

TYPE APPROVAL CERTIFICATE

This is to certify:

That the BOP Equipment

with type designation(s)
Drilling / Spacer Spools & Adapters

Issued to
B.O.P. Products
Houston TX, USA

is found to comply with
DNVGL-OS-E101 – Drilling plant, Edition January 2018
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2015

Application :

See page 2

Issued at **Houston** on **2018-01-26**

for **DNV GL**

This Certificate is valid until **2023-01-25**.
DNV GL local station: **Certification & Inspection Services**

Approval Engineer: **Monique Seymore**

Per Jørgen Tviberg
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.



Product description

Adapters - Pressure-containing piece of equipment having end connections of different nominal sizes and/or pressure ratings, used to connect other pieces of equipment of different nominal sizes and/or pressure ratings

- 7-1/16 10K X 4-1/16 10K Double Studded Adapter
- 18 3/4 15K X 18 3/4 10K Double Studded Adapter

Spools - Pressure-containing piece of equipment having end connections, used below or between drill-through equipment

- 18 3/4 10K Flanged X 18 3/4 10K Flanged Riser Spool (196.85" Height)
- 18 3/4 10K Flanged X 18 3/4 10K Flanged Riser Spool (91.00" Height)
- 18 3/4 10K Flanged X 18 3/4 10K Flanged Riser Spool (59.06" Height)

Design codes/standards used as references

- API 16A "Specification for Drill-through Equipment" 3rd Edition
- API 6A "Specification for Wellhead and Christmas Tree Equipment" 20th Edition

Application/Limitation

Nominal Bore Size	: 476 mm	(18 3/4")
Nominal Bore Size (D-0001260 only)	: 103 mm	(4-1/16")
Temperature Class T-20	: -29°C to 121°C	(-20°F to 250°F)
Rated Working Pressure	: 69.0 MPa	(10,000 psi)
Hydrostatic Test Pressure	: 103.4 MPa	(15,000 psi)
Maximum External Axial Tension	: See Note	
Maximum External Bending Moment	: See Note	
Designation of Systems	: Well Control Systems	
Type of Equipment	: Drilling / Spacer Spools	
Service	: Sour / H ₂ S	

Note: The combined internal pressure, external axial tension, and bending moment on the product is limited by the bottom end connection. Therefore, API Technical Report 6AF defines the design limitation for the combined loads on the product.

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.

Drawings:

<u>Dwg. No.</u>	<u>Rev.</u>	<u>Description</u>
D-0001245	NR	Spool, Weldment 18 3/4"-10K Flanged X 18 3/4"-10K Flanged 196.85 OAL
D-0001244	NR	Pipe, 18 3/4" 10K w/ Weld Prep, 196.85" OAL
D-0001236	NR	Flange, Weldneck w/ Weld Prep, 18 3/4 10K
D-0001247	NR	Spool, Weldment 18 3/4 10K Flanged X 18 3/4 10K Flanged 91.00" OAL
D-0001246	NR	Pipe, 18 3/4"-10K w/ Weld Prep, 91.00 OAL
D-0001236	NR	Flange, Weldneck w/ Weld Prep, 18 3/4 10K
D-0001249	NR	Spool, Weldment 18 3/4 10K Flanged X 18 3/4 10K Flanged 59.06" OAL
D-0001248	NR	Pipe, 18 3/4 10K w/ Weld Prep, 59.06" OAL
D-0001236	NR	Flange, Weldneck w/ Weld Prep, 18 3/4 10K

Job Id: **262.1-027961-1**
Certificate No: **TAD00000W4**

D-0001250 NR 18 3/4 15K X 18 3/4 10K Double Studded Adapter
D-0001260 NR 7 1/6" – 10K X 4 1/16" 10K Double Studded Adapter

Calculations:

<u>Dwg. No.</u>	<u>Rev.</u>	<u>Description</u>
BDDDB-0000032	-	18 3/4"-10K Flanged X 18 3/4"-10K Flanged 196.85 Height Design Data Book
BDDDB-0000033	-	18 3/4"-10K Flanged X 18 3/4" 10K Flanged 91.00" Height Design Data Book
BDDDB-0000034	-	18 3/4"-10K Flanged X 18 3/4" 10K Flanged 59.06" Height Design Data Book
BDDDB-0000035	-	Double Studded Adapter, DSA 18 3/4 15K X 18 3/4 10K Design Data Book
BDDDB-0000036	-	Double Studded Adatper, DSA 7 1/16 10K X 4 1/16 10K Design Data Book

Material Specifications:

<u>Component</u>	<u>Material</u>	<u>Min. Yield</u>	<u>Avg. Charpy</u>
7 1/16" X 4 1/16" Adapter	AISI 4130	75 ksi	31 ft·lbs @ -20°F
18 3/4" X 18 3/4" Adapter	AISI 4130	75 ksi	31 ft·lbs @ -20°F
BX-164 Weldneck Flange	AISI 4130	75 ksi	31 ft·lbs @ -20°F
196.85" Pipe	AISI 4130	75 ksi	31 ft·lbs @ -20°F
91.00" Pipe	AISI 4130	75 ksi	31 ft·lbs @ -20°F
59.06" Pipe	AISI 4130	75 ksi	31 ft·lbs @ -20°F

Tests carried out

1. Hydrostatic tests performed and witnessed by DNV GL under A0443734 and A0453554.

Marking of product

For traceability, the following markings shall be carried out on each product:

- Unique serialization (i.e. serial no.)
- As stated in API 16A Section 9
- According to the manufacturer's specification(s)

Comments

1. Procedures related to testing, welding, NDT, etc. are to be reviewed/approved by DNV GL's local surveyor.

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 Scheme DNVGL-CP-0338, October 2015 Edition.

END OF CERTIFICATE