



TYPE APPROVAL CERTIFICATE

Certificate No:
TAF00001BZ
Revision No:
1

This is to certify:

That the Class A and B Penetration

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 class programme DNV-CP-0165 – Type approval – Cable and pipe penetrations

Application :

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

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

for **DNV**

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

DNV local station: **Essen**

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

The LORO pipe penetrations consist of metallic transition pieces, deck- & bulkhead penetration pieces, welded to a bell socket. The bell socket therefore is welded to the deck- or bulkhead division. The connection of the pipe penetrations with the LORO piping system (DNV-Type Approval Certificate No: TAP00002HS) is realized by using rubber sealing elements and secured by LORO pressure pipe clips or anchor clips, if applicable.

Socket design:

- Deck- & bulkhead penetration form T1 (socket with welded forehead plate)
- Deck penetration form R1 (socket welded directly to the pipe sleeve)
- Deck penetration combination form R1 and T1.

LORO-X:

Carbon steel elements: E195, S355J2H; hot-dip galvanized inside and outside with additional inner coating.

LORO-XCL:

Stainless steel elements: 1.4404; Welding-sleeve made of 1.4301; Internal pipe of 1.4571

Sealing elements: Nitrile Butadiene Rubber (NBR), Styrene Butadiene Caoutchouc (SBR)

Insulation: Incombustible thermal insulation (rock wool density 100 kg/m3).

Application/Limitation

The LORO-penetration system is type approved for use in A-60 decks and bulkheads, the position / orientation is specified acc. to tables 1 to 5.

Type approved for grey / black water drainage systems and scuppers on ships located above / below freeboard deck in enclosed spaces and machinery compartments without direct overboard connection.

Where pipes run through several spaces below the freeboard deck, a shut-off valve operated from above the freeboard deck has to be installed at the watertight bulkhead penetration.

On inland water way vessels, shut-off valves at watertight bulkheads can be omitted provided each pipe socket connection will be secured by LORO anchor clips.

For application at A-0 divisions: If the pipe penetration is tested as an A-60 class penetration, any insulation fitted (on the penetration itself and additionally 200 mm around) will be required to be fitted also for class A-0.

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

Test Standard

MSC.307(88) / IMO 2010 FTP Code Part 3, Test for "A", "B" and "F" class divisions, 03.12.2010.

Type Approval documentation

Deck:

Fire Test Report no. DMT-DO-53-032 dated 10.12.2015; Table 1

Fire Test Report no. DMT-DO-53-033 dated 10.12.2015; Table 2

Fire Test Report no. DMT-DO-53-034 dated 10.12.2015; Table 3

Bulkhead:

Fire Test Report no. DMT-DO-53-043 dated 10.12.2015; Table 4 & 5

Documents for the Insulations:

- MED cert. (B) no.VTT-C-8023-15-12, Paroc Group Oy., „A-60 Steel Bulkhead, Paroc Marine Wired Mat 100 or Paroc Marine Mat 100, 80/30 mm“, issued by VTT Expert Services Ltd., dd. 24.02.2012;

- VTT-C-5986-15-10, Paroc Group Oy., „A-60 Steel Deck, Paroc Marine Wired Mat 100 or Paroc Marine Mat 100, 40/40 mm“, issued by VTT Expert Services Ltd., dd. 24.09.2010;

- VTT-C-11348-15-15, Paroc Group Oy., „Paroc Marine Wired Mat 28 - 100“, issued by VTT Expert Services Ltd., dd. 11.05.2015.

Other references:

Overview of penetration bell socket forms and positions: drawings S006404 dd. 2016-01-13, S006405 dd. 2016-01-14, S006406 dd. 2016-01-15;

Table 1: Deck – A-60 class Ref. Fire Test Report no. DMT-DO-53-032

Ident. No. Test-Report	Description	Position / Orientation	Pipe /socket material	Size	Sealing	Installation-Drawings *
3	LORO-XCL	Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire nonexposed side	1.4571 / 1.4301	DN40	NBR	S902423 / S005248
5	LORO-X	Bell socket (form R1) welded on the fire exposed side. Bell opening facing the fire side	E195 / S355J2H (galvanized)	DN40	NBR	S902425 / S005253
6	LORO-XCL	Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire exposed side	1.4571 / 1.4301	DN40	NBR	S902427 / S005248
15	LORO-X	X Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire nonexposed side	E195 / S355J2H (galvanized)	DN40	NBR	S902436 / S005249
16	LORO-X	Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire exposed side	E195 / S355J2H (galvanized)	DN40	NBR	S902437 / S005249
17	LORO-XCL	Bell socket (form R1) welded on the fire exposed side. Bell opening facing the fire side	1.4571 / 1.4301	DN40	NBR	S902438 / S005252
18	LORO-XCL	Bell socket welded on the fire exposed side. Welded bell plate facing the fire exposed side	1.4571 / 1.4301	DN50	NBR	S902439 / S005260
19	LORO-X	Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire nonexposed side	E195 / S355J2H (galvanized)	DN50	NBR	S902442 / S902411
20	LORO-X	Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire exposed side	E195 / S355J2H (galvanized)	DN50	NBR	S902443 / S902411

*) Insulation: Paroc Marine Wired Mat 100, thickness: 40 mm length: 500 mm

Table 2: Deck – A-60 class Ref. Fire Test Report no. DMT-DO-53-033

Ident. No. Test-Report	Description	Position / Orientation	Pipe /socket material	Size	Sealing	Installation-Drawings *
1	LORO-X	Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire nonexposed side	E195 / S355J2H (galvanized)	DN125	SBR	S902420 / S902413
2	LORO-X	Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire exposed side	E195 / S355J2H (galvanized)	DN125	SBR	S902421 / S902413
7	LORO-XCL	Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire nonexposed side	1.4571 / 1.4301	DN200	SBR	S902428 / S005250
10	LORO-X	LORO-X Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire nonexposed side	P235TR1 / S355J2H (galvanized)	DN200	SBR	S902431 / S005251
13	LORO-X	Bell socket welded on the fire exposed side. Welded bell plate facing the fire exposed side	S355J2H / S355J2H (galvanized)	DN100	SBR	SBR S902432 / S005263
17	LORO-XCL	Bell socket (form R1) welded on the fire exposed side. Bell opening facing the fire side	1.4571 / 1.4301	DN40	NBR	S902438

*) Insulation: Paroc Marine Wired Mat 100, thickness: 40 mm, length: 1000 mm

Table 3: Deck – A-60 class Ref. Fire Test Report no. DMT-DO-53-034

Ident. No. Test-Report	Type	Position / Orientation	Pipe /socket material	Size	Sealing	Installation-Drawings *
4	LORO-X	Bell socket welded on the fire exposed side. Welded bell plate facing the fire exposed side	S355J2H / S355J2H (galvanized)	DN50	NBR	S902424 / S005261
8	LORO-XCL	Bell socket (form R1) welded at the fire exposed side. Bell socket opening facing the fire side	1.4301 / 1.4571	DN200	SBR	S902589 / S005254
12	LORO-X	Bell socket (form R1) welded at the fire exposed side. Bell socket opening facing the fire side	P235TR1 / S355J2H (galvanized)	DN200	SBR	S902435 / S005255
20	LORO-X	Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire exposed side	E195 / S355J2H (galvanized)	DN50	NBR	S902443 / S902411

*) Insulation: Paroc Marine Wired Mat 100, thickness: 40 mm, length: 1000 mm

Table 4: Bulkhead – A-60 class Ref. Fire Test Report no. DMT-DO-53-043

Ident. No. Test-Report	Type	Position / Orientation	Pipe /socket material	Size	Sealing	Installation-Drawings *
7	LORO-XCL	Bell socket welded symmetrically to the division. Welded bell plate facing the fire exposed side	1.4571 / 1.4301	DN50	NBR	S902464 C / S005261
8	LORO-XCL	Bell socket welded symmetrically to the division. Welded bell plate facing the fire nonexposed side	1.4571 / 1.4301	DN50	NBR	S902463 E / S005260
9	LORO-X	Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire exposed side	E195 / S355J2H (galvanized)	DN40	NBR	S902454 C / S005249
10	LORO-X	Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire nonexposed side	E195 / S355J2H (galvanized)	DN40	NBR	S902453 C / S005249
11	LORO-XCL	LORO-XCL Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire exposed side	1.4571 / 1.4301	DN40	NBR	S902456 C / S005248
12	LORO-XCL	Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire nonexposed side	1.4571 / 1.4301	DN40	NBR	S902455 C / S005248
13	LORO-XCL	Bell socket (Form R1) welded symmetrically to the division. Bell opening facing the fire exposed side	1.4571 / 1.4301	DN40	NBR	S902462 C / S005252
14	LORO-X	Bell socket (Form R1) welded symmetrically to the division. Bell opening facing the fire exposed side	E195 / S355J2H (galvanized)	DN40	NBR	S902461 C / S005253
15	LORO-X	Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire exposed side	E195 / S355J2H (galvanized)	DN50	NBR	S902460 F / S902411
16	LORO-X	LORO-X with pressure pipe clip on the fire side Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire nonexposed side	E195 / S355J2H (galvanized)	DN50	NBR	S902459 E / S902411
17	LORO-X	Bell socket (Form R1) welded symmetrically to the division. Bell opening facing the fire nonexposed side	E195 / S355J2H (galvanized)	DN40	NBR	S902588 B / S005253
18	LORO-XCL	Bell socket (Form R1) welded symmetrically to the division. Bell opening facing the fire nonexposed side	1.4571 / 1.4301	DN40	NBR	S902587 / S005252

Continuation Table 4: Bulkhead – A-60 class Ref. Fire Test Report no. DMT-DO-53-043

19	LORO-X	Bell socket welded symmetrically to the division. Bell opening facing the fire nonexposed side	E195 / S355J2H (galvanized)	DN50	NBR	S902451 D / S005261
20	LORO-XCL	LORO-XCL Bell socket welded symmetrically to the division. Bell opening facing the fire nonexposed side	1.4571 / 1.4301	DN50	NBR	S902452 / S005260
23	LORO-X	Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire exposed side	E195 / S355J2H (galvanized) & 1.4571 / 1.4301	DN125	SBR	S902471 F / S902413
24	LORO-X	Bell socket (form T1) welded symmetrically to the division. Welded bell plate facing the fire nonexposed side	E195 / S355J2H (galvanized) & 1.4571 / 1.4301	DN125	SBR	S902584 D / S902413

*) Insulation: Paroc Marine Wired Mat 100, thickness: 80 mm, length: 500 mm

Table 5: Pipe penetrations approved for A-30 class bulkhead only: Ref. Fire Test Report no. DMT-DO-53-043

Ident. No. Test-Report	Type	Position / Orientation	Pipe /socket material	Size	Sealing	Installation-Drawings *
1	LORO-XCL	Bell socket (form R1) welded symmetrically to the division. Bell socket opening facing the fire non-exposed side	1.4301 / 1.4571	DN200	SBR	S902586 B / S005254
2	LORO-X	Bell socket (form R1) welded symmetrically to the division. Bell socket opening facing the fire non-exposed side	S355J2H / P235TR1 (galvanized)	DN200	SBR	S902585 B / S005255
3	LORO-XCL	Bell socket (form T1) welded symmetrically to the division. Bell socket opening facing the fire exposed side	1.4301 / 1.4571	DN200	SBR	S902465 C / S005250
4	LORO-X	Bell socket (form T1) welded symmetrically to the division. Bell socket opening facing the fire non-exposed side	S355J2H / P235TR1 (galvanized)	DN200	SBR	S902469 D / 08200200X
5	LORO-X	Bell socket (form R1) welded symmetrically to the division. Bell socket opening facing the fire exposed side	S355J2H / P235TR1 (galvanized)	DN200	SBR	S902446 C / S005255
6	LORO-XCL	Bell socket (form R1) welded symmetrically to the division. Bell socket opening facing the fire exposed side	1.4301 / 1.4571	DN200	SBR	S902444 C / S005254
21	LORO-XCL	Bell socket (form T1) welded symmetrically to the division. Bell socket opening facing the fire non-exposed side	1.4301 / 1.4571	DN200	SBR	S902447 D / 08200200C
22	LORO-X	Bell socket (form T1) welded symmetrically to the division. Bell socket opening facing the fire exposed side	S355J2H / P235TR1 (galvanized)	DN200	SBR	S902448 C / 08200200X

*) Insulation: Paroc Marine Wired Mat 100, thickness: 80 mm, length: 500 mm

Marking of product

The product or packing is to be marked with name of manufacturer, type designation and fire technical rating.

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>