



MARINE DIVISION

Certificate number: 25418/A1 BV

File number: ACM 135/0106/08

Product code: 2090H

*This certificate is not valid when presented without the full attached schedule composed of 7 sections*

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## TYPE APPROVAL CERTIFICATE

*This certificate is issued to*

**NOV FGS Singapore (Pte) Ltd**  
SINGAPORE - SINGAPORE

*for the type of product*

### THERMOSETTING MATERIAL PIPES AND FITTINGS

Bondstrand Series S5000 and S5000C Glassfiber Reinforced Vinylester (GRV) pipes and fittings

**Requirements:**

- Bureau Veritas Rules for the Classification of Steel Ships
- Bureau Veritas Rules for the Classification of Offshore Units
- IMO Resolution A.753(18)

*This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.*

**This certificate will expire on: 26 Jun 2017**

**For BUREAU VERITAS,**

At BV SINGAPORE, on 20 Dec 2013,

Shivananda Upadhyia



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine Division available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

## THE SCHEDULE OF APPROVAL

### 1. PRODUCT DESCRIPTION

#### **Bondstrand Series S5000 and S5000C Glassfiber Reinforced Vinylester (GRV) Pipes and Fittings**

- Series S5000 : Non-conductive
- Series S5000C : Conductive

##### 1.1 Product description

- Pipe: Filament-wound fiberglass-reinforced vinylester pipe with integral 0.050 inch (1.3 mm) resin-rich reinforced liner.
- Filament-wound fittings : 45° and 90° elbows, crosses, tees, tapered body reducers, flanges, nipples and couplings, and 45° laterals.
- Molded fittings : 45° and 90° elbows, tees, reducing and blind flanges, flanges with ANSI B16.1 and ANSI B16.5 drilling, plugs and end caps.
- Jointing systems: Quick-Lock straight/taper adhesive-bonded joint, flanges and flanged fittings.
- With or without conductive filaments in pipe wall (carbon fiber)

##### 1.2 Product range and rating

- Nomimal Wall Thickness

Nominal Pipe size inch (mm)	Nomimal Wall Thickness inch (mm)
2 (50)	.157 (4.0)
3 (80)	.157 (4.0)
4 (100)	.203 (5.2)
6 (150)	.203 (5.2)
8 (200)	.226 (5.7)

- Max. Working Pressure : 16 bar
- External Pressure : N/A
- Maximum Operating Temperature: 93°C
- Pipes and fittings wall electrical resistance: 1 x 10<sup>5</sup> ohm/m

### 2. DOCUMENTS AND DRAWINGS

- Bondstrand Product Data FP216F (9/97)

*No departure from the above documents shall be made without the prior consent of the Society. The manufacturer must inform the Society of any modification or changes to these documents and drawings.*

### 3. TEST REPORTS

- Tests carried out : Short-term burst test and surface flame spread characteristics (ASTM D635-06).
- Test reports : N° E98-08(S)(2), N° E046-09(S)(2), N° E046-09(S)(3), N° E046-09(S)(6), N° E106/07(M)-2, Pipe-1 (Short-term burst test) and N° 719195115-MEC11/A and B-LGJ dated 16/02/2011 (Surface flame spread characteristics (ASTM D635-06)).
- Fire endurance test not carried out.

### 4. APPLICATION / LIMITATION

- 4.1 These pipes and fittings are to be used for non-essential services and locations listed in Pt C, Ch 1, App 3 of the Society Rules where no fire endurance test is required.
- 4.2 Piping system is approved to Low Flame Spread, according to ASTM D635-06, accepted as alternative to IMO Resolution A.653(16).
- 4.3 The product (conductive) can be installed in areas that need conductive application (cargo tanks) and in fire areas (i.e. pump rooms).
- 4.4 After completion of the installation a test of conductivity is to be carried out. Earthing wires should be accessible for inspection.
- 4.5 Detailed drawings of each piping system are to be submitted for review of compliance with the Rules and the applicable regulations.
- 4.6 The pipe and fittings assembly is to be carried out in accordance with the manufacturer's instructions and the person performing these tasks is to be qualified to the satisfaction of the Society Surveyor.

4.7 Behaviour in case of fire (smoke generation and toxicity) is to be deemed satisfactory by the flag authorities of the ship on board which the piping system is fitted.

#### **5. PRODUCTION SURVEY REQUIREMENTS**

5.1 The products are to be supplied by **NOV FGS Singapore (Pte) Ltd** in compliance with the type described in this certificate and in compliance with the requirements stated on the front page of this certificate. This type of product is within the category HBV of Bureau Veritas Rule Note NR 320.

5.2 **NOV FGS Singapore (Pte) Ltd** has to make the necessary arrangements to have its works recognised by Bureau Veritas in compliance with the requirements of NR 320 for HBV products.

5.3 Each pipe and fitting is to be tested by the manufacturer at a hydrostatic pressure not less than 1.5 times the nominal pressure. Other recognised national or international standard may be accepted for pipes and fittings not employing hand lay up techniques. Depending upon the intended application the Society may require the pressure testing of each pipe and/or fitting.

5.4 No Bureau Veritas certificate is required.

#### **Place of Production**

**1) NOV FGS Singapore (Pte) Ltd**  
**7A, Tuas Avenue 3**  
**Singapore 639407**  
**SINGAPORE**

**2) NOV FGS Malaysia Sdn Bhd**  
**Plo 202 Senai Industrial Park Phase IV**  
**81400, Senai - Johor**  
**MALAYSIA**

#### **6. MARKING OF PRODUCT**

Pipes and fittings are to be permanently marked with at least:

- Manufacturer's name or logo
- Product name
- Pressure rating
- Temperature rating

The marking shall remain legible under normal handling and installation practices.

#### **7. OTHERS**

This approval is given on the understanding that the manufacturer will accept full responsibility for informing shipbuilders or their sub-contractors of the proper methods of fitting and general maintenance of the product and of the conditions of this approval.

*This certificate supersedes the Type Approval Certificate N° 25418/A0 BV issued on 26/06/2012 by the Society.*

**\*\*\* END OF CERTIFICATE \*\*\***