

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Kill and Choke Equipment**

with type designation(s)

3-1/16" 15K DR20 Manual Choke**Part No. 2219701-11 Rev. 6****3-1/16" 15K DR20 Hydraulic Choke****Part No. 2219695-15 Rev. 6**

Issued to

Cameron, a Schlumberger Company**Aghafad, Longford Ireland,****Campina, Romania**

is found to comply with

DNVGL-OS-E101 – Drilling facilities, Edition January 2018**DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2018****Application :****See next page.**Issued at **Høvik** on **2019-07-05**This Certificate is valid until **2024-07-04**.for **DNV GL**DNV GL local station: **Oslo Drilling Systems**Approval Engineer: **Axel Janson**

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Per Esvall
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.



Reference Standards

- [1] API 16C, Specification for Choke and Kill Equipment, 2nd Edition, March 2015
- [2] API 6A, Specification for Wellhead and Christmas Tree Equipment, 21st Edition, November 2018
- [3] NACE MR0175/ISO 15156 "Sulfide Stress Corrosion Cracking Resistant Metallic Materials for Oil Field Equipment"

Application/Limitation

Manual Choke

<u>Design Parameter</u>	<u>Value</u>	<u>Equivalent</u>
Nominal Size:	77.8 mm	3-1/16"
Max. Orifice Size:	44.5 mm	1-3/4"
Max. Working Pressure:	1034 bar	15 000 psi
Temperature / Material Class:	P+U (-20 to 250 °F) / EE-NL (Sour Service)	
Temperature / Material Class:	P+X (-20 to 350 °F) / EE-360 (Sour Service)	
Product Specification Level:	3	

Hydraulic Choke

<u>Design Parameter</u>	<u>Value</u>	<u>Equivalent</u>
Nominal Size:	77.8 mm	3-1/16"
Max. Orifice Size:	44.5 mm	1-3/4"
Max. Working Pressure:	1034 bar	15 000 psi
Temperature / Material Class:	P+U (-20 to 250 °F) / EE-NL (Sour Service)	
Temperature / Material Class:	P+X (-20 to 350 °F) / EE-360 (Sour Service)	
Product Specification Level:	3	

Hydraulic Choke Actuator

<u>Design Parameter</u>	<u>Value</u>	<u>Equivalent</u>
Hydraulic Work Pressure:	103 bar	1 500 psi
Temperature Class:	U (0 to 250 °F)	
Material Class:	BB (General Service)	



Job Id: **262.1-031786-1**
Certificate No: **TAD0000153**

Type Approval Documentation

Fabrication and Testing Procedures

Test Procedures:

1. Function testing shall be carried out in accordance with DNVGL-OS-E101 Ch.2 Sec.8 §3.5.
2. Pressure testing of hydraulic system shall be performed in accordance with DNVGL-OS-E101 Ch.2 Sec.8 §3.3.
3. Charpy testing shall be performed in accordance with Ch.2 Sec.2 of DNVGL-OS-E101 Drilling Facilities.

NDE Procedures:

4. NDE/NDT shall be performed in accordance with Ch.2 Sec.8 of DNVGL-OS-E101 Drilling Facilities.

Welding Procedures:

5. Qualification of welding procedures and qualification of welders shall be in accordance with Ch.2 Sec.8 of DNVGL-OS-E101 Drilling Facilities.

Marking of Product

The chokes shall be marked in accordance with API 16C Sec.8, and shall include:

- Part No.
- Serial No.
- Pressure Rating
- Manufacturer's name or trademark

Other Conditions and Comments

- All API 6A standard component designs, such as flanges, are considered Cat. II per DNVGL-OS-E101 and these have not been verified under this TAC.
- All materials of main pressure containing components shall be supplied with material certificates according to DNVGL-OS-E101 Ch.3 Sec.2 §3.2.
- Non-metallic sealing materials shall be in accordance with DNVGL-OS-E101 Ch.2 Sec.2 §2.7.
- Fabrication records are to be maintained in accordance with DNVGL-OS-E101 Ch.3 Sec.3 §2.
- This Type Approval Certificate replaces the expired TAC D-6038.

Periodical Assessment

For retention of this Type Approval Certificate, a DNV GL representative shall carry out surveys every second year in accordance with DNV GL Type Approval Scheme DNVGL-CP-0338.

END OF CERTIFICATE