

TYPE APPROVAL CERTIFICATE

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

with type designation(s)

Choke, Adjustable 3 1/16"-15K w/Gear Operator

Issued to

Worldwide Oilfield Machine, Inc. (WOM)**HOUSTON TX, United States****PUNE, India**

is found to comply with

DNVGL-OS-E101 – Drilling plant, Edition July 2015**DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2015****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****THIS CERTIFICATE IS A RENEWAL OF D-5848.**This Certificate is valid until **2021-08-24**.Issued at **Houston** on **2016-08-25**for **DNV GL**DNV GL local station: **Approval CMC - Houston**Approval Engineer: **Xiangwen (Maggie) Wang**

Christian Nilsen
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.

Job Id: **262.1-018316-2**
Certificate No: **TAD00000F0**

Product description

- 3 1/16" 15,000 psi WP Adjustable Choke

Reference standards

- API 6A, 'Specification for Wellhead and Christmas Tree Equipment', 20th Edition
- NACE MR0175/ISO 15156, 'Petroleum and Natural Gas Industries – Materials for Use in H₂S – Containing Environments in Oil and Gas Production, 2nd Edition

Application/Limitation

- Max. Working Pressure: 15,000 psi
- Min. Design Temperature: -20 °F
- Max. Design Temperature: 350 °F
- Service: H₂S
- API 6A Material Class: DD, EE
- API 6A PSL: 3
- API 6A PR: 2

Note: DNV GL surveyor to check materials used in each project for Material Class trim.

Type Approval documentation

Drawings:

<u>Drawing No.</u>	<u>Rev.</u>	<u>Description</u>	<u>WOM's MS</u>
AE5-GE	0	Choke, adjustable 3 1/16"-15K F.E.	Assy.
WP192-1	4	Body	4.6.11/14
WP192-A	1	Body	4.6.11/14
WP192-1B	5	Inlet flange	4.6.11/14
SW3316	2	Bonnet extension	4.6.15/119/11
M0179-2	2	Wing nut	4.6.11
WA142-2A	2	Bonnet	4.6.11/14
WA142-10	9	Stem	4.6.14/6/15/119/60/71
SW4233	2	Seat	4.6.14
*WA19002(PH)-NL	0	Choke, adjustable, 3 1/16"-15k	-
*WA19002	6	Choke, adjustable, 3 1/16"-15k	-
*WA19002(PH)	7	Choke, adjustable, 3 1/16"-15k	-

*P/Ns & BOMs for information only

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 Product Certificate.

Calculations:

<u>Document No.</u>	<u>Rev.</u>	<u>Description</u>
Renewal of TAC – AE5-GE	-	Design package dated July 14 th , 2016

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Materials:

<u>Material Spec</u>	<u>Rev.</u>	<u>Description</u>	<u>Min. Yield Strength</u>	<u>Avg. Charpy @ MDT</u>
4.6.6	7	Inconel 718	120 ksi	20 ft-lbf
4.6.11	16	Alloy steel	75 ksi	20 ft-lbf
4.6.14	6	410 S.S.	75 ksi	20 ft-lbf
4.6.15	11	17-4 S.S.	105 ksi	20 ft-lbf
4.6.18	7	A193/A194 bolting	105 ksi	-
4.6.60	6	Inconel 725	120 ksi	20 ft-lbf
4.6.71	5	Inconel 625	60 ksi	20 ft-lbf
4.6.119	0	410 S.S.	85 ksi	20 ft-lbf

Tests carried out

1. Test acceptance certificate PR-2 (-20F to 450F) 3 1/16"-15K adjustable choke, P/N: M4448 S/N: A29273 dated 17th Sept. 2-12 (witnessed by GLND).

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. Marking shall be in accordance with DNVGL-OS-E101 and requirements of API 6A.

Periodical assessment

For retention of the Type Approval, DNV GL's surveyor shall perform a survey every second year in accordance with DNV GL's Class Programme DNVGL-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 GL's local surveyor.
2. DNV GL ref.: Project No. PP150835-062FF.

END OF CERTIFICATE