



Lloyd's
Register

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.

This certificate supersedes certificate number 99/20020 (E3) issued on 29.04.2015 which is hereby cancelled.

This certificate is issued to:

PRODUCER

TPR Fiberdur GmbH & Co. KG
Industriepark Emil Mayrisch
Galileo-Allee 6
52457 Aldenhoven
Germany

DESCRIPTION

Filament wound fiber reinforced thermosetting vinylester resin pipes and fittings, conductive or non-conductive.
Joint types: conical or cylindrical adhesive bonded, laminated and flanged types, mechanical couplings and rubber seal lock joints.
WT Bulkhead penetration (NOT for passenger ships) available.
Fire barrier to be added for small sizes to obtain fire endurance level L3.

STANDARD

Lloyd's Register Rules and Regulations for the Classification of Ships,
July 2019;
IMO Resolution A 753 (18)

Certificate No. 99/20020 (E4)
Issue Date 11 July 2019
Expiry Date 31 July 2024
Sheet 1 of 5

Lloyd's Register EMEA
71 Fenchurch Street, London EC3M 4BS


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Hamburg Technical Support Office
Lloyd's Register EMEA

LR031.1.2016.06

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TYPES

Fiberdur VE = GRVE system (VE system additional liner of 0.5 mm)
Fiberdur CSVE = GRVE system (CS VE additional liner of 2.5 mm)

VE = GRVE, Conductive and non-conductive	Nominal Pressure [bar]
VE, CS VE	PN 10 or PN 16
VE Fibermarine, CS VE Fibermarine	PN 10 or PN 16
VE Fibermarine HighLine, CS VE Fibermarine HighLine	PN 16

Nominal Diameter range: DN 50 to DN 1000

APPLICATION

In ships and offshore installations classed or intended for Classification with Lloyd's Register in the following locations:
Open decks, within tanks, cofferdams, void spaces, pipe tunnels, ducts and further locations, where fire endurance tests according to Appendix 2, Level 3 and flame spread test acc. to Appendix 3 of the IMO Resolution A.753 (18) are required.

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RATINGS

Pipes structural wall thickness [mm]
(excluding internal liner 0.5 or 2.5 and top coat 0.3 mm)

DN	VE 10 CS VE	VE 16 CS VE	VE Fibermarine, CS VE Fibermarine PN10, 16 Collapse pressure 3 bar	VE Fibermarine Highline, CS VE Fibermarine Highline PN16 Collapse pressure 12 bar
50	1.6	1.6	1.6	1.6
65	1.6	1.6	1.6	1.9
80	1.6	1.6	1.6	2.3
100	1.6	1.6	1.8	2.9
125	2.0	2.0	2.3	3.6
150	1.6	2.4	2.7	4.3
200	2.0	3.2	3.6	5.7
250	2.4	3.6	4.5	7.1
300	3.2	4.8	5.3	8.5
350	4.0	5.6	6.2	9.9
400	4.0	6.4	7.1	11.3
450	4.8	7.2	8.0	12.7
500	4.8	7.2	8.8	14.2
600	5.6	8.8	10.6	17.0
700	6.4	10.2	12.4	19.8
800	7.2	12.0	14.1	22.6
900	8.0	12.8	15.9	25.4
1000	9.6	14.4	17.6	28.3

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RATINGS, cont.

Max. internal pressure (bar) depending on temperature:

Temperature:	-50 to +65°C	at 80°C	at 95°C
VE 10, CSVE 10 VE Fibermarine 10 CSVE Fibermarine	10	6	4
VE 16, CSVE 16 VE Fibermarine 16 CSVE Fibermarine 16 VE Fibermarine Highline 16 CSVE Fibermarine Highline 16	16	10	6

intermediate values may be obtained by interpolation

VE and CS VE pipes are not collapse resistant.

The Fibermarine pipe withstand full vacuum with safety factor 3:1. Collapse pressure is 3 bar.

The Fibermarine HighLine withstand full vacuum plus 3 bar external pressure with safety factor 3:1. Collapse pressure is 12 bar.

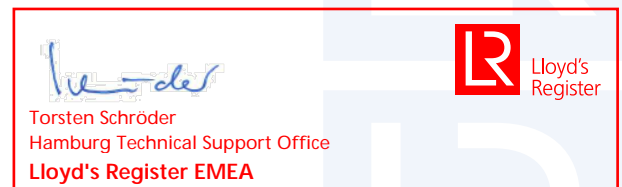
WT Bulkhead penetration (not for fire divisions) from DN 80 to DN 600,
Water tightness up to 2,5bar
Gas tightness up to 30mbar

A **Fire Barrier** to be added for L3 fire endurance level as follows:

Type of connection	Size of range DN	Fire Barrier ¹
Conical to cylindrical pipe adhesive bounded joint	25 up to 50	10 mm
	> 50 up to 100	5 mm
	> 100 up to 152	2,5 mm
	> 152	None

Footnote¹ - Final layer of VE / glass laminates

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Other Conditions

The Installation of the piping system is to be carried out by well trained personnel in accordance with the instructions and recommendations of the manufacturer respectively in accordance with the installation requirements of the IMO Resolution as applicable.

The Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.

If the specified standards are amended during the validity of this certificate, the product is to be re-approved prior to it being supplied to vessels to which the amended standards apply.

The Design Appraisal Document No. ENS 21178-08, Issue No. 3 and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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