

# TYPE APPROVAL CERTIFICATE

**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 GL class programme DNVGL-CP-0165 – Type approval – Cable and pipe penetrations****Application :****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**Issued at **Hamburg** on **2019-11-28**for **DNV GL**This Certificate is valid until **2024-11-27**.DNV GL 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.



Job Id: **262.1-006623-3**  
Certificate No: **TAF00001BZ**

## Product description

The LORO Penetrations consist of metallic pipe (stainless steel or hot-dip galvanized carbon steel), welded to a bell socket. The bell socket is welded to the division (deck or bulkhead). The connection of the pipe penetrations with the LORO piping system is achieved using sealing elements (NBR, SBR) and in some cases additionally secured by LORO pressure pipe clamps.

LORO-X: Precision carbon steel pipe (E195, S355J2H), hot-dip galvanized inside and outside with additional inner coating.

LORO-XCL: Stainless steel pipe (mat.no. 1.4301; 1.4571);

Welded bell sockets: carbon steel, stainless steel;

Socket design arrangements in standard form T1 (socket with welded forehead plate: Loro-art.no.08200X/C), form R1 (socket welded directly to the pipe bush/sleeve: Loro-art.no.08201X/C), combination form R and T1 (Loro-art.no. 86255X/C).

Sealing elements: Nitrile Butadiene Rubber (NBR), Styrene Butadiene Copolymerisat (SBR) - (Semperit 00911.040X, 00911.050X, 00911.100X, 00911.125X, 00911.200X);

Insulation: Paroc Marine Wired Mat 100 (density 100 kg/m<sup>3</sup>). The insulation thickness and length is to be in accordance with the drawings as listed in the tables 1 up to 5.

The penetration system is approved for use in A-60 decks and bulkheads as specified in tables 1 to 5.

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.

## Application/Limitation

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

The installation of the piping systems is to be carried out in accordance with the instructions of the manufacturer respectively the installation requirements of DIN EN ISO 15749 and DNVGL Rules -Part 4 Systems and components, Chapter 6 / Piping systems.

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 securing clips.

## 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;  
 Fire Test Report no. DMT-DO-53-033 dated 10.12.2015;  
 Fire Test Report no. DMT-DO-53-034 dated 10.12.2015;

### Bulkhead:

Fire Test Report no. DMT-DO-53-043 dated 10.12.2015;

### 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**

Penetration Ident. No. acc. Test Report	Description	Position / Orientation	Pipe /socket material	Approved Size	Sealing	Drawings (installation / socket) *
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 installed on the fire exposed side	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 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

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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

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

Penetration Ident. No. acc. Test Report	Description	Position / Orientation	Pipe /socket material	Approved Size	Sealing	Drawings (installation / socket) *
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

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

<b>Penetration Ident. No. acc. Test Report</b>	<b>Description</b>	<b>Position / Orientation</b>	<b>Pipe /socket material</b>	<b>Approved Size</b>	<b>Sealing</b>	<b>Drawings (installation / socket) *</b>
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

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

Penetration Ident. No. acc. Test Report	Description	Position / Orientation	Pipe /socket material	Approved Size	Sealing	Drawings (installation / socket) *
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		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 with pressure pipe clamp on the fire side	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

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16	LORO-X with pressure pipe clamp on the fire side	LORO-X with pressure pipe clamp 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
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) and 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) and 1.4571 / 1.4301	DN125	SBR	S902584 D / S902413

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



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The following bulkhead penetrations are approved for A-30 class bulkheads only (ref. Table 5 below):

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

Penetration Ident. No. acc. Test Report	Description	Position / Orientation	Pipe / socket material	Approved Size	Sealing	Drawings (installation / socket) *
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



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### **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 GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNVGL-CP-0338, Sec.4.