



CERTIFICATE NUMBER

10-HG598497-1-PDA

DATE

30 June 2010

ABS TECHNICAL OFFICE

Hamburg Engineering Services

CERTIFICATE OF DESIGN ASSESSMENT

This is to Certify that a representative of this Bureau did, at the request of
METRIC FITTINGS GMBH - D-78665 FRITTLINGEN

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. It will remain valid as noted below or until the Rules or specifications used in the assessment are revised (whichever occurs first).

PRODUCT: Pipe Fittings

MODEL: ESV, WV, GSV, TV, GV, WSV, KV, WEV, GEV, TEV, LEV, TRV, EGV, EWW, ETV, ELV, MAV, MAEV, MAVD, EWVD, ETVD, ELVD, EGVD, KORV, REDV, GASV, GAIV, GRV, EWHV, DWESV, ETHV, GDVV, GEDVV, DGWSV, DGWESV.

ABS RULE: 2010 Steel Vessel Rules 1-1-4/7.7, 4-3-4/9.5.2, 4-6-1/7.5.2, 4-6-2/5.5.5, 4-6-2/5.9 (except 5.9.2(e)v)6, fire endurance test).

OTHER STANDARD DIN EN ISO 8434, DIN 2353, DIN 3859, IACS UR P2.11 (except P.2.11.5.5.6 fire endurance test).;

AMERICAN BUREAU OF SHIPPING

Hartmut Grommel

Engineering Type Approval Co-ordinator

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: Pipe Fittings

Model: ESV, WV, GSV, TV, GV, WSV, KV, WEV, GEV, TEV, LEV, TRV, EGV, EWV, ETV, ELV, MAV, MAEV, MAVD, EWVD, ETVD, ELVD, EGVD, KORV, REDV, GASV, GAIV, GRV, EWHV, DWESV, ETHV, GDVV, GEDVV, DGWSV, DGWESV.

Intended Service:

Mechanical Joints for use in shipboard piping systems, except those excluded under below Service Restrictions.

Description:

Pipe fittings, bite and compression type. Materials: Carbon Steel: C15, C22, St-37.0, St-37-2 and 9SMNPb28B (1.0718) intended for tube outside diameters from 4 mm to 42 mm.

Available product lines: LL (very light gauge), L (light gauge) and S (heavy gauge).

Sealing rings for dedicated pipe fittings,

FPM (Viton), -25°C to +200°C,

PTFE (Teflon), -60°C to +200°C or

NBR, -30°C to 120°C.

Operating temperature range of mechanical joints: -20°C to +120°C.

Ratings:

Normal working pressures defined at 20°C:

Product line LL (very light gauge):

4 mm to 8 mm tube outside diameter - 100 bar.

Product line L (light gauge):

6 mm to 10 mm tube outside diameter - 500 bar.

12 mm to 18 mm tube outside diameter - 400 bar.

22 mm to 42 mm tube outside diameter - 250 bar.

Product line S (heavy gauge):

6 mm to 10 mm tube outside diameter - 800 bar.

12 mm to 16 mm tube outside diameter - 630 bar.

20 mm to 38 mm tube outside diameter - 420 bar.

Service Restrictions:

Unit Certification is not required for this product. If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

Fittings were not tested for fire endurance. Therefore, those models that include any components which readily deteriorate in case of fire, such as FPM, PTFE, NBR seals, are not to be used in fuel-, lube-, hydraulic-, thermal oil lines-, vent lines-, fire fighting applications or any others requiring fire endurance.

Threaded couplings, type: GS-V and WS-V are not to be used in Class A/B Divisions and watertight bulkheads.

Couplings with tapered pipe threads are not to be used for toxic and corrosive fluid services and for all services of temperatures exceeding 495 degrees C. In class I and class II piping systems in general, for joining sections of pipes and for steering gear-, controllable pitch propeller-and propulsion related hydraulic systems their use is limited to the following restrictions: 4 mm to 20 mm OD for 100 bar, >20 mm to 25 mm for 82.8 bar, >25 mm to 42 mm for 41.4 bar. In other hydraulic oil systems they may be used without pressure limitation only for connection to equipment, such as pumps, valves, cylinders, accumulators, gauges and hoses.

Comments:

The application and installation of the fittings is to be in accordance with the manufacturer's specifications and instructions and is to be specifically approved in connection with the relevant piping system. Generally, care is to be taken to prevent built-up of static electricity in piping conveying fluids having flash point of 60°C or less or being routed through hazardous areas.

The wall thickness and material of the tubes used in connection with these pipe fittings is to be in accordance with

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the Bureau's current Rules. Ferrus materials used in piping systems operating at lower than -18°C are to have adequate notch toughness properties. (See 4-6-2/3.1.6 of the Rules).

Notes / Drawings / 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/model is covered under Product Design Assessment (PDA) Certificate # 10-HG598497-1-PDA, dated 30/Jun/2010. This PDA Certificate expires 29/Jun/2015. It will remain valid for 5 years from date of issue or until the Rules or specifications used in the assessment are revised (whichever occurs first). It is valid for all vessels contracted on or before the date of the Rules used in this evaluation.

STANDARDS

ABS Rules:

2010 Steel Vessel Rules 1-1-4/7.7, 4-3-4/9.5.2, 4-6-1/7.5.2, 4-6-2/5.5.5, 4-6-2/5.9 (except 5.9.2(e)v)6, fire endurance test).

National:

NA

International:

DIN EN ISO 8434, DIN 2353, DIN 3859, IACS UR P2.11 (except P.2.11.5.5.6 fire endurance test).

Government Authority:

NA

EUMED:

NA

Others:

NA