



CERTIFICATE NUMBER
16-GE1571946-PDA

DATE
16 Nov 2016

ABS TECHNICAL OFFICE
Genoa Engineering Department

CERTIFICATE OF DESIGN ASSESSMENT

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

ALFAGOMMA INDUSTRIAL S.P.A.

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: **Non-Metallic Flexible Hose Assemblies**

Model: **415 LI, 448 LI, 615 AA, 622 AA, 648 AA, 715 AA and 748 AA**

This Product Design Assessment (PDA) Certificate 16-GE1571946-PDA, dated 16/Nov/2016 remains valid until 15/Nov/2021 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

Cristina Generale
Engineer/Consultant

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).

ALFAGOMMA INDUSTRIAL S.P.A.

NUCLEO INDUSTRIALE S. ATTO

TERAMO

Italy 64020

Telephone: +3908614421

Fax: +390396287500

Email: info@alfagomma.com

Web: www.alfagomma.com

Tier: 2 - PDA Issued

Product: Non-Metallic Flexible Hose Assemblies

Model: 415 LI, 448 LI, 615 AA, 622 AA, 648 AA, 715 AA and 748 AA

Intended Service:

“415 LI” and “448 LI” hoses: potable water transfer from Supply Vessel to Offshore Platform.

“615 AA”, “622 AA” and “648 AA” hoses: fuel, oil and liquid mud transfer up to 50% aromatics content from Supply Vessel to Offshore Platform.

“715 AA” and “748 AA” hoses: bulk material, barite and dry cement transfer from Supply Vessel to Offshore Platform.

For additional details, see Attachment (technical data sheets).

Description:

“415 LI” and “448 LI” hoses: white NR tube with high tensile textile cords reinforcement and orange NBR/PVC outer cover. Electrically discontinuous.

“615 AA”, “622 AA” and “648 AA” hoses: black conductive NBR tube with tensile textile cords reinforcement and black conductive CR outer cover. Electrically continuous.

“715 AA” and “748 AA” hoses: black conductive SBR tube with high tensile textile cords reinforcement and black conductive CR outer cover. Electrically continuous.

Hard wall, vacuum resistant hoses (415 LI, 615 AA, 622 AA and 715 AA) are additionally reinforced with embedded steel helix wires.

All flexible hoses are provided with permanently fitted threaded or flanged end fittings.

End fittings are available in S355J2H EN 10297-1, 11SMnPb30 EN 10277-1, API 5L/ASTM A106 Grade B or C20 EN 10083-2 steels or AISI 316 or AISI 316L EN 10216-5 stainless steels.

For additional details, see Attachment and reference technical drawings.

Rating:

Maximum Working Pressure: 20 bar (415 LI, 448 LI, 615 AA, 648 AA, 715 AA and 748 AA)

35 bar (622 AA ID 127)

40 bar (622 AA ID 76 and 102).

Minimum Vacuum Pressure (hard wall only): 0.1 bar.

Temperature rating: from -30 °C to + 80 °C (415 LI, 448 LI, 715 AA and 748 AA)

from -30 °C to + 90 °C (615 AA, 622 AA and 648 AA)

For additional details, see Attachment (technical data sheets).

Service Restriction:

- In accordance with Par. 5-2-2/5.7.1 of ABS Rules for Offshore Support Vessels Ed. 2016, flexible hoses intended to be used as cargo transfer hoses on ABS Classed vessels having additional Class Notation “Offshore Support Vessel”, the maximum expected service pressure of the cargo transfer system has not to exceed 1/5 of hoses burst pressure.

- Flexible hoses are not suitable for the transfer of limited amounts of hazardous and noxious liquid substances as listed in 5-2-3/Table 1 of ABS Rules for Offshore Support Vessels, Ed. 2016.

- Flexible hoses are not to be used for installations in piping systems where pressure pulse and/or high levels of vibrations are expected to occur in service as per Par. 4-6-2/5.7.3 of ABS Rules for Steel Vessels, Ed. 2016.

- Flexible hoses intended to be used for transfer of flammable media (615 AA, 622 AA and 648 AA) are not to be installed in on-board piping systems.

- Flexible hoses are to be complete with factory assembled end fittings or factory supplied end fittings installed in accordance with Manufacturer's specifications as per Par. 4-6-2/5.7.3(b) of ABS Rules for Steel Vessel, Ed. 2016.

- Hose assemblies are to be installed only where flexibility is required, in clearly visible and readily accessible locations, and are not to be subject to torsional deflection under normal conditions.

- 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.

ALFAGOMMA INDUSTRIAL S.P.A.

NUCLEO INDUSTRIALE S. ATTO

TERAMO

Italy 64020

Telephone: +3908614421

Fax: +390396287500

Email: info@alfagomma.com

Web: www.alfagomma.com

Tier: 2 - PDA Issued

Comments:

- 1) Routine tests as per Annex H of EN 1765:2004 Standard and Production Acceptance Tests as per Alfagomma Table 4/Q/TA/40/00 dated 4/10/2016 to be carried out, as applicable.
- 2) Flexible hoses are to be permanently marked by the Manufacturer, as per 4-6-2/5.7.6 of ABS Steel Vessel Rules Ed. 2016, with the following details:
 - Hose Manufacturer's name or trademark;
 - Date of manufacture (month/year);
 - Designation type reference;
 - Nominal diameter;
 - Pressure rating;
 - Temperature rating.
- 3) Electrically discontinuous hose assemblies (415 LI and 448 LI) shall have, in addition, the words "ELECTRICALLY DISCONTINUOUS" in legible characters permanently displayed onto the body of the hose.
- 4) Black hoses (615 AA, 622 AA, 648 AA, 715 AA and 748 AA) have been found in compliance with flammability test as per Annex A of EN 1762 Standard.
- 5) Orange hoses (415 LI and 448 LI) have been found in compliance with the requirements of the FDA – CFR 21 – Parts 170 to 199 – Item 177.2600 Paragraph (a), (b), (c), (d) of the use in contact with dry foods, (e) of the contact with aqueous foods, (f) of the contact with fatty foods.
- 6) Hard wall hoses 415 LI, 615 AA and 715 AA are also available in self-floating version with a reserve of buoyancy calculated in accordance with Par. 1.7.4 of OCIMF Guide to Manufacturing and Purchasing Hoses for Offshore Moorings.
- 7) Only Alfagomma approved ferrules and inserts are to be used for end fittings, as per Manufacturer's recommendations.
- 8) The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

Notes/Drawing/Documentation:

For Flexible Hoses Technical Data Sheets, see Attachment.

For End Fittings Technical Drawings, see Attachment.

Hose Test Report No. 415LI102-102016 dated 14-Oct-2016;
Hose Test Report No. 448LI102-102016 dated 13-Oct-2016;
Hose Test Report No. 615AA203-102016 dated 14-Oct-2016;
Hose Test Report No. 622AA102-102016 dated 14-Oct-2016;
Hose Test Report No. 622AA127-102016 dated 14-Oct-2016;
Hose Test Report No. 648AA102-102016 dated 17-Oct-2016;
Hose Test Report No. 648AA152-102016 dated 20-Oct-2016;
Hose Test Report No. 715AA127-102016 dated 14-Oct-2016;
Hose Test Report No. 748AA127-102016 dated 14-Oct-2016;
Adhesion Test Report No. ADH415LI-448OI dated 29-Aug-2016;
Adhesion Test Report No. ADH615AA-622AA-648AA dated 29-Aug-2016;
Adhesion Test Report No. ADH715AA-748AA dated 27-Aug-2016;
Alfagomma Declaration about Test Reports on Tube and Cover Compounds dated 27-Sep-2016;
Tensile Test Report No. 2016/10/0115 dated 12-Oct-2016;
Tensile Test Report No. 2016/11/0037 dated 4-Nov-2016;
LAPI Flammability Test Report No. 1381/OMP0110/15 dated 18-Sep-2015;
CERISIE Declaration No. 642-Abis/2011 dated 1-Jan-2012;
Alfagomma Table No. 4/Q/TA/40/00 – Control Specification Off Shore AG 1765 dated 4-Oct-2016.

Terms of Validity:

This Product Design Assessment (PDA) Certificate 16-GE1571946-PDA, dated 16/Nov/2016 remains valid until 15/Nov/2021 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

ALFAGOMMA INDUSTRIAL S.P.A.

NUCLEO INDUSTRIALE S. ATTO

TERAMO

Italy 64020

Telephone: +3908614421

Fax: +390396287500

Email: info@alfagomma.com

Web: www.alfagomma.com

Tier: 2 - PDA Issued

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.

STANDARDS

ABS Rules:

- Rules for Condition of Classification (2016): 1-1-4/7.7, 1-1-A3 and A4, which covers the following:
- Rules for Building and Classing Steel Vessels (2016): 4-6-2/5.7;
- Rules for Building and Classing Offshore Support Vessels (2016): 4-6-2/5.7, 5-2-2/5.7;
- Rules for Building and Classing Steel Vessels Under 90 Meters (295 Feet) in Length (2016): 4-4-1/9.19;
- Rules for Conditions of Classifications – Offshore Units and Structures (2016): 1.1.4/9.7, 1-1-A2 and A3, which covers the following:
- Rules for Building and Classing Mobile Offshore Drilling Units (2016): 4-2-1/11.29

National:

NA

International:

NA

Government:

NA

EUMED:

NA

OTHERS:

Alfagomma Technical Specifications (as applicable):

- 415 LI, Rev. 4 dated 16/09/2016;
- 448 LI, Rev. 3 dated 16/09/2016;
- 615 AA, Rev. 4 dated 16/09/2016;
- 622 AA, Rev. 3 dated 16/09/2016;
- 648 AA, Rev. 3 dated 16/09/2016;
- 715 AA, Rev. 3 dated 16/09/2016;
- 748 AA, Rev. 3 dated 19/09/2016.

The above Specifications also recall main design and testing criteria of BS EN 1765:2004 Standard.