



## ***Confirmation of Product Type Approval 28/SEP/2011***

Please refer to the "Service Restrictions" shown below to determine if Unit Certification is required for this product.

This is to certify that, pursuant to the Rules of the American Bureau of Shipping (ABS), the manufacturer of the below listed product held a valid Manufacturing Assessment (MA) with expiration date of 27/JUL/2016. The continued validity of the Manufacturing Assessment is dependent on completion of satisfactory audits as required by the ABS Rules.

And; a Product Design Assessment (PDA) valid until 26/SEP/2016 subject to continued compliance with the Rules or standards used in the evaluation of the product.

The above entitle the product to be called Product Type Approved.

The Product Design Assessment is valid for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

### AMERON PTE LTD

**Model Name(s): Bondstrand Filament Wound, Fiberglass Reinforced Piping System - 2410, 2412, 2414, 2416, 2420, 2425; 2410C, 2412C, 2414C, 2416C, 2420C, 2425C**

**Presented to:**

AMERON PTE LTD  
7A TUAS AVENUE 3  
SINGAPORE  
Singapore

**Intended Service:**

Applications refer to 4-6-3/Table 1 of 2011 Steel Vessels Rules, 4-2-2/Table 2 of 2008 MODU Rules (Updated to 2011), Appendix 1 Section 2/Table 1 of Offshore Facilities Guide.

**Description:**

Bondstrand filament wound, fiberglass reinforced piping

**Ratings:**

2410 & 2410C: Nominal Pressure - 10 Bar(g), Temperature to 120 degree C, Nominal Diameter (in) x Min. Reinforced Wall Thickness(mm) - 2x1.8, 3x1.8, 4x1.8, 6x2, 8x2.6, 10x3.0, 12x3.4, 14x3.6, 16x4.0, 18x4.4, 20x4.9, 22x5.3, 24x5.8, 26x6.4, 28x6.9, 30x7.4, 32x7.9, 36x8.8, 40x9.8 2412 & 2412C: Nominal Pressure - 12 Bar(g), Temperature to 120 degree C, Nominal Diameter (in) x Min. Reinforced Wall Thickness(mm) - 2x1.8, 3x1.8, 4x1.8, 6x2.2, 8x2.7, 10x3.4, 12x4.0, 14x4.3, 16x5.0, 18x5.5, 20x6.1, 22x6.6, 24x7.2, 26x8.0, 28x8.6, 30x9.2, 32x9.8, 36x11, 40x12.3 2414 & 2414C: Nominal Pressure - 14 Bar(g), Temperature to 120 degree C, Nominal Diameter (in) x Min. Reinforced Wall Thickness(mm) - 2x1.8, 3x1.8, 4x1.8, 6x2.5, 8x3.2, 10x4.0, 12x4.8, 14x5.2, 16x5.9, 18x6.5, 20x7.2, 22x8.0, 24x8.8, 26x9.6, 28x10.3, 30x11.1, 32x11.8, 36x13.2, 40x14.8 2416 & 2416C: Nominal Pressure - 16 Bar(g), Temperature to 120 degree C, Nominal Diameter (in) x Min. Reinforced Wall Thickness(mm) - 2x1.8, 3x1.8, 4x2.0, 6x2.9, 8x3.7, 10x4.6, 12x5.5, 14x6.1, 16x6.9, 18x7.6, 20x8.4, 22x9.3, 24x10.1, 26x11.2, 28x12.1, 30x13, 32x13.8, 36x15.5, 40x17.3 2420 & 2420C: Nominal Pressure - 20 Bar(g), Temperature to 120 degree C, Nominal Diameter (in) x Min. Reinforced

Wall Thickness(mm) - 2x1.8, 3x1.8, 4x2.2, 6x3.3, 8x4.3, 10x5.3, 12x6.3, 14x6.9, 16x7.9, 18x8.7, 20x9.6, 22x10.6, 24x11.6, 26x12.9, 28x13.8, 30x14.8, 32x15.8, 36x17.7, 40x19.8 2425 & 2425C: Nominal Pressure - 25 Bar(g), Temperature to 120 degree C, Nominal Diameter (in) x Min. Reinforced Wall Thickness(mm) - 2x1.8, 3x2.2, 4x2.8, 6x4.1, 8x5.3, 10x6.7, 12x7.9, 14x8.7, 16x10, 18x11, 20x12.2, 22x13.4, 24x14.6, 26x16.1, 28x17.4, 30x18.6, 32x19.9, 36x22.3, 40x24.8

**Service Restrictions:**

Applications are limited to piping on open decks and within tanks, cofferdams, void spaces, pipe tunnels 2. The installation is to be in accordance with the ABS Rules/Guides, the manufacturer's recommendations, and to the satisfaction of the attending Surveyor. 3. The material of construction are to be suitable for the intended service and consistent with the manufacturer's recommendations. In accordance with 4-6-3/5.15 of Steel Vessels Rules, 4-2-2/7.5.8 of MODU Rules and Appendix 1, Section 2.15 of Offshore Facilities Guide, plastic pipes are to be electrically conductive if the pipe passes through a hazardous zone. 2400 series piping may no be used where electrically conductive piping is required. 2400C series piping is acceptable where electrically conductive piping is required. 4. These pipes and fittings are allowed to be used in locations where low flame spread characteristics of the pipes are required by 4-6-3/5.13 of Steel Vessel Rules.

**Comments:**

- Service restriction#4 is based on the Test Report No. 719188825-MEC-GZJ issued by PSB Singapore dated 07th Jan 11 and on the understanding that resin material used for all the models is same which is "Epoxy". Piping system is approved to Low Flame Spread, according to ASTM D635-06 (accepted as alternative to IMO Resolution A.653(16))". Flame spread testing in accordance with ASTM D635 may be used in lieu of the IMO flame spread test provided such testing is acceptable to the appropriate administration of the vessel's registry

**Notes / Documentation:**

This Product Design Assessment (PDA) is valid only for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

**Term of Validity:**

This Product Design Assessment (PDA) Certificate 01-SG248533/4-PDA, dated 27/Sep/2011 remains valid until 26/Sep/2016 or until the Rules or specifications used in the assessment are revised (whichever occurs first). This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product. Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA. Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

**ABS Rules:**

2011 Steel Vessel Rules 1-1-4/3.7, 2011 Steel Vessels Rules 4-6-3, 2011 MODU Rules 4-2-2/7, 2000 Offshore Facilities Guide Appendix 1

**National Standards:****International Standards:**

1. IMO Resolution A. 753(18) Level 3 Fire Endurance Test 2. ASTM Standard D635-06 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning Plastics in a Horizontal Position.

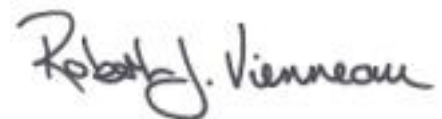
**Government Authority:****EUMED:****Others:****Model Certificate****Model Certificate No****Issue Date****Expiry Date**

PDA

01-SG248533/4-PDA

27/SEP/2011

26/SEP/2016



ABS Programs

ABS has used due diligence in the preparation of this certificate and it represents the information on the product in the ABS Records as of the date and time the certificate was printed. Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. Limited circumstances may allow only Prototype Testing to satisfy Type

Approval. The approvals of Drawings and Products remain valid as long as the ABS Rule, to which they were assessed, remains valid. ABS cautions manufacturers to review and maintain compliance with all other specifications to which the product may have been assessed. Further, unless it is specifically indicated in the description of the product; Type Approval does not necessarily waive witnessed inspection or survey procedures (where otherwise required) for products to be used in a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS. Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all cases, be addressed to ABS.