



Certificate No:
TAD00001FS

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Coupling

with type designation(s)
AQ-ConClamp #27

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 **2022-05-06**

This Certificate is valid until **2027-05-05**.

for **DNV**

DNV local station: **West Norway CMC**

Approval Engineer: **Jan H. Hansen**

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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.



Form code: TA 251

Revision: 2021-03

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Product description

The AQ ConClamp #27 is designed to replace a standard traditional API 16A, Table 16, API 16BX Hub Clamp #27 and improve handling and safety for connecting hub-ends. The AQ ConClamp improves safety as there is less manual handling.

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

<u>Design Parameter</u>	<u>Value</u>
Clamp reference, API 16A	Table 16, API 16BX Clamp # 27
Compliant API 16A hub sizes	18-3/4" 10M BX-164 and 21-1/4" 5M BX-165
Rated working pressure	689 bar / 10K with 18-3/4" API 16A hubs 345 Bar / 5K with 21-1/4" API 16A hubs
Test pressure	1034 Bar / 15K for all designs
Weight	2062 kg
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

<u>Component</u>	<u>Material</u>	<u>Min yield strength</u>	<u>Min tensile strength</u>
Main body	ASTM A182 F22	552 Mpa	655 Mpa
Clamp segment	34CrNiMo6	724 Mpa	862 Mpa
Activating screw	ASTM A320 L43 API20E BSL3	724 Mpa	862 Mpa
Threaded sleeve	ASTM A320 L43 API20E BSL3	724 Mpa	862 Mpa
Parking segment	AISI 4140 80K	552 Mpa	689 Mpa
Parking screw	AISI 4140 80K	552 Mpa	689 MPa
Parking threaded sleeve	AISI 4140 80K	552 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 2022-04-06. Refer 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



Job Id: **262.1-036749-1**
Certificate No: **TAD00001FS**

with the DNV type approval certificate number, TAD00001FS.

Periodical assessment

For retention of the Type Approval, DNV Surveyor shall perform a survey – every second year and before the expiry date of this certificate. This is in order to verify that the conditions for the type approval are complied with, ref. DNV-CP-0338, DNV's Type approval scheme.

END OF CERTIFICATE