

Balmoral Subsea Test Centre

Hydrostatic, mechanical and laboratory testing



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Balmoral Subsea Test Centre

The Balmoral Subsea Test Centre offers a comprehensive range of test procedures including hydrostatic, mechanical and laboratory testing. Although predominantly used for in-house testing and development work these facilities and services are available to external customers.

Hydrostatic testing

Substantial investment has been made in improving and expanding the Balmoral Subsea Test Centre which now offers the largest commercially available hydrostatic vessel in Europe. Upgraded vessels, software and procedures are in place offering independent testing for all types of subsea equipment to 7000msw equivalent.

Standard tests available include:

- ▶ Uplift determination
- ▶ Water ingress
- ▶ Instrumented buoyancy loss
- ▶ Hydrostatic compression and creep
- ▶ Hydrostatic collapse
- ▶ Bulk modulus
- ▶ Buckle arrestment performance

The hydrostatic vessels use air driven liquid pumps and can accommodate electric, hydraulic and instrumentation connections. Each vessel can be fitted with chart recorders, pressure and temperature data loggers providing highly detailed results for analysis.

Industry-leading pressure vessel available

Commissioned in 2011, 'PV6' is Balmoral's latest addition to its suite of pressure vessels and forms the centrepiece of the purpose-built Subsea Test Centre.

Installed vertically with an internal diameter of 1830mm (72") an internal length of 9000mm (29.5') and a maximum operating pressure of 410 bar (6000psi), the vessel is fitted with penetration flanges to allow the connection of hydraulic and/or electrical lines. The quick closure flange fitted to the vessel lid aids prompt turnaround times.

In common with all the other vessels, PV6 is available for third party testing.



Balmoral hydrostatic testing facilities

Vessel	Safe working pressure		Internal length		Internal dia		Orientation
	psi	bar	ft/in	mm	in	mm	
PV1	5200	358	35' 6"	10825	52"	1320	Hor
PV2	10000	700	7' 9"	2380	19"	485	Vert
PV3	10000	700	7' 9"	2380	19"	485	Vert
PV4	10000	700	7' 9"	2380	19"	485	Vert
PV5	10000	700	1'	300	5.5"	140	Vert
PV6	6000	410	29' 6"	9000	72"	1830	Vert

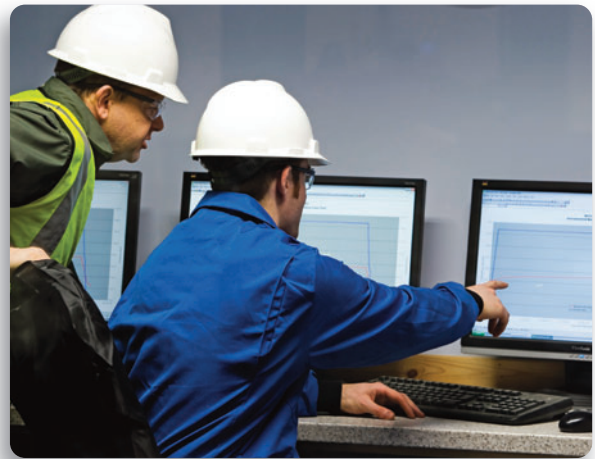
Displacement tanks are available for large scale uplift testing. Internal dimensions of the two tanks are:

- ▶ 6600 x 2300 x 2300mm deep
- ▶ 9800 x 2500 x 2750mm deep (unfilled weight 16 tonne)

Mechanical testing

A multi-purpose load rig, capable of performing axial slip loads, lateral and static loading, three-point bending and clamp overload tests has also been installed.

The test centre provides the industry with a fully comprehensive single source for buoyancy and PU product requirements from concept to testing.



Development laboratory

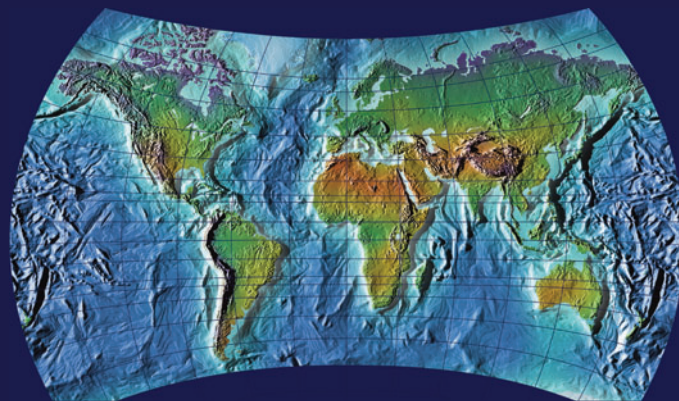
The laboratory at Balmoral Offshore Engineering is equipped with the very latest in development, testing analysis and inspection equipment. Run by a highly experienced and dedicated technical team the lab is at the centre of the company's R&D programme.

As well as providing a professional in-house service, Balmoral's lab is available for external development and testing programmes.

Balmoral Offshore Engineering

A client focused company Balmoral Offshore Engineering is dedicated to cost effective technology-led composite and polymer solutions for the subsea and deepwater oil and gas sector.

Balmoral's team of specialist engineers has provided subsea products to the international market since 1980.



Product portfolio

- Anchor pendant buoys (APB)
- Bend restrictors
- Bend stiffeners
- Buoyancy repairs
- Buoyancy fittings
- Centralisers
- Cylindrical modular buoyancy (CMB)
- Distributed buoyancy
- Diving bell insulation
- Doghouses
- Durafloat™ RIS drilling riser buoyancy
- Duraguard™ cable and flowline protection
- Duraguard™ HD
- Duramat™
- Elastotherm™ thermal insulation buoyancy
- Fenders
- Flexlink™ umbilical buoyancy
- Flowtherm™ hybrid riser tower buoyancy
- FlowthermPlus™
- Insulation covers
- Mini cylindrical modular buoyancy (MCMB)
- Modular buoyancy
- Mooring buoys
- Navigation aids
- Oceanus™ floats
- One-piece subsurface buoyancy
- Piggyback clamps
- Pin and box end protection
- Riser clamps
- Riser protection
- ROV/AUV buoyancy
- Saddles
- Spacers
- Strakes and fairings
- Supatherm™ thermal insulation buoyancy
- SupathermPlus™
- Tri-buoys
- Umbilical floats
- Wellhead insulation

Project portfolio

- | | | |
|--------------|----------------|------------------|
| Alba | Goliat | Pompano |
| Agbami | Gomez | Pyrenees |
| AKPO | Gumusut Kakap | Ruby |
| ASAP | Heidrun | Skarv |
| Aseng | Janice | Schiehallion |
| Åsgard | Jubilee | Snorre |
| Azurite | Kizomba | Stybarrow |
| BC10 | Kristin | Tahiti |
| Block 31 | Laggan Tormore | Thunder horse |
| Canapu | Liuhua | Troll |
| Deep Panuke | Livorno | Tupi |
| Djambala | MA:D6 | Typhoon |
| Foinaven | Olowi | Tyrihans |
| Galapagos | OYO | Usan |
| Gimboa | Pazflor | Visund |
| Galahad | Pierce | Wandoo |
| Girassol | Pluto | Whodat |
| Green Canyon | Poinsettia | Xijiang/Wenchang |

Representation

- Brazil
- Canada
- Italy
- Korea
- Malaysia
- Singapore
- United Kingdom (HQ)
- USA

Balmoral Offshore Engineering: Core values



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