



CERTIFICATE NUMBER
15-LD1356709-PDA

DATE
21 May 2015

ABS TECHNICAL OFFICE
London Engineering Department

CERTIFICATE OF DESIGN ASSESSMENT

This is to certify that a representative of this Bureau did, at the request of

DURAPIPE UK LTD

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: **Thermoplastic Pipe, Fittings and Joints**

Model: **Series PN10 (Type S) in Metric & Inch**

This Product Design Assessment (PDA) Certificate 15-LD1356709-PDA, dated 21/May/2015 remains valid until 20/May/2020 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.

AMERICAN BUREAU OF SHIPPING

Mohammed K.M. Abbas
Engineer

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by the terms and conditions as contained in ABS Rules 1-1-A/35.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010).

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Tier: 2 - PDA Issued

Product: Thermoplastic Pipe, Fittings and Joints

Model: Series PN10 (Type S) in Metric & Inch

Intended Service:

Marine & Offshore Applications - Non-essential Systems for Fresh Water & Sea Water in accordance with 4-6-3/Table 1 of the Steel Vessel Rules.

Description:

"Durapipe ABS Type S" Metric series PN10 and Inch series. Thermoplastic Pipes, Valves and Fittings, including Caps, Tees, Elbows 45°, 90°, Sockets, Reducers, Unions & Transition Fittings, made of Acrylonitrile Butadiene Styrene (ABS) Type "S", O.D. 16 mm to 315 mm.

Rating:

Temperature rating: 0°C to 58°C.
Pressure rating: Maximum 10 bar internal pressure at 20°C.
See attachment "pdf" for pipe sizes

Service Restriction:

1. Unit Certification is not required for this product. If the manufacturer or purchaser requests an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances must be clearly defined.
2. Product is not tested for Fire Endurance. Usage limited to applications where "No Fire Endurance Test" required by 4-6-3/Table 1 of the Steel Vessels Rules (SVR).
3. Should not be used in Hazardous Area applications where electrical conductive pipes are required, as per 4-6-3/5.15 of the SVR.
4. Installation and joining procedures are to be to the satisfaction of the attending Surveyor.
5. Where Plastic Pipes are to be utilized for any installation within Tanks or other Locations which may be subject to a vacuum condition inside the pipe or a head of liquid on the outside of the pipe, external pressure is to be considered. The pipe is to be designed for an external pressure of not less than the sum of the pressure imposed by the maximum potential head of liquid outside the pipe plus full vacuum of 14.5 psi (1 bar) inside the pipe. The maximum external pressure for a pipe is to be determined by dividing the collapse test pressure by a safety factor of 3. This collapse pressure may be verified experimentally or determined by a combination of testing and calculation methods. These details are to be submitted to ABS before installation of the pipe, for ABS approval on a case by case basis.

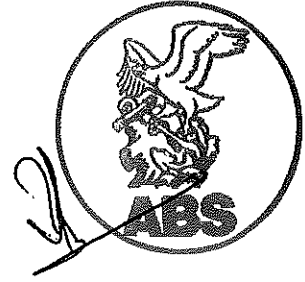
Comments:

1. All pipes and fittings are to be permanently marked with identification including pressure rating, design standard to which the pipe or fitting is manufactured, and the material with which the pipe or fitting is made.
2. All valves are to be hydrostatically tested by the manufacturer and are to bear the trademark of the manufacturer legibly stamped or cast on the exterior of the valve, as well as the pressure rating.
3. Acceptability of flame-spread test performed in accordance with ASTM D635 may be subject to approval by the Administration of the vessel's Registry.
4. For every installation, details of operating medium, maximum and operating temperatures, pressures, pipe sizes and pipe supports and fixing arrangements are to be submitted for review.
5. Pipes for potable and drinking water are to be disinfected prior to use as per manufacturer's Technical Manual,

Notes/Drawing/Documentation:

- 1) PP62298/1/OMR/05 – BITS – test reports for testing ABS Pipe and Fittings Assemblies – ASTM D2412-96 dated 26/04/2005
- 2) Report No. 42803, Project No. GL0165 – Rapra Technology Vicat Softening Temperature dated 07/05/2004

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Tier: 2 - PDA Issued

- 3) Report No. 44580, Project No GM0127 – Rapra Technology – Determination of Heat Deflection Temperature & Flame Spread dated 19/05/2005
- 4) Collapse Pressure Calculations dated 11/05/2015
- 5) ABS 'S' Material Properties Datasheet
- 6) Technical Data/Product Catalogue – Durapipe ABS including Duracool dated March 2010

Terms of Validity:

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STANDARDS

ABS Rules:

2015 Steel Vessels Rules 1-1-4/7.7, 1-1-A3, 1-1-A4, , 4-6-3/5.1, 4-6-3/5.3, 4-6-3/5.7, 4-6-3/5.13, 4-6-3/5.17 and 4-6-3/ Table 1,
2015 ABS Rules For Building and Classing Mobile Offshore Drilling Units 1-1-4/9.7, 1-1-A2, 1-1-A3, 4-2-2/7.5, 4-2-2/ Table 2

National:

ASTM D 635-03, BS 5391-1:2006, BS 5392-1:2006

International:

ISO 75-2004

Government:

NA

EUMED:

NA

OTHERS:

NA