Certificate No:
**TAD00001GT**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Coupling**

with type designation(s)
**AQ-ConClamp #13**

Issued to
**AQUAMARINE AS**
**JØRPELAND**, **Norway**

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 :

**See page 2**

Issued at **Høvik** on **2023-02-14**
This Certificate is valid until **2028-02-13**.
DNV local station: **Oslo Drilling Systems & Lifting Appliances**

Approval Engineer: **Jan H. Hansen**

for **DNV**

**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.

## Product description

The AQ ConClamp #13 is designed to replace a standard traditional API 16A, Table 16, API 16BX Hub Clamp #13 and improve handling and safety for connecting hub-ends. This AQ ConClamp reduces the manual handling work.

## Design codes and standards used as references

- API Spec 6A, Specification for Wellhead and Christmas Tree Equipment, 20th Edition.
- API Spec 6X, Design Calculations for Pressure-Containing Equipment, 2019
- API TR 6AF2, Capabilities of API Integral Flanges Under Combination of Loading, 2018
- API Spec 16A, Specification for Drill-through Equipment, 4th Edition, April 2017.
- API Spec 20E, Alloy and Carbon Steel Bolting for Use in the Petroleum and Natural Gas Industries, 2nd Edition

## Application/Limitation

| Design Parameter | Value |
|---|---|
| Clamp reference, API 16A | Table 16, API 16BX Clamp # 13 |
| Compliant API 16A hub size | 13-5/8” 5M BX-160 |
| Rated working pressure | 345 Bar / 5000 PSI |
| Test pressure | 517 Bar / 7500 PSI |
| Design temperature | -29°C to +121°C |
| Temperature class | T -20/250 °F |

- According to API 16A, section 4.3.5.3, NACE MR0175 specifications are not required for this clamp.
- Load capacity charts can be obtained from the manufacturer.

## Type Approval documentation

## Material specification

| Component | Material | Min yield strength | Min tensile strength |
|---|---|---|---|
| Main body | ASTM A182 F22 | 551 Mpa | 689 Mpa |
| Clamp segment | 34CrNiMo6 | 724 Mpa | 861 Mpa |
| Activating screw | ASTM A320 L43 API20E BSL3 | 724 Mpa | 861 Mpa |
| Threaded sleeve | ASTM A320 L43 API20E BSL3 | 724 Mpa | 861 Mpa |
| Parking segment | AISI 4140 80K | 551 Mpa | 689 Mpa |
| Parking screw | AISI 4140 80K | 551 Mpa | 689 MPa |
| Parking threaded sleeve | AISI 4140 80K | 551 Mpa | 689 MPa |
| Parking seg end stop | S165M QT900 | 700 MPa | 900 MPa |

## Tests carried out

- Design Validation Tests including verification of load capacity diagrams, pressure, tension, and moments was carried out and witnessed by DNV. Refer DVT report TEK-PR-02 Rev 04.

## Fabrication and test procedures

- Charpy impact testing shall be performed in accordance with DNV-OS-E101, Ch.2, Sec.2, 2.6
- NDT shall be performed according to DNV-OS-E101, Ch.2, Sec.8,3.1.

## Marking of product

- Marking of the clamp body shall meet the requirements in API Spec 16A, in addition the body shall be marked with the DNV type approval certificate number, TAD00001GT.

## Periodical assessment

- Periodical assessments for Type Approvals with a validity period of five years will be required after 2 years and 3.5 years from the issue date of the Type Approval.

END OF CERTIFICATE