DNV·GL

Certificate No:
TAF000016T

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Class A and B Penetration

with type designation(s)
Bondstrand GRE Watertight Bulkhead Pipe Penetration

Issued to
NOV FGS Singapore (Pte) Ltd.
Singapore, Singapore

is found to comply with
DNV GL rules for classification – Ships
DNV GL class programme DNVGL-CP-0165 – Type approval – Cable and pipe penetrations

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Issued at **Hamburg** on **2019-06-12**
This Certificate is valid until **2024-06-11**.
DNV GL local station: **Certification of Materials - Singapore**

Approval Engineer: **Hagen Markus**

for **DNV GL**

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.

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Product description

Single pipe penetration for Class A-60 and Watertight bulkhead penetration. Conduit pipe made of Bondstrand Glassfiber Reinforced Epoxy (GRE).

Design types

BHP	Reference Table 69 – Water tight bulkheads
A60 BHP	Reference Table 72 – Class A 60 bulkheads, with additional fire protection coating)

The pipe penetration consist of the following components:

Component	**Material designation**	**Reference / Remarks**
Steel pipe sleeve with doubler plate	Mild steel	Drawings Table 69, Table 72
4 pcs. Saddle Blank	GRE	
Rubber O-Rings	Neoprene Sponge Rubber or Buna-N	
Conduit pipe	Bondstrand Series S2000M (NC)	DNV GL TAK00000F3, Rev.1
	Bondstrand Series S7000M (C)	DNV GL TAK00000F4, Rev.1
	Size range O.D.: 35.6 – 1053.8	Minimum structural wall thickness according to collapse pressure of 12bar
Epoxy sealant	Epoxy Chocking Resin	Chockfast Orange
	Epoxy paste	Phillybond Orange
Additional component for Class A-60 Bulkhead Penetration		
Coating of GRE pipe on fire side	Pitt-Char PFP coating	Drawing Table 72

Production places

NOV FGS Malaysia Sdn Bhd	NOV FGS Malaysia Sdn Bhd
PLO 202, Senai Industrial Park, Phase IV	PLO79, Jalan Rumbia 2, Kompleks Perindustrian Tanjung Langsat
81400 Senai / Johor	Johor, Malaysia
Malaysia	Malaysia

Responsibility

The company NOV FGS Singapore Pte Ltd. takes the responsibility that both design and production are in compliance with the DNV GL Rules and class programme listed on page 1 of this certificate.

Application/Limitation

Type approved penetration of Class A-60 bulkheads and watertight steel bulkheads up to 17.2 bar.

For penetration of class A-0, A-15 and A-30 bulkheads penetration system is to be insulated as A-60 and in addition the penetrated division is to be insulated with A-60 insulation at least 200 mm around the penetration.

The penetration system shall not be used for penetrating boundaries of tanks.

On passenger vessels and special purpose ships (SPS), where the watertight bulkhead is also a fire division, the requirements of the SOLAS Chapter II - 1, Regulation 13.2.3. are to be observed. Application is subject to case by case approval.

Installation

Drawings	Position of the sleeve	Installation drawing
Design for GRE bulkhead penetration – Watertight Bulkhead	General application	Table 69
Design for GRE bulkhead penetrations – A60 Bulkhead	General application	Table 72

Each product shall be supplied with its manual for installation and maintenance.

Type Approval documentation

Tests carried out

Marking of product

Each penetration is to be marked to ensure traceability to this type approval certificate at least as follows

Scope	**Example**
Manufacturer name or short sign	NOV FGS Malaysia Sdn Bhd
Type designation "water tight bulkhead"	BHP
Type designation " fire division"	A60 BHP
Conduit pipe GRE System/Nominal Pipe Size /Ext pressure rating	Bondstrand Series S2000M / 1" / 4 bar

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 DNVGL-CP-0338, Sec.4.

End of certificate