

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Pipe System with Couplings

with type designation(s)
LORO-X, LORO-XCL

Issued to

LOROWERK K. H. Vahlbrauk GmbH & Co. KG
BAD GANDERSHEIM, Germany

is found to comply with

DNV rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV class programme DNV-CP-0185 – Type approval – Mechanical joints

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Temperature range: 0°C up to 95 °C
Max. pressure: 12 bar, with pressure pipe clip
Design: Slip-on joint

Issued at **Hamburg** on **2022-05-11**

for **DNV**

This Certificate is valid until **2027-05-10**.

DNV local station: **Hamburg – CMC North/East**

Approval Engineer: **Christian Kaemmer**

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Olaf Drews
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.



Product description

Steel pipework with slip-on socket joints made of

- LORO-X steel pipes, hot dip galvanized with additional inside coating or
- LORO-XCL stainless steel pipes.

The ends are specially formed so that the pipe ends fit together with a rubber ring as sealing-element.

Pipework may be equipped with

- LORO-anchor-clip for LORO-X / -XCL pipes against axial thrust, if pressure exceeds more than 0.5 bar.
- LORO pressure pipe clip PN12 for pipes DN50 - DN125.

Material:

LORO-X: galvanized steel pipes acc. to DIN EN 10305-3 / DIN EN 1123
 LORO-XCL: stainless steel pipes No. 1.4404/ AISI 316L No. 1.4301 / AISI 304 acc. to DIN EN 1124

Anchor-clip /
 pressure pipe clip: carbon steel, galvanized
 carbon steel, galvanized

Sealing elements:

LORO-X: SBR/NBR/EPDM/VQM
 LORO-XCL: SBR/NBR/EPDM/VQM

Vacuum pipes
 DN40 – DN70: equipped with vacuum
 sealing elements

Sizes:	Loro-X	Loro-XCL
DN40	42 x 1.5	42 x 1.0
DN50	53 x 1.5	53 x 1.0
DN70	73 x 1.6	73 x 1.2
DN80	89 x 1.6	88.9 x 1.2
DN100	102 x 2.0	101.6 x 1.2
DN125	133 x 2.5	133 x 1.5
DN150	159 x 2.5	159 x 1.5
DN200	219 x 2.9	219 x 2.0

Application/Limitation

The LORO pipe system is type-approved for pipe class III-piping systems for the following applications:

- Grey / black water drainage systems, sanitary drains and scuppers on ships located above / below freeboard deck in enclosed spaces and machinery compartments without direct overboard connection.
- Wet fire main-, deck wash-, water spray-, sprinkler- and foam firefighting systems.

Type of mechanical joint: Slip-on joint - Slip-type acc. to DNV-Rules Pt 4 Ch. 6 Sec. 9 Table 10.

Fire resistant in combination with use of LORO pressure pipe clip.

The installation of the piping system is to be carried out in accordance with the instructions of the manufacturer and DNV Rules -Part 4, Chapter 6 / Piping systems.

Type Approval documentation

- Test reports: Paconsult No. 07-1665, LGA QualiTest GmbH No.: 7381218-01, WTD 71 No. WTA 72011
- Drawings: 08070050X - 08070125X
- Installation instruction: "VL Schelle Druck/1.5"
- Loro System Description & Techn. Datasheets 21.9.21
- DNV GL-Ref.-No.: 11-070664 /
- Legacy Type Approval Certificates: 13 945-99 HH / TAP00000H5 / 12 371-98 HH
- Type Approval Assessment Report dated 2022-03-09



Job Id: **262.1-037381-1**
Certificate No: **TAP00002HS**

Tests carried out

- Vacuum tests, burst test, tightness test, pull-out test, vibration and IACS fire test
- Pressure pipe clip tested acc. to IACS UR P2.11 (Test pressure 48 bar)

Marking of product

For traceability to this Type Approval the pipe components are to be marked with:

- Manufacturer's name or trademark
- Type designation

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNV-CP-0338, Sec.4.

To check the validity of this certificate, please look it up in <https://approvalfinder.dnv.com>