Certificate No: LR26357499TA
Issue Date: 19/08/2026
Expiry Date: 18/08/2031

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	**NOV FGS Malaysia Sdn Bhd**
Address	PLO 202 Senai Industrial Park Phase IV, Senai, Johor, 81400, Malaysia
Place of Production	NOV FGS Malaysia Sdn Bhd PLO 202 Senai Industrial Park Phase IV, Senai, Johor, 81400, Malaysia
Place of Production	Fiber Glass Systems (Qingdao) Composite Piping Co., Ltd Development Zone, 1 Fenhe Road, Jiao Zhou Economic & Technological, Qingdao, 266318, China
Place of Production	NOV FGS Malaysia Sdn Bhd PLO 79, Jalan Rumbia 2, Kawasan Perindustrian, Tanjung Langsat, Pasir Gudang, Johor, 81700, Malaysia
Type	Pipes and Fittings
Description	BONDSTRAND SERIES: Filament wound Fibreglass Reinforced Vinylester (GRV) pipes and fittings. End Configurations & Joining Systems 1. Quick-Lock (Adhesive Bonded) 2. Plain End (Butt & Wrap Lamination) 3. Flanged End 5000, 5000 L3-FV, 5000 FP PP B: Non-Conductive, not for piping carrying fluids capable of generating electrostatic charges (static accumulators) inside the pipe installations in hazardous areas.

Downloaded Copy

Saheli Gamare

Engineering Piping - Specialist to Lloyd's Register Marine and Offshore India LLP
A member of the Lloyd's Register group

Units 1702-1704, 17th Floor (Level-13), Building Q2, Aurum Q Parc; Gen 4/1 TTC, Thane-Belapur Road, Ghansoli, Navi Mumbai, 400710, India

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Type Approval Certificate

5000C, 5000C L3-FV, 5000C FP PP B: Conductive, for piping carrying fluids capable of generating electrostatic charges or installations in hazardous areas.

5000 L3-FV & 5000C L3-FV: GRV pipe and fitting arrangements are insulated by 3 mm Passive Fire Protection coating (Favuseal/Pittchar) & coated by paint (Jatacote Universal & Hardtop Optima) and flange joints are to be protected by Pit-Char Flange Cover.

5000 FP PP B & 5000C FP PP B: Series pipes and fittings are to be insulated by FP PP B fire protection coating. Flange joints are to be protected by Pit-Char flange cover.

Pipes: Filament-wound fiberglass-reinforced vinyl ester pipes with integral 0.050 inch (1.3 mm) resin- rich reinforced liner.

Filament-wound fittings: Tees, 90° and 45° elbows, crosses, nipples and couplings, 45° lateral, tapered body reducers

Molded fittings: Tees, 90° and 45° elbows, reducing flanges, plugs and end-caps.

Flanges: Filament-wound or molded flanges with ANSI B16.1 and ANSI B16.5 drilling, molded reducing and blind flanges

Joining systems: Quick-Lock straight/taper adhesive bonded joint featuring integral pipe stop in bell for predictable, precise laying lengths. Plain End - Butt Wrap Joint, Flanges and flanged fittings.

Field Testing: Bondstrand piping systems are to be designed for hydrostatic field testing 150% of the rated operation pressure.

Trade Name BONDSTRAND

Application **S5000 & S5000C;** Piping systems in marine and offshore applications and in

Downloaded Copy

Units 1702-1704, 17th Floor (Level-13), Building Q2, Aurum Q Parc; Gen 4/1 TTC, Thane-Belapur Road, Ghansoli, Navi Mumbai, 400710, India

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Type Approval Certificate

locations listed in Part 5,Chapter 12, Section 5, Table 12.5.1 of the Lloyd's Register's Rules and Regulations for the Classification of Ships, where fire endurance test not required ('0') is indicated.
5000 L3-FV & 5000C L3-FV, 5000 FP PPB B & 5000C FP PPB; Piping systems in marine offshore applications and in locations listed in Part 5, Chapter 12, Section 5, Table 12.5.1 of the Lloyd's Register's Rules and Regulations for the Classification of Ships, where 'L3' or '0' is indicated.

Specified Standard

Lloyd's Register's Rules and Regulations for the Classification of Ships (July 2025);
Lloyd's Register Rules and Regulations for the Classification of Offshore Units (July 2025);
IMO Resolution A.753(18); ISO 14692-2 : 2017-Annex H

Ratings

Series: S5000 & S5000C

Nominal diameter (inches):	1 to 16
Maximum working pressure :	
16 bar: 1" - 6", 12 bar: 8" - 12", 10 bar: 14" - 16",	
Maximum Operating Temperature (°C):	82
Pipe Wall Electrical Resistance (S5000C only):	less than 10^5 Ohm/m

Series: 5000 L3-FV, 5000C L3-FV, 5000 FP PPB, 5000C FP PPB

Nominal diameter (inches):	1 to 16
Maximum working pressure (bar):	
16 bar: 1" - 6", 12 bar: 8" - 12", 10 bar: 14" - 16",	
Maximum Operating Temperature (°C):	82
Pipe Wall Electrical Resistance (5000C L3-FV and 5000C FP PP B):	less than 10^5 Ohm/m
Fire Endurance Level to ResolutionA.753(18):	L3
Fire Endurance Level to ISO I4692-2:2017:	ST.IF.EB/30(3-2)

Only external coated paints (Jatacote Universal & Hardtop Optima) have been type tested for smoke generation, toxicity and surface flammability, as per Part

Downloaded Copy

Units 1702-1704, 17th Floor (Level-13), Building Q2, Aurum Q Parc; Gen 4/1 TTC, Thane-Belapur Road, Ghansoli, Navi Mumbai, 400710, India

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Type Approval Certificate

2 & Part 5 IMO FTP Code, Resolution MSC.61 (67)

Other Conditions

1. Pipes and fittings are to be selected and installed in accordance with the manufacturer's instructions and recommendations, and LR Ship Rules Part 5, Chapter 12, Sections 5 and Table12.5.1 as applicable.
2. Application in the system carrying flammable liquid is not allowed, transport of chemicals or other media is to be considered on a case by case basis.
3. The integrity of watertight bulkheads and fire division is not to be impaired. If the bulkhead or deck is also a fire division and destruction by fire of plastic pipes may cause the inflow of liquid from tanks, a metallic shut-off valve operable from above the freeboard deck is to be fitted at the bulkhead or deck.
4. Plastic piping, connections and fittings are to be electrically conductive when carrying fluids capable of generating electrostatic charges and Passing through hazardous zones and spaces, regardless of the fluid being conveyed.
5. The connection of the earthing conductor to the hull of the ship is to be made in an accessible position and the test of conductivity is to be carried out after installation of piping system.
6. The use of non-metallic pipes may be restricted by statutory requirements of the National Authority of the country in which the ship is to be registered.
7. The Pipes & fittings are to be marked with the following information:

- Manufacturer's name or trademark.
- Pressure rating
- Temperature range
- Size

Downloaded Copy

Units 1702-1704, 17th Floor (Level-13), Building Q2, Aurum Q Parc; Gen 4/1 TTC, Thane-Belapur Road, Ghansoli, Navi Mumbai, 400710, India

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Type Approval Certificate

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 Marine and Offshore India LLP of any modification or changes to the equipment in order to obtain a valid Certificate.

Previous Version: LR23370529TA-04

The Design Appraisal Document LR26357499TA and its supplementary Type Approval Terms and Conditions form part of this Certificate.

Downloaded Copy

Units 1702-1704, 17th Floor (Level-13), Building Q2, Aurum Q Parc; Gen 4/1 TTC, Thane-Belapur Road, Ghansoli, Navi Mumbai, 400710, India

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.