Certificate No:
TAD00001JH

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Well Testing Equipment

with type designation(s)
Swivel, 4-1/16"-15K

Issued to
Worldwide Oilfield Machine, Inc.
Houston, TX, USA

is found to comply with
DNV-OS-E101 – Drilling facilities, Edition July 2021
DNV statutory interpretations DNV-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2021

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Houston** on **2023-04-19**
This Certificate is valid until **2028-04-18**.
DNV local unit: **Houston, Approval CMC**

Approval Engineer: **Xiangwen Maggie Wang**

for **DNV**

Mark Miser
Head of Section

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 300,000 USD.

Product description

- WOM tubing swivel assembly AS3170 is a 4-1/16" 10K swivel assembly with 7" 4 ACME Pin on each end. The swivel is used in a flowhead well test tree to allow relative rotary movement of the inner mandrel and the lower housing.

Reference standards

- API 6A, *Specification for Wellhead and Tree Equipment*, 21st Edition
- NACE MR0175/ISO 15156, *Petroleum and Natural Gas Industries – Materials for Use in H_2S – Containing Environments in Oil and Gas Production*, 3rd Edition

Application/Limitation

- Max. Working Pressure: 15,000 psi
- Test Pressure: 22,500 psi
- Max. Tensile Load @ 15,000 psi W.P.: 300,000 lb_f
- Max. Tensile Load @ zero W.P.: 600,000 lb_f
- Max. Bending Load @ 15,000 psi W.P. only: 49,000 lb_f-ft
- Max. Bending Load @ 15,000 psi W.P. & 560,000 lbf tensional load: 29,000 lb_f-ft
- Top/Bottom Connection: 7" – 4 ACME
- Design Temperature: -20 °F to 350 °F
- Service: H_2S
- Material Class: EE
- Product Specification Level: 3G
- Designation of Systems; Type of Equipment: Well Testing; Flowhead

Type Approval documentation

Drawings:

Tests carried out

Assembly & Test Procedure, WOMUK-0152 Rev. 0, 4-1/16"-15K H_2S Swivels, WOM Part No AS3170. Test Charts Dated March 17th.

Additional manufacturing locations

1. Worldwide Oilfield Machine Pvt. Ltd.
   Gat No. 778, at Post Velu
   Pune Satara Road
   Tal. Bhor, Dist. Pune 412 205, India
2. Worldwide Oilfield Machine Ltd., UK
   7 St Machar Road
   Aberdeen, AB24 2UU
   United Kingdom

Marking of product

For traceability the following marking is to be carried out on each product:

1. Serial No.
2. Manufacturer's name or trademark.
3. Additional Marking at manufacturer's discretion.

Periodical assessment

For retention of the Type Approval, DNV's surveyor shall perform periodical assessment after 2 years (+/- 90 days) and after 3.5 years (+/- 90 days) in accordance with DNV's Class Programme DNV-CP-0338, Section 4.

Other conditions/comments

1. Procedures related to testing, welding, NDT, and other quality control requirements are to be reviewed/approved by DNV's local surveyor.
2. DNV ref.: A1347400.

END OF CERTIFICATE