fine detail to be thoroughly investigated and improved before proceeding to mouldmaking and production.

Materials

All materials used in the production and assembly of Balmoral GRP tanks are rigorously tested for potable water compatibility. This includes long term material performance and mechanical properties, non-metallic components, adhesives,

etc. Combined, these analyses form the basis of the company's extensive QC procedures.

Manufacturing process

Balmoral sectional tank panels are hot press moulded in glass reinforced plastics (GRP) using isophthalic unsaturated polyester resins and electrical glassfibre reinforcement.

The panels are moulded at temperatures up to 150°C under strict quality 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 undertaken in a purpose built controlled area, where high technology automated drilling equipment is used to complete production to exacting tolerance levels.



Feature	Benefit	Mechanical property	Performance value
Design	Designed to BS EN 13280 (2001)	Method of manufacture	Hot Press Moulded
Manufacturing	Consistent product offering dimensional stability	Specific gravity	1.8
Automated finishing	Provides high levels of accuracy	Tensile strength	110 Mpa
High grade materials	Improved resistance to bacterial growth, increased water resistance, reduced risk of osmotic attack. Colour RAL 7004	Flexural strength	220 Mpa
UV stabilised materials	Suitable for global climatic conditions	Flexural modulus	Detail
100% opacity	Prevents algae growth	Impact strength	180 Kj/m ²
Heavy duty cover	Low maintenance, resists wind and snow loadings. BS 6399 Pt1 (1996)	Barcol hardness	90
Integrated insulation	Provides U value of 0.6W/m ² K. CFC and HCFC free. Suitable for water storage up to 38°C (Non-standard - price on application)	Shear strength	107.8 Mpa
Exclusive sealant	WRAS approved, provides optimum performance under varying climatic conditions	Glass content	> 30%
Bracing	Designed to BS 6700:1997 to limit structure deformation	Thermal expansion	2.0 x 10 ⁻⁵ /°C
QA	Certified to BS EN ISO 9001:2015	Thermal conductivity	0.15 Kcal/m hr°C
		Overall heat transmission	0.6 W/m² K
		Water absorption	< 0.1%
		Light transmission	Zero
		Insulation thickness	40mm EPS
		Insulation cover	ABS

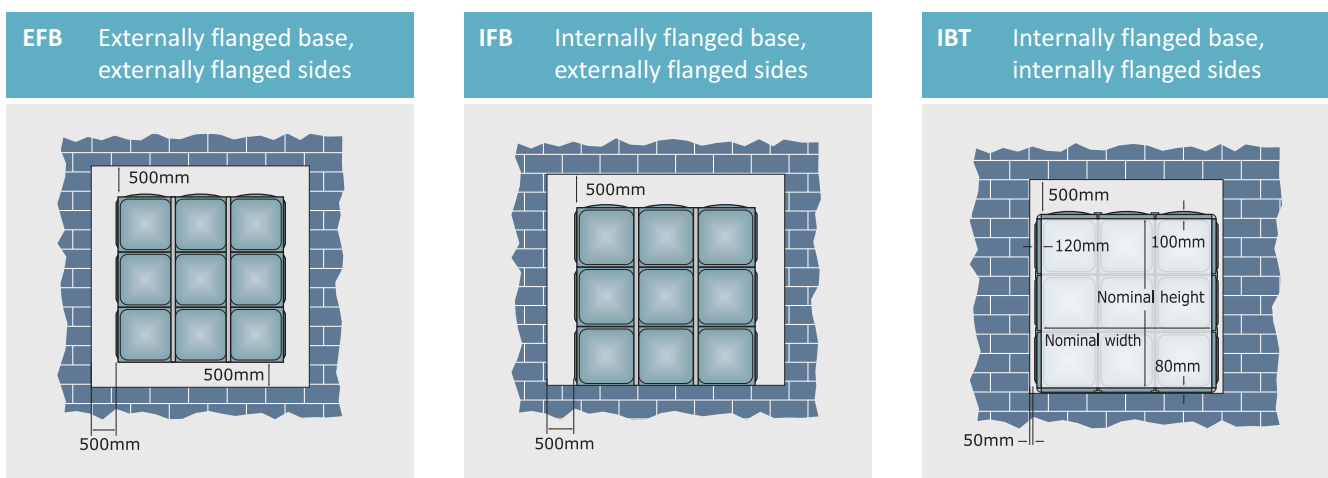
TANK CONSTRUCTION

The Balmoral range of sectional GRP tanks may be specified as either externally flanged base (EFB) or internally flanged base (IFB). This allows the use of either flat continuous foundations, close centre beams, pier walls or bearer beams depending upon the type of base required. The internally built tank (IBT) to be supported as standard on an IFB foundation.

The EFB specification is fully self draining allowing ease of maintenance and cleaning.

- Flexibility of panel sizes allows connections to be agreed on site to suit actual tank location
- Modular design provides ease of transport and flexibility of assembly on either a prepared flat and level concrete foundation, support walls or bearer beams
- Panels are rigidly supported by a combination of stainless steel tie rods internally and galvanised box sections externally
- Installation is carried out by Balmoral approved installers, fully trained to provide total unified responsibility

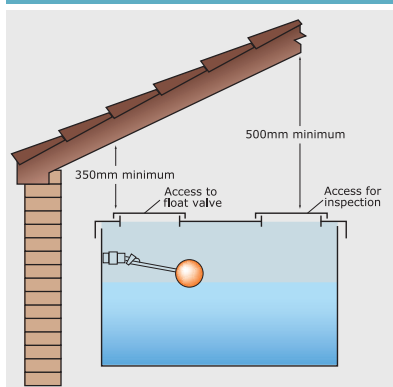
Flange types



- The dimensions shown above apply to tanks where the top of the tank is less than 2.5m above FFL. Where the top of tank is greater than 2.5m above FFL work at height equipment should be supplied.
- Dimensions increase to OD+750mm for fixed scaffold and OD+850mm for mobile tower
- *IBT tanks to be tight to two adjacent walls only*
- *500mm required underneath the EFB tank for installation*
- *IBT tanks maximum height: 3m*

Clearance requirements

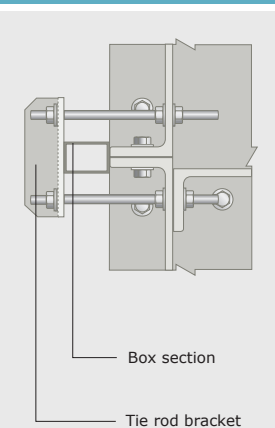
All installations require a clearance of 500mm above manway. A minimum clearance of 350mm is required above the tank to comply with water regulations.

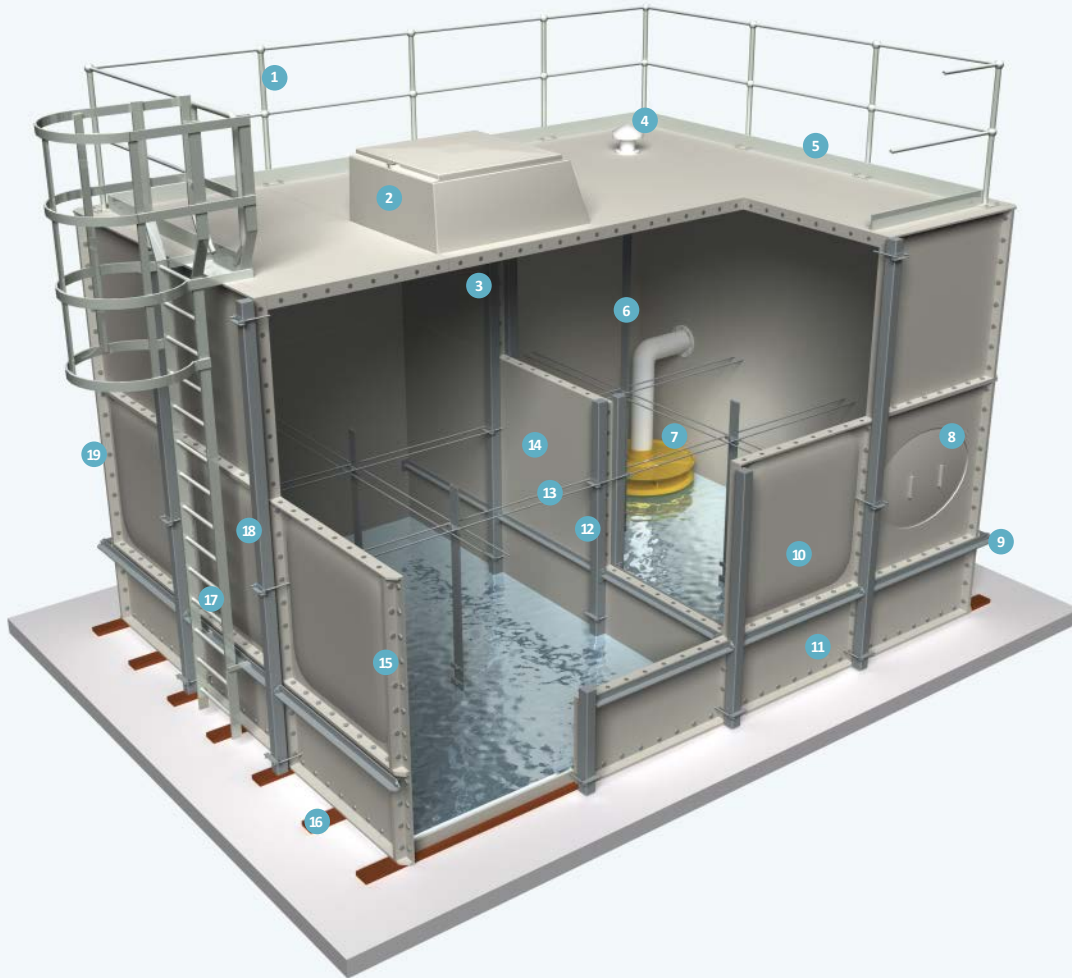


External plan sizes (for IFB/EFB only)

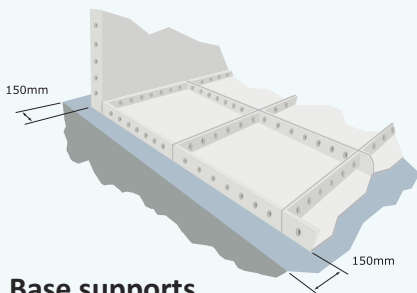
- Height up to 1m** add 80mm for flanges
= 80mm over the internal dimensions for each side
- Height up to 1.5m** add 80mm for flanges
add 80mm for galvanised box sections
add 50mm for tie rod brackets
= 210mm over the internal dimensions for each side
- Height from 2 to 4m** add 80mm for flanges
add 60mm for galvanised box sections
add 50mm for tie rod brackets
= 190mm over the internal dimensions for each side

Flange detail





- 1 Handrailing and supports
- 2 Float valve chamber (type AB and AF air gaps available)
- 3 A4 stainless steel internal fasteners and fixings
- 4 Screened air vent
- 5 Kick plate
- 6 Roof support struts
- 7 Balmoral FireFlow™ vortex inhibitor
- 8 Side entrance manway access panel
- 9 Galvanised steel external bracing
- 10 Hot press moulded GRP panels BS EN 13280 (2001)
- 11 0.5 x 1m hot press moulded panel
- 12 316 Grade stainless steel partition supports
- 13 316 Grade stainless steel internal tie rods
- 14 Partition panels
- 15 Hot press moulded GRP corner section
- 16 500mm centred 100x50mm high galvanised levelling steels
- 17 Aluminium or galvanised steel gated ladder (BS 4211)
- 18 Galvanised or stainless steel external fasteners and fixings
- 19 WRAS approved BALSEAL sealing strip

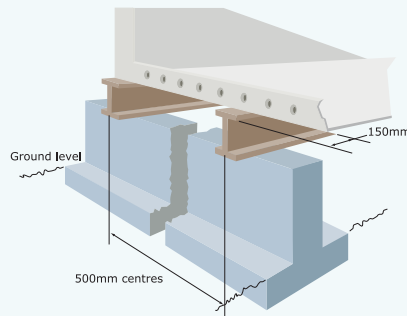


Base supports

Option 1 - Flat foundation

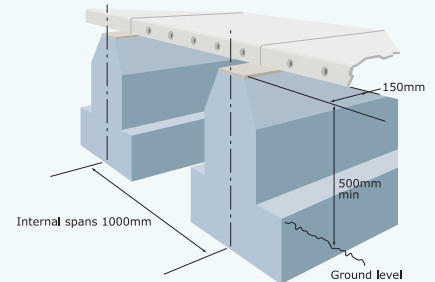
For IFB and IBT tanks. Flat screed concrete foundation to be level and not vary more than 2mm p/m or 6mm p/6m, measured laterally or diagonally.

Levelling steels are recommended due to difficulties in achieving +/- 2mm per metre over whole base area.



Option 2 - Close centre beams

IFB and IBT tanks may also be supported by steel bearer beams.

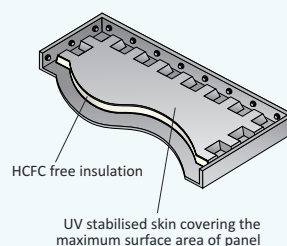


Option 3 - Pier walls

For EFB tanks allowing self drain. 1m centres required.

Thermal insulation

Balmoral Tanks uses expanded polystyrene (EPS) materials in its thermally insulated panels. This is made using a pentane expansion agent which is CFC and HCFC free and can be recycled by melting down and reforming.



Note: Tank configuration, panels and components are shown for illustration purposes only.

The image shows a large industrial structure, likely a water tower or storage tank, with a blue and white color scheme. The structure is composed of several vertical panels, some of which are blue and others are white. The blue panels have a grid-like structure, while the white panels are solid. The structure is mounted on a brick building. The text "TRUSTED INNOVATIVE COLLABORATIVE" is overlaid on the bottom left of the image.

**TRUSTED
INNOVATIVE
COLLABORATIVE**

FIRE FIGHTING SPRINKLER SYSTEMS

Automatic fire sprinkler systems are installed for two main reasons; property protection or life safety. In both cases their efficiency in controlling and extinguishing fires has for over one hundred and twenty years protected lives and the environment and it should be accepted that all sprinkler systems will protect lives by restricting fire spread and protection escape routes.

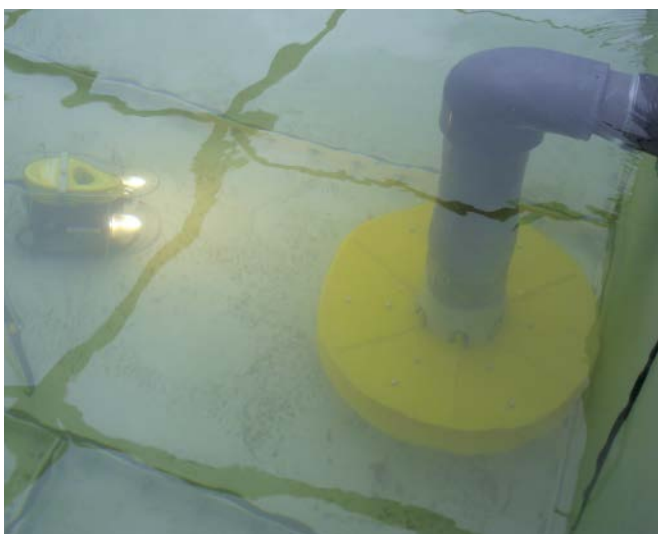
Property protection systems are often installed at the request of the building occupier's insurer to protect the business by ensuring the building and contents are protected against fire.

Some systems are installed to comply with building or fire regulations primarily to protect employees, the public and fire fighters from the risks of fire. This type of system should be more accurately referred to as 'enhanced availability' sprinkler systems but are more commonly called 'life safety' sprinkler systems and include a range of added features which reduce the possibility that the system will ever be non-operational due to scheduled service and maintenance being carried out.

In both of these cases an essential part of the system is the water supply. This can take the form of a direct supply from the local water service main with or without a booster pump or, more reliably, having water stored in a tank with a pump or pumps to deliver the water to the sprinkler system.

The most common arrangement is a single water storage tank with two fire pumps, each capable of meeting the needs of the sprinkler system.

For enhanced reliability, the water storage tank can be split into two half-capacity tanks. This ensures that there is always a water supply available to the sprinkler system, even when one tank (or any of its equipment) is being serviced or maintained.



Balmoral Tanks' vortex inhibitor undergoing test procedures

Balmoral FireFlow™ vortex inhibitor

Fire fighting water tanks require a large, fast flowing volume of water with a vortex inhibitor playing a key role in preventing air being drawn into the system and reducing the flow. Vortex inhibitors are fitted to the outlet pipe of the pumped water system.

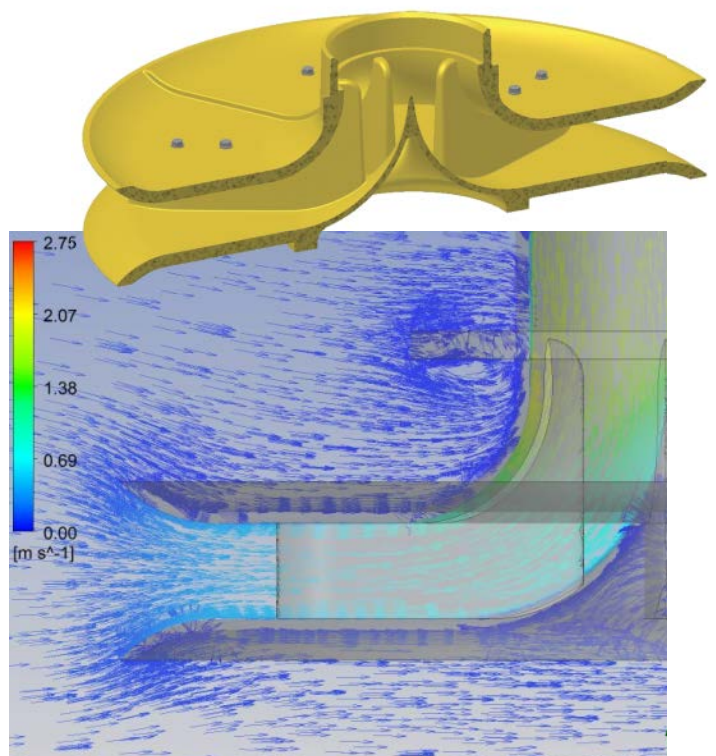
Standards require the usable water level to be no less than 100mm above the lowest suction point, the height of the vortex inhibitor also affects the effective capacity within a sprinkler tank.

Simple vortex inhibitors are available commercially; however the Balmoral FireFlow vortex inhibitor provides a significantly improved design which optimises both the capacity of the tank and the flow rate.

Balmoral's vortex inhibitor was designed using computation fluid dynamics to remove turbulent areas that would otherwise reduce the flow rate.

Balmoral's unique design fully meets the requirements of BS EN 12845 standards, including pipe dimensions, flow rate and mechanical strength, but with the advantage of increasing the effective capacity of the tank and decreasing the suction loss through the vortex inhibitor by an industry-leading 30%.

The injection moulded vortex inhibitors are made from structural thermosetting polyurethane, are fully corrosion resistant and range from 80-450mm in diameter. These PU materials are used by Balmoral's offshore division at water depths of 2000m and beyond.



This image is taken from a computational fluid dynamics analysis of the Balmoral FireFlow vortex inhibitor which clearly shows a smooth and uniform flow leading to drag reduction and a decrease in suction requirements

ACCESSORIES AND ANCILLARIES

Ball float valve

These are installed at the end of the incoming water supply pipe and automatically keep the tank full.

Pipe connections

Customers are asked to provide full details when ordering. The type of pipe connection should be specified together with the relevant standard to which the coupling flanges are drilled or the pipes screwed. To assist delivery, the size and position of each connection should also be specified at the time of ordering. Ball and gate valves and all pipework, including bends and flanges, can be supplied if specified at the time of ordering.

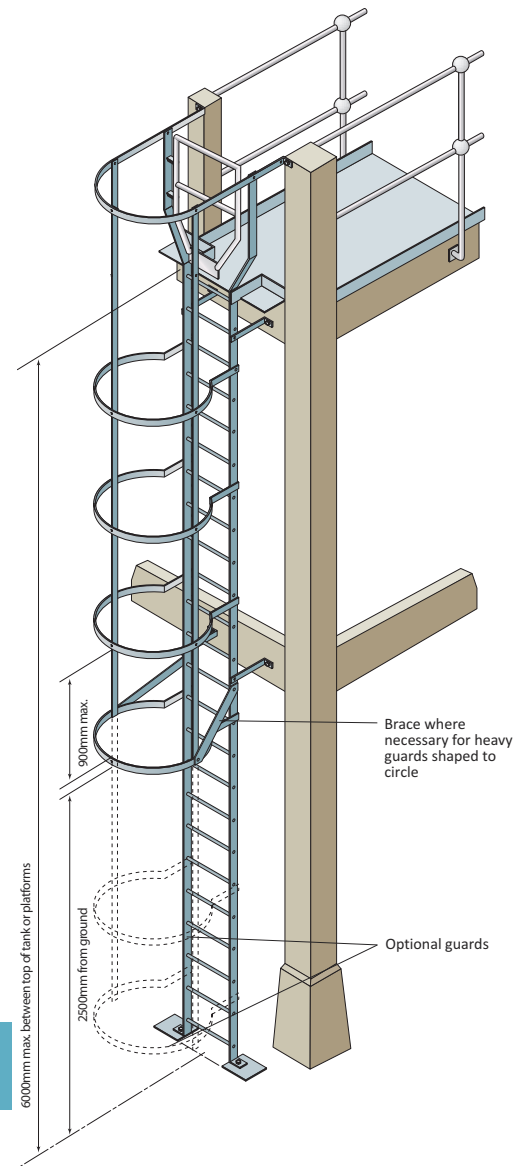
Connections can be supplied as flanged stools to BS4504, ASA or DIN standards, or, for small pipework, screwed sockets to BS1387. The connections are fitted to the plates in positions agreed at the time of order.

Pipework configuration

The inlet or delivery pipe can enter the tank through either the side wall at the top of the tank or into a raised chamber. Flow can be controlled through a ball valve, equilibrium float valve or automatic float switch.

Overflows should be positioned in accordance with the required air gap, and all outlets (suction), drains and overflows will come through the side walls of the tanks.

Overflows and warning pipes terminate at high level, horizontally, and can be extended to the floor if required.



Fixed ladder

Typical arrangement of a fixed ladder according to BS4211

TANK REPLACEMENT

Balmoral Tanks provides a complete tank replacement service and has completed a significant number of full service projects in recent years.

Acting as main contractors, Balmoral Tanks is supported by in-house health and safety, design and contract management while also providing guidance on ACOP L8 and CDM.

Turnkey project design and installation service

- Secondary base steel design and installation
- Tank design (ISO9001) and installation
- Tank removal and responsible disposal
- Establishment of temporary supply
- Pipework re-routing
- Updating/replacement of valve systems
- Health and Safety and CDM experience
- ACOP L8





**NOT JUST
ANOTHER
TANK COMPANY**

GRP ONE-PIECE TANKS

Balmoral one-piece tanks are manufactured to BS 13280:2001 standard using high quality glass reinforced polyester (GRP) resins. The tanks comply with UK Water Supply Regulations 1999 and have been tested and approved by WRAS.



Model	Internal Length	Internal Width	Internal Height	External Length	External Width	External Height	Capacity Litres	Capacity Gallons
BOP40-I	680	510	510	790	600	540	180	40
BOP50-I	737	559	559	812	634	580	230	50
BOP70-I	910	610	585	985	685	606	320	70
BOP70LP-I	1524	457	457	1599	532	503	320	70
BOP100-I	965	686	686	1040	761	732	454	100
BOP110-I	1300	750	510	1450	900	556	500	110
BOP110LP-I	1000	1000	500	1150	1150	546	500	110
BOP125-I	965	762	787	1065	862	833	570	125
BOP150-I	1092	864	737	1192	964	783	681	150
BOP200-I	1168	889	889	1268	989	935	910	200
BOP220-I	1000	1000	1000	1150	1150	1046	1000	220
BOP250-I	1524	914	813	1674	1064	859	1140	250
BOP300-I	1829	914	813	1979	1064	859	1370	300
BOP350-I	1524	1143	914	1674	1293	960	1590	350
BOP440-I	2000	1000	1000	2180	1180	1030	2000	440
BOP500-I	1524	1219	1219	1674	1369	1265	2280	500
BOP500LP-I	1829	1219	1022	1979	1369	1068	2280	500
BOP600-I	1829	1219	1219	1979	1369	1265	2730	600
BOP800-I	2438	1219	1219	2588	1369	1265	3640	800
BOP1000-I	2438	1524	1219	2588	1674	1265	4550	1000

All dimensions in mm



SPECIALIST PIPEWORK AND MECHANICAL SERVICES

Balmoral Tanks specialises in a full range of stainless steel pipework along with nominal bore carbon steel, fusion bonded epoxy coated carbon steel, ductile iron, galvanised and plastic pipework.

With decades of experience Balmoral provides the following services:

- Comprehensive range of pipework systems including stainless, carbon and coated steel, ductile iron, plastics
- Design, 3D modelling and site survey
- Off-site fabrication
- Pipe supports and bridges
- Bespoke fabrications
- Mechanical installation
- Skid units
- DfMA



LEGIONELLA COMPLIANCE AND WATER INDUSTRY SERVICES

W.E.T Services

Balmoral Tanks retains a majority shareholding in Water Environmental Treatment Ltd (W.E.T), servicing the UK legionella compliance and water industry services market.

W.E.T has been providing legionella sampling and risk assessments, water hygiene monitoring services, tank cleaning and remedial works since the first edition of ACoP L8 was published by the HSE in 1991 working with NHS trusts, county councils, schools, care homes, housing associations and property management companies.



Balmoral Group

Established in 1980, Balmoral is a diverse privately owned Group. Balmoral Tanks specialises in civil and environmental engineering liquid storage/treatment solutions while Balmoral Comtec provides buoyancy, protection and insulation product solutions to the offshore energy markets. Balmoral Park is the property development division of the Group.

At Group HQ in Aberdeen the company has invested in a pioneering design and manufacturing facility that includes laboratory, design engineering, toolmaking, production, project management and testing facilities.

Balmoral Tanks' Thurnscoe facility designs and produces the company's glass fused to steel, epoxy coated and stainless steel tanks as well as concrete tanks for the water, wastewater, processing and anaerobic digestion sectors.

In Llantrisant, South Wales, Balmoral Tanks runs a specialised design and manufacturing operation providing hot press GRP and steel sectional tanks as well as cylindrical steel tanks for the global water storage and fire-fighting sectors.

The Group is dedicated to a policy of continuous improvement and consistently providing the highest quality of products on a global basis.



Balmoral Group HQ, Aberdeen, Scotland

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GLOBAL WATER, WASTEWATER AND PROCESSING STORAGE SOLUTIONS



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