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Certificate No: LR21188676TA-02

Issue Date: 25/05/2021 Expiry Date: 17/11/2023

## **Type Approval Certificate**

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

Manufacturer	LOROWERK
Address	K.H. Vahlbrauk GmbH & Co. KG, Kriegerweg 1, Bad Gandersheim, 37581, Germany
Туре	Metal Pipes
Description	Precision pipes, form pieces, deck and bulkhead penetrations from material galvanised steel, stainless steel or CuNiFe with sealing elements from either SBR, NBR, EPM, VMQ or LORO-X/VAC and LORO-XC/VAC with sealing element EPDM.
Trade Name	LORO-X, LORO-X/VAC LORO-XC, LORO-XCL, LORO-XC/VAC LORO-VAC-CuNiFe
Application	On ships and offshore installations classed or intended for Classification with Lloyd's Register as scuppers above freeboard deck and below in enclosed spaces and machinery compartments without direct overboard connection, as sanitary drain pipes for grey and black water also through critical areas, e.g. kitchens, food stores, pantries and accommodation areas. Connections through Type A-bulkheads by LORO pipe penetrations. LORO-X anchor clip is approved for use in LORO piping systems. It is furthermore approved for LORO-X and XCL piping systems intended to be used in wet fire main, deck wash-, water spray-, sprinkler and foam firefighting systems.
Specified Standard	Lloyd's Register Rules and Regulations for the Classification of Ships 2020

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**Ratings** LORO-XCL DN 40 to DN 150

LORO-X, LORO- XC DN 40 to DN 200 LORO-X/VAC and LORO-XC/VAC DN 40 to DN 70 LORO-VAC CuNiFe DN 40 to DN 50

All vacuum pipes, sizes DN 40 to DN 70 will be equipped with sealing element

EPDM, Art. No. 918 X.

LORO-X Anchor Clips for pressure pipes DN 50 – DN 125 up to 12 bar

**Other Conditions** At pressure exceeding 0.5 bar LORO securing /retaining clips are to be used

against axial thrust. For penetrations through watertight bulkheads valves with control from above WT bulkhead deck are to be fitted or for closed systems the

additional LORO-X pressure clamp may be acceptable.

This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid Certificate.

**Previous Version:** 98/20072 (E4)

The Design Appraisal Document HMD 11552-03, Issue Number 4 and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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