

# Type Approval Certificate



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

Certificate No. 32 986 - 06 HH

Company Ameron (Pte) Ltd.  
7A Tuas Avenue 3  
Singapore 639407, SINGAPORE

Product Description Glassfibre Reinforced Plastic Pipes and Fittings ( GRP / FRP )

Type Bondstrand Series 2400, 2400C ( Conductive inside and outside )

Environmental Category None

Technical Data / TECHNICAL DATA

Range of Application  
Nominal Diameter: DN 50 to DN 900  
Piping system 2410 2412 2414 2416 2420 2425  
Design Pressure [bar] : 10 12 14 16 20 25

Resin type: Epoxy Resin System

M.A.W.T.: up to + 93°C

Electrical resistance at 20°C: <1E5 Ohm/m

Joining methods: Taper / taper bonded joint, Double O-ring expansion joint,  
Bell-Spigot (Key-Lock), Flange joint and laminated joint.

Expansion joint: Double O-Ring Joint (up to 24")

#### RANGE OF APPLICATION

In pipe class III piping systems arranged on open decks, cofferdams, void spaces, pipe tunnels, ducts and further locations where fire endurance test according to Appendix 2, Level 3 and flame spread test acc. to Appendix 3 of the IMO Resolution A.753 (18) is required. Refer to Rules I-1-2 Machinery Installation Sec. 11 U, Table 11.1a, where "L3" or "0" is indicated.

Test Standard VI-7-8 Test Requirements for Components and Systems of Mechanical Engineering:2008. Except smoke generation and toxicity test.

Documents  
- Product test reports acc. to IMO Res. 753(18), TNO test report April 1998  
- Technical report DNV /SL/R20010549  
- Bondstrand Design Manual FP707A(04/01)  
- Assembly Instructions FP 161A 11/04, Inspection&Test plan ITP-105

Remarks For the use on passenger vessels national regulations may have to be observed.

Valid until 2016-05-10

Page 1 of 2

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File No. II.C.03

Hamburg, 2011-05-31

Germanischer Lloyd

*Hanspeter Raschle*  
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For installation of plastic piping systems the following Rules and Regulations are to be observed:

- Rules for Seagoing Ships, I-1-2 Machinery Installations, Section 11 B (Plastic pipe systems).
- IMO Resolution A.753(18)

Furthermore the installation requirements of the piping system manufacturer are to be observed.

Type approved pipe couplings may be used only for compensation of thermal expansion and at location where fire endurance test according to IMO Res. 753(18) is not required. The use of pipe couplings and Double O-Ring Joint as main means of connection is not approved. The maximum nominal pressure for pipe couplings is PN 10 and for Double O-Ring PN 16.

Further Production Places:

Ameron Malaysia Sdn Bhd  
PLO 202, Senai Industrial Park Phase IV  
81400 Senai, Johor  
Malaysia

Valid until **2016-05-10**

Page **2 of 2**

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This certificate is issued on the basis of "Guidelines for the Performance of Type Approvals Part 1, Procedure".