CERTIFICATE NUMBER

01-HG264952-1-PDA

DATE

04 March 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

EATON FLUID CONNECTORS GMBH - LOHMAR

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:	Tube Fitting, High Pressure Surge Resistant
MODEL:	WALFORM
ABS RULE:	2010 Steel Vessel Rules: 1-1-4/7.7, 4-6-2/5.9, 4-6-2/Table 10.
OTHER STANDARD	DIN 1630, 2391, 17458; ISO 8434-1; IACS UR P2.7.4, UR P2.11.;

AMERICAN BUREAU OF SHIPPING

H. Grommel

Hartmut Grommel

Engineering Type Approval Co-ordinator

EATON FLUID CONNECTORS GMBH
HAUPTSTR. 150
LOHMAR
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Telephone: 49-2246-12-3835
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MA Certificate No. 09-HN 1679068-X

Product: **Tube Fitting, High Pressure Surge Resistant**

Model: **WALFORM**

Intended Service:
WALFORM high pressure surge resistant tube fittings may be used for hydraulic oil, compressed air, fuel oil, lubricating oil, fresh-water, cooling and sanitary systems.

Description:
The pipe threaded connection of the type "WALFORM plus" consists of a metal seal arrangement designated as "M" and a soft seal arrangement with the designation "WD". In general the unit comprises of a double threaded union body and the nut with captive seal for type "WD" series.Tube to be shaped in a "MEG-WF-1, MEG-WF-2 or MEG-WF-3 machine thus to suit with the 24 degrees ISO 8434-1unit inside contour. For "WD" type arrangements sealing effect is achieved by a special captive seal placed in way of 24 degrees tapered section whilst the retaining function will be transmitted by the nut. Generally, the cylindrical section of the union body serves as a tube guiding element.
Materials-Tubes: A grade suitable for cold bending and flaring is to be utilised such as manufacturer's specified grade ST 37.4 or ST 52.4 (seamless steel precision tubes) according to DIN 1630, Type NBK with tolerances as per DIN 2391 or stainless steel (DIN 17495, No. 1.4571/Grade m) cold drawn, seamless and heat treated without deformation of scale with tolerances as per DIN 2391, or CuNi (70/30) or CuNiFe. Nut acc. to ISO 8434-1, Union Body (Double Male) acc. to ISO 8434-1 (24 degrees taper). Captive Seal: FPM (Viton).

Ratings:
Series L (light): 6 mm to 10 mm OD for 500 bar, 12 mm to 18 mm OD for 400 bar, 22 mm to 42 mm OD for 250 bar, 50 mm OD for 160 bar.
Series S (heavy): 6 mm to 10 mm OD for 800 bar, 12 mm to 16 mm OD for 630 bar, 20 mm to 38 mm OD for 400 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. Generally, care is to be taken to prevent build-up of static electricity in piping conveying fluids having flash point of 60°C or less or being routed through hazardous areas.

Comments:
The application and installation of the fittings is to be in accordance with manufacturer's specifications and instructions and is to be approved in conjunction with the relevant systems, whereby the pressure ratings may be required to be reduced based on actual operating parameters. Ferrous materials used in piping systems operating at lower than -18°C are to have adequate notch toughness properties (See Section 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 # 01-HG264952-1-PDA, dated 04/Mar/2010. This PDA Certificate expires 03/Mar/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, 4-6-2/5.9, 4-6-2/Table 10

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National:
DIN 1630, 2391, 17458

International:
ISO 8434-1

Government Authority:
NA

EUMED:
NA

Others:
IACS UR P2.7.4, UR P2.11.