Certificate No: LR2483864TA
Issue Date: 01/08/2024
Expiry Date: 31/07/2029

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	**TPR Fiberdur GmbH & Co. KG**
Address	Galileo Allee 6, Aldenhoven, 52457, Germany
Type	GRP Piping
Description	Glass fibre reinforced epoxy pipe system, which is filament wound and at high temperature cured, conductive or non-conductive. Joint types: conical or cylindrical adhesive bonded, laminated and flanged types, mechanical couplings and rubber seal lock joints. Fire barrier to be added for small sizes to obtain fire endurance level L3.
Trade Name	EP / CS EP FIBERMARINE & FIBERMARINE HIGHLINE & CONDUCTIVE
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.
Specified Standard	Lloyd's Register Rules and Regulations for the Classification of Ships, July 2024;

Torsten Schroeder

Engineering - Piping/ Decarbonisation - Senior Specialist to Lloyd's Register EMEA
A member of the Lloyd's Register group

71 Fenchurch Street, London, EC3M 4BS, United Kingdom

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IMO Resolution A 753 (18)

Ratings see Appendix

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.

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: LR2006694TA (99/20021(E5))

The Design Appraisal Document ENS 20450-07, Issue No. 5 and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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Appendix

TYPES

Fiberdur EP = GRE system (additional liner of 0.5 mm)
Fiberdur CSEP = GRE system (additional liner of 2.5 mm)

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

Nominal Diameter range: DN 25 to DN 1000

RATINGS

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

DN	EP 10 CS EP	EP 16 CS EP	EP Fibermarine, CS EP Fibermarine PN10, PN16 Collapse pressure 3 bar	EP Fibermarine Highline, CS EP Fibermarine Highline PN16 Collapse pressure 12 bar
25	1.6	1.6	1.6	1.6
40	1.6	1.6	1.6	1.6
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	10.4	12.4	19.8
800	7.2	12.0	14.1	22.6
900	8.0	12.8	15.4	24.9
1000	9.6	14.4	17.2	27.8

RATINGS, cont.

Max. internal pressure (bar) depending on temperature:

Temperature:	-50 to +80°C	at 95°C
EP 10, CS EP 10 EP Fibermarine 10 CS EP Fibermarine 10	10	6
EP 16, CS EP 16 EP Fibermarine 16 CS EP Fibermarine 16 EP Fibermarine Highline 16 CS EP Fibermarine Highline 16	16	10

Intermediate values may be obtained by interpolation.

EP and CS EP 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.)

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 125	2,5 mm
	> or equal to 150	None

Footnote[1] - Final layer of VE / glass laminates