



Certificate No:
TAD00001JJ

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Coupling

with type designation(s)
AQ-ConClamp #17

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

See also comment on the last page with regard to the hub design that is not part of this Type Approval.

Issued at **Høvik** on **2023-07-28**

This Certificate is valid until **2028-07-27**.

for **DNV**

DNV local unit: **Oslo Drilling Systems & Lifting Appliances**

Approval Engineer: **Jan H. Hansen**

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.

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: 2022-12

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Product description

The AQ ConClamp #17 is designed to replace a previous Cameron Iron Works CIW 20-3/4 3M Clamp # 17. These old historic clamps have never been listed in API Std 16A. The AQ-ConClamp will 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

Design limitations

Design Parameter	Value
AQ Clamp # 17 reference	CIW 20-3/4 3M Stand-Off Clamp # 17
Clamp/hub bore size	20-3/4 inch
Rated working pressure	207 Bar / 3000 PSI
Test pressure	310 Bar / 4500 PSI
Design temperature	-29°C to +121°C
Temperature class	T -20/250 °F

Load capacity charts can be obtained from the manufacturer and are shown in Figure No. 1 in the Design Report.

Type Approval documentation

Material specification

Component	Material	Min yield strength	Min tensile strength
Main body	ASTM A182 F22	551 Mpa	655 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

Tests carried out

Pressure testing of a prototype of an AQ ConClamp #17 in accordance with API Spec 16A, was carried out and witnessed by DNV 2023-07-11. Refer test procedure, Doc. No. TEK-PR-04 Rev 00.

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 shall meet the requirements in API 16A, Table 28.

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.

Comment

The old CIW (Cameron Iron Works) hub design, hub No. 20-3/4 inch 3M Stand -Off (Cameron data Sheet SK-1252 X-1095-08) was for some reasons never included and listed in API Spec 16A and does not have a DNV Type Approval.



Job Id: **262.1-039487-1**
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This historic hub has been redrawn by Aquamarine, ref. drawing AQ-036269. AQ ConClamp #17 is designed to fit a hub with the dimensions shown on drawing AQ-036269. This hub design has however not been subjected to DNV approval and this Type Approval is limited to design approval of AQ-ConClamp #17

END OF CERTIFICATE