

# TYPE APPROVAL CERTIFICATE

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**This is to certify:**

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**That the Pipe Fitting**

with type designation(s)  
**Pipe Fittings**

Issued to

**Fluid Control AS**  
**SOLA, Norway**

is found to comply with  
**DNV-OS-E101 Drilling Plant October 2013**

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**Application :**

**See next pages.**

This Certificate is valid until **2019-12-15**.

Issued at **Høvik** on **2015-12-16**

DNV GL local station: **Stavanger**

Approval Engineer: **Nishant Koti**

for **DNV GL**

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**Per Esvall**  
**Head of Section**

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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

- API Spec. 6A, Specification for Wellhead and Christmas Tree Equipment, 20th Edition
- ASME B31.3, Process Piping, 2012 Edition
- ASME B&PV Code, Sec. VIII, Div.2 Part.5
- ASME B16.5, Pipe Flanges and Flanged Fittings, 2013
- ASME B16.9, Factory-Made Wrought Butt welding Fittings, 2012
- NACE, MR0175-2003/ISO 15156, Standard Material Requirements, Sulphide Stress Cracking Resistant Metallic Materials for Oilfield Equipment

## Product description

- This approval is towards 'pipe spools'. A typical pipe spool would include pipe, flanges and fittings. Pipe spools connect pipes with flanges at the tips so that they can be bolted to another pipe with matching flange.

## Application/Limitation

| Design Parameter           | Value                                      | (equivalent) |
|----------------------------|--------------------------------------------|--------------|
| Pipe and End Connection    |                                            |              |
| Nominal Sizes              | 2", 4", 6"                                 |              |
| Pipe Specification         | SCH 80                                     |              |
| Maximum design pressure    | 138 Bar                                    | 2000 psi     |
| Maximum test pressure      | 207 Bar                                    | 3000 psi     |
| Minimum design temperature | -46 °C                                     | -51°F        |
| Maximum design temperature | 100 °C                                     | 212°F        |
| Service                    | Sour                                       |              |
| Min. Corrosion Allowance   | 2.681 mm                                   | 0.105"       |
| Torque Rating              | 460 N-m<br>354 N-m<br>1070 N-m<br>1510 N-m |              |

| Flanges (ASME B16.5) limited to nominal sizes 2 in, 4in and 6 in | Pressure Class     | Max Pressure <sup>1, 2</sup> | Min Temp.   | Max Temp.   |
|------------------------------------------------------------------|--------------------|------------------------------|-------------|-------------|
|                                                                  | CL150              | 19.6 bar/285 Psi             | -46°C/-51°F | 100°C/212°F |
|                                                                  | CL300              | 51.1 bar/740 Psi             | -46°C/-51°F | 100°C/212°F |
|                                                                  | CL600              | 102.1 bar/1480 Psi           | -46°C/-51°F | 100°C/212°F |
|                                                                  | CL900 <sup>3</sup> | 138 bar/2000 Psi             | -46°C/-51°F | 100°C/212°F |

| Fittings (ASME B16.9) limited to nominal sizes 2 in, 4in and 6 in | Pipe Spec     | Max Pressure <sup>1, 2</sup> | Min Temp.   | Max Temp.   |
|-------------------------------------------------------------------|---------------|------------------------------|-------------|-------------|
|                                                                   | SCH # 80 only | 19.6 bar/285 Psi             | -46°C/-51°F | 100°C/212°F |
|                                                                   |               | 51.1 bar/740 Psi             | -46°C/-51°F | 100°C/212°F |
|                                                                   |               | 102.1 bar/1480 Psi           | -46°C/-51°F | 100°C/212°F |
|                                                                   |               | 138 bar/2000 Psi             | -46°C/-51°F | 100°C/212°F |

Note 1 – The max pressure stated above is only at or below temperature of 38°C/100°F.

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Certificate No: **TAD000005T**

Note 2 – The pressure rating is dependent on temperature. The de-rated pressures at high temperatures can be found in respective ASME codes.

Note 3 – CL900 flange rating is approved only up to 2000 Psi / 138 bar at 100°C.

## **Fabrication Procedures**

### **Test Procedures**

- Pressure testing to 1.5xWP shall be performed in accordance with DNV-OS-E101, Ch.2 Sec.6 §4
- Charpy testing shall be conducted at or below the minimum design temperature, and shall be in accordance with DNV-OS-E101, Ch.2 Sec.2 §2.

### **NDE Procedures**

- NDE/NDT procedures shall be in accordance with DNV-OS-E101, Ch.2 Sec.6 §3

## **Welding Procedure**

- Qualification of welding procedures and welders shall be in accordance with DNV-OS-E101, Ch.2, Sec.6 §2

## **Tests carried out**

- Prototype testing shall comply with the testing requirements noted above.

## **Marking of product**

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

- Part No.
- Serial No.
- Pipe No
- Rated Pressure Capacity
- Material Identification
- Manufacturers Name or Mark

## **Other conditions and comments**

- Materials for 'Sour service' shall meet the hardness requirements in NACE MR0175 / ISO 15156 latest edition.
- This Type Approval certificate is based on the assumption that no external loading is applied to the fittings.
- It is the responsibility of the end user to ensure that proper pipe support is in place for the piping system.
- Non-Metallic seals are not included in this Type Approval. All non-metallic seals shall be delivered with manufacturer's datasheet.
- Each product is to be surveyed during fabrication in accordance with the requirements for equipment of Category 1 as defined in DNV's Offshore Standard DNV-OS-E101 Drilling Plant, followed by issuance of Product Certificate. If the intended installation is DNV classed, then this automatically means DNV Product Certificate. Fabrication records are to be maintained in accordance with DNV-OS-E101 Ch.3, Sec.3, 2.

## **Periodical assessment**

For retention of the Type Approval, DNV GL's representative shall carry out biennial Product Audits in accordance with Standard for certification No. 1.2, Chapter 4, dated January 2013.

END OF CERTIFICATE