



Certificate no.:
TAD00001RN

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Pipe Fitting

with type designation(s)
3"-15K OTHOS BOP PIN

issued to

Optime Subsea AS
Notodden, Norway

is found to comply with

DNV-OS-E101 – Drilling facilities, Edition July 2024

DNV statutory interpretations DNV-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2021

Application:

See next page.

Issued at **Høvik** on **2025-06-19**

This Certificate is valid until **2030-06-18**.

for **DNV**

DNV local unit: **Oslo Drilling Systems & Lifting Appliances**

Approval Engineer: **Nishant Koti**

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to USD 300 000.

Codes and Standards used as reference

ISO10423: 2009 – Petroleum and natural gas industries -Drilling and production equipment -Wellhead and Christmas tree equipment

NACE MR0175: 2015 – Petroleum and natural gas industries - Materials for use in H2S-containing environments in oil and gas production

Product description

Tubing Hanger Orientation Pin (THOP) is a tool used to orient a Tubing Hanger prior to landing in a Wellhead (WH). The pin is primarily extended or retracted within the tool by applying hydraulic pressure on actuator side. The pin also has 'spring return' functionality to ensure it will 'fail-safe' retract.

The Tool is typically installed on one of the Blowout Preventer (BOP) spare choke or kill outlets via a standard API (American Petroleum Institute) flange connection.

Application/Limitation

Type Approval documentation

Tests carried out

- Non-metallic seals has been validated in accordance with ISO 10423, Annex F PR2 performance requirement.
 - API 17G Controlled Temperature/Endurance Test, Doc#ITR-0708, dated 2025-03-31
 - API 17G Controlled Temperature and Hyperbaric Testing, Doc # ITR-0710, dated 2025-05-02
 - API 6A Annex F Validation testing of Martec Penetrator, Doc # 070214, dated 2025-06-04
- API 6A / ISO 10423 Appendix F, Immersion testing of non-metallic seals (Meldin 5301), dated 2017-07-12
- API 6A / ISO 10423 Appendix F, Immersion testing of non-metallic seals (PTFE compound A21), dated 2014-11-12
- API 6A / ISO 10423 Appendix F, Immersion testing of non-metallic seals (PTFE compound A42), dated 2017-07-12
- NORSOK M710, sour fluid resistance test of non-metallic seals (PTFE compound A42), dated 2006-03-31
- NORSOK M710, sour fluid resistance test of non-metallic seals (PTFE compound A21), dated 2006-03-31
- NORSOK M710, sour fluid resistance test of non-metallic seals (Meldin 5301), dated 2015-02-04
- API 6A, Appendix F, Immersion testing of non-metallic seals (Gazguard 7020GT), dated 2020-10-26

Tests to be carried out

Following tests to be carried out on each production of THOP:

- Charpy testing shall be performed in accordance with DNV-OS-E101, Ch.2, Sec.2.
- NDE/NDT shall be performed in accordance with DNV-OS-E101, Ch.2, Sec.8.3.
- Functional and pressure testing shall be performed in accordance with DNV-OS-E101, Ch.2, Sec.8.3.

Marking of product

Marking shall be in accordance with DNV-OS-E101, Ch.2, Sec.8.2.

Other conditions/comments

- Actuator has been validated in accordance with ISO 10423, Annex F PR2 performance requirement.
- All main load bearing components are to be delivered with 3.1 material traceability certificate per EN 10204.
- All wetted components for sour service shall be tested and verified for hardness in accordance with NACE MR-0175.
- Closure bolting delivered shall be in accordance with API 20F, BSL3 and relevant documentation shall be verified by DNV Surveyor.
- Non-metallic seals delivered shall be in accordance with DNV-OS-E101, Ch.2, Sec.2 §2.7 and relevant documentation shall be verified by DNV Surveyor.
- Fabrication records shall be maintained by the manufacturer in accordance with DNV-OS-E101, Ch.3, Sec.3.2.

Periodical assessment

For retention of the Type Approval Certificate, DNV Surveyor shall perform a survey – every second year and before expiry date of this certificate. This is in order to verify that the conditions for the type approval are complied with, ref.



Job ID: **262.1-043666-1**
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DNV-CP-0338, DNV Type approval scheme.

Manufactured by:

1. Interventek Subsea Engineering Ltd
International View, Aberdeen AB21 0BJ, United Kingdom