



Certificate No:
TAD00001KJ

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Mud and Cementing Equipment

with type designation(s)
Man o' War Top Drive Cement Head

Issued to
Citadel Casing Solutions LLC
Houston, TX, USA

is found to comply with
DNV-OS-E201 – Oil and gas processing systems, Edition July 2022
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 **2024-08-15**

This Certificate is valid until **2029-08-14**.

for **DNV**

DNV local unit: **Houston Offshore Services**

Approval Engineer: **Marco Romero**

Sowkarthika Seetharaman
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

The Man O' War Top Drive Cement Head is used in well cementing operations to deliver cement slurry into the wellbore. The Man O' War controls and helps to measure the flow of cement and is driven/connected by the derrick drilling machine.

Reference Standards

API Specification 6A, Specification for Wellhead and Christmas Tree equipment, 21st Edition

Application/Limitation

<u>Description</u>	<u>: Value</u>
Load Cases Evaluated	
• Load Case #1	
- Maximum Working Pressure	: 10,000 psi
- Maximum Axial Load	: 2,000,000 lbf
- Maximum Torque	: 45,000 ft-lbf
• Load Case #2	
- Maximum Working Pressure	: 15,000 psi
- Maximum Axial Load	: 3,000,000 lbf
- Maximum Torque	: 0 ft-lbf
• Load Case #3	
- Maximum Working Pressure	: 0 psi
- Maximum Axial Load	: 0 lbf
- Maximum Torque	: 110,000 ft-lbf
Corrosion Allowance	: 0.06 inches
Minimum Design Temperature	: -20°F
Maximum Design Temperature	: 140°F
Designation of Systems; Equipment	: Mud and Cement Systems; Cement Head

Type Approval documentation

Tests carried out

Combine loading test was carried out successfully according to Citadel Document No. STE.00009 Rev. B and DNV witnessed and stamped Stress Engineering Services Certificate of Test Reference SES Doc. No. 2023_2137-CT-01 Rev 0

Marking of product

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

1. Serial No. which relates the equipment to certificates and manufacturing documentation.
2. Manufacturer's name or trademark
3. Additional Marking at Manufacturer's discretion.

Periodical assessment

Periodical assessments for type approvals will be required after two years (+/- 90 days) and after three-and-a-half years (+/- 90 days) in accordance with DNV-CP-0338 *September 2021*, Section 4.

Comments and other conditions

1. The design analysis is based on static conditions. Any application that has significant loads that vary with time are not covered.