



CERTIFICATE NUMBER

12-LD972847-PDA

DATE

13 December 2012

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
EXMAR GMBH

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: **Tube Fittings**

MODEL: **Exmar Cutting Ring Fittings and Exmar Tapered Seal Connections**


This Product Design Assessment (PDA) Certificate 12-LD972847-PDA, dated 13/Dec/2012 remains valid until 12/Dec/2017 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-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010).

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Product: Tube Fittings

Model: Exmar Cutting Ring Fittings and Exmar Tapered Seal Connections

Intended Service:

Tube fittings for marine and offshore systems

Description:

Cutting Ring Fittings: compression type tube fittings including straight fittings, equal elbows, equal tees, equal crosses, bulkhead couplings, bulkhead elbow couplings, reducing unions, tube end reducers, T-reducing fittings, straight connectors male, straight connectors female

Tapered Seal Connections: straight thread O-ring type fittings including stud standpipe adaptors, adjustable equal elbows, adjustable equal tees, adjustable male stud tee-stud barrel, straight couplings

Ratings:

Couplings are manufactured from AISI 316 Ti material. Stainless steel unions can be used up to a temperature of 400°C. Exceptions to this are soft-seal unions or tapered seal unions, which may only be used up to +200°C. Material AISI 316 Ti needs a reduction in pressure as a function of temperature. Please consult manufacturer for temperature and pressure ratings in detail.

Cutting Ring Fittings: Three ranges of couplings (LL, L and S) cover a pressure range up to 630 bar.

Serie LL: (extra light) tube diameter: 4 - 12 mm nominal pressure (PN) 100 bar

Serie L: (light) tube diameter 6 - 18 mm PN 315 bar, tube diameter 22 - 42 mm PN 160 bar

Serie S: (heavy) tube diameter 6 - 14 mm PN 630 bar, tube diameter 16 - 30 mm PN 400 bar, tube diameter 38 mm PN 315 bar

Tapered Seal Connections: Two ranges of couplings (L and S) cover a pressure range up to 630 bar.

Serie L: 6 - 18 mm PN 315 bar, 22 - 42 mm PN 160 bar

Serie S: 6 - 14 mm PN 630 bar, 16 - 30 mm PN 400 bar, 38 mm PN 315 bar

Service Restrictions:

Unit Certification is not required for this product.

Straight thread O-ring type fittings may be used for pipe connection to equipment such as pumps, valves, cylinders, accumulators, gauges and hoses, without size and pressure limitations. However, such fittings are not to be used for connecting sections of pipe as per section 4-6-7/Table 1 of the Steel Vessel Rules.

Comments:

Not Applicable

Notes / Drawings / Documentation:

IMA Dresden test report C080/11 for Exmar cutting ring couplings L- and S- Series made of stainless steel.

DNV test report_ISO 19879 dated 27 June 2012

Exmar Tube fittings catalog (XDS.VE000.000(04/2009) - EXMAR Catalogue_11)

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:

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STANDARDS

ABS Rules:

The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product. The Rules applicable to this assessment are: 2012 Steel Vessel Rules 1-1-4/7.7, 4-1-1/7.15, 4-6-7/3.5, 4-6-2/5.9

National:

NA

International:

DIN EN ISO 8434-1:2008 Metallic tube connections for fluid power and general use

Government Authority:

NA

EUMED:

NA

Others:

NA