DNV·GL

Certificate No:
TAD00000S4

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Marine Riser Equipment

with type designation(s)
Low Pressure FlexJoint

Issued to
Oil States Industries Inc.
ARLINGTON TX, United States

is found to comply with
DNVGL-OS-E101 – Drilling plant, Edition July 2015
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2015

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL when accompanied by a DNV GL Product Certificate (PC).

Issued at **Houston** on **2017-07-05**
This Certificate is valid until **2022-07-04**.
DNV GL local station: **Certification & Inspection Services**

Approval Engineer: **Mark Miser**

for **DNV GL**

Per Jørgen Tviberg
Team Leader

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.

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Job Id: **262.1-015352-2**
Certificate No: **TAD00000S4**

Product description

A Marine Drilling Riser FlexJoint is a steel and elastomer assembly having a central through-passage equal to or greater in diameter than the riser bore that may be positioned in the riser string to allow greater angular deflection which reduces local bending stress in the riser string.

Referenced Standards

[1] API 16F, "Specification for Marine Drilling Riser Equipment", 1st Edition

Application/Limitation

Design Parameter	Value	(Equivalent)
Rated Axial Tensile Load	: 4,448 kN	(1,000,000 lb_f)
Rated Axial Compressive Load	: 0 kN	(0 lb_f)
Rated Working Pressure	: 4.14 MPa	(600 psi)
Hydrostatic Test Pressure	: 6.21 MPa	(900 psi)
Minimum Design Temperature	: -20°C	(-4°F)
Maximum Design Temperature	: 230°C for 7 days : 25°C for 300 years	(446°F) (77°F)
Combined Loading Condition #1	: 2,224 kN, ±10° Conical Rotation, at 4.14 MPa : (0.5 x 10^6 lb_f, ±10° Conical Rotation, at 600 psi)	
Combined Loading Condition #2	: 4,448 kN, ±10° Conical Rotation, at 0 MPa : (1.0 x 10^6 lb_f, ±10° Conical Rotation, at 0 psi)	
Hydrotest Condition	: 0 kN, ±0° Conical Rotation, at 6.21 MPa : (0 lb_f, ±0° Conical Rotation, at 900 psi)	
Maximum Flex Angle	: ±10° Conical Rotation (i.e. angle is from generatrix to right cone axis)	
Service	: Well Control System, Marine Drilling Riser Equipment, Sour (H_2S)	

Design Limitation Note: Customer supplied Riser Couplings shall be provided with DNV GL Product Certification and may reduce the indicated design limitations.

Type Approval documentation

Tests carried out

1. Procedures related to testing, welding, NDT, etc. are to be reviewed/approved by DNV GL's local surveyor.
2. Factory Acceptance Test in accordance with OSI SO2F-00-001, Rev. D, 1998

Marking of product

Marking shall:

1. Be reviewed and approved by the DNV GL local surveyor.
2. Identify and differentiate each production unit <i.e. serial number>.
3. Establish traceability to product design and fabrication documentation.
4. Be in accordance with API 16F (Ref. 1st Edition §8.7).

Periodical assessment

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