DNV·GL

Certificate No:
TAD0000117
File No:
523.72
Job Id:
262.1-018000-2

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Well Testing Equipment

with type designation(s)
DRMA-AA, Assembly, Pressure Test, Mandrel, 10 ksi WP,
DRMA-BA, Assembly, Pressure Test, Mandrel, 15 ksi WP

Issued to
OneSubsea GmbH
Celle, Niedersachsen, Germany

is found to comply with
DNVGL-OS-E101 – Drilling facilities, Edition January 2018
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2017

Application :

See page 2

This Certificate is valid until **2023-12-10**.

Issued at **Houston** on **2018-12-11**
DNV GL local station: **Magdeburg** for **DNV GL**

Approval Engineer: **Pari Natarajan**

Christian Nilsen
Team Lead

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.
If any person suffers loss or damage which is proven to have been caused by any negligent act or omission of the Society, then the Society shall pay compensation to such person for his proven direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question. The maximum compensation shall never exceed USD 2 million.
In this provision the "Society" shall mean DNV GL AS as well as all its direct and indirect owners, affiliates, subsidiaries, directors, officers, employees, agents and any other person or entity acting on behalf of DNV GL AS.

© DNV GL 2014. DNV GL and the Horizon Graphic are trademarks of DNV GL AS.

Certificate No: **TAD0000117**
File No: **523.72**
Job Id: **262.1-018000-2**

Reference Standards

- NACE MR0175/ISO 15156, Petroleum and Natural Gas Industries - Materials for Use in H_2S Containing Environments in Oil and Gas Production, 2nd Edition 2009
- API 6A, Specification for Wellhead and Christmas Tree Equipment, 20th Edition, 2010
- API 5CT "Specification for Casing and Tubing, Eighth Edition
- ISO 13628-7 "Completion/work over riser systems" First Edition, November 2005

Product description

- 100646771 AH, Assembly, Pressure Test, Mandrel, 10 ksi WP
- 100684249 AF, Assembly, Pressure Test, Mandrel, 15 ksi WP

Application/Limitation

	DRMA-AA		DRMA-BA	
Design Parameter	Value	(Equivalent)	Value	(Equivalent)
Max Internal Working Pressure	10,000 psi	68.9 MPa	15,000 psi	103.4 MPa
Max Internal Test Pressure	15,500 psi	106.9 MPa	19,000 psi	131 MPa
Max Hanging Load at Working Pressure	400,000 lbf	1,779.3 kN	500,000 lbf	2,224.1 kN
Max Hanging Load at 0 psi	1,000,000 lbf	4,448.2 kN	1,200,000 lbf	5,337.9 kN
Min Design Temperature	32 °F	0 °C	32 °F	0 °C
Max Design Temperature	350 °F	177 °C	350 °F	177 °C
Corrosion Allowance	0.006 inch	0.15 mm	0.006 inch	0.15 mm
Service	Sour (H_2S)	NACE	Sour (H_2S)	NACE

Type Approval documentation

Note: Other part numbers or updated revisions may be acceptable under this Certificate, provided critical aspects of the design remain the same. Changes shall be documented and approved (via Engineering Change Notice or similar) by the Manufacturer's Engineering and/or Quality Department as appropriate. DNV GL's local surveyor shall verify the change before issuance of the Product Certificate.

Tests carried out

FAT report for DRMA-AA P/N 100646771 performed on 26th November 2018.

Marking of product

Product marking shall:

- Identify and differentiate each production unit
- Establish traceability to product design and fabrication documentation

Certificate Retention Survey

For retention of the Type Approval, DNV GL's surveyor shall perform a survey every second year in accordance with DNV GL Type Approval Scheme DNVGL-CP-0338, October 2015 Edition.

Other conditions/ comments

- Procedures related to testing, welding, NDE, and other quality control requirements are to be reviewed/approved by DNV GL's local surveyor.
- Fabrication records are to be maintained in accordance with DNVGL-OS-E101 Ch.3 Sec. 3 [2].
- When DNV GL Product Certification is required, each product is to be surveyed during fabrication in accordance with the requirements for Category I equipment as defined in DNV GL's Offshore Standard DNVGL-OS-E101.
- This certificate is a renewal of TAC D-5820

End of Certificate