CERTIFICATE NUMBER	25-0388568-PDA-DUP
EFFECTIVE DATE	10-Dec-2025
EXPIRY DATE	09-Dec-2030
ABS TECHNICAL OFFICE	Houston ESD - Piping

CERTIFICATE OF

Product Design Assessment

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

HOSE MASTER, LLC

located at

750 VISTA BLVD., , SPARKS, NV, United States, 89434

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:	**Flexible Metal Hose Assemblies**
Model:	**Annuflex, Masterflex, Pressuremax, ChemKing**
Endorsements:	
Tier:	**3 - Type Approved, unit certification not required**

This Product Design Assessment (PDA) Certificate remains valid until 09/Dec/2030 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping

Electronically Signed by:

John Vincent B. Ulep/ Senior Principal 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 ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

Sensitivity: Internal & Restricted

HOSE MASTER, LLC
750 VISTA BLVD.
SPARKS NV
United States 89434
Telephone: 800-221-23319
Fax: 216-481-7557
Email: WebSales@hosemaster.com
Web: www.hosemaster.com

Tier: 3 - Type Approved, unit certification not required

Product: **Flexible Metal Hose Assemblies**
Model: **Annuflex, Masterflex, Pressuremax, ChemKing**
Endorsements:

Intended Service:
Marine and Offshore Applications
Especially, Annuflex 4", 6", 8" & 10" T304 Double Braided T316L Corrugated Hoses (Models: AF57550400, AF57550600, AF57550800 & AF57551000) also for LNG cargo.

Description:
Flexible Metal Hose Assemblies.

Rating:
See the attached document for Annuflex, MasterFlex, PressureMax & ChemKing Hose Maximum Pressure Ratings, Size, etc.
Annuflex 4", 6", 8" & 10" T304 Double Braided T316L Corrugated Hoses (Models: AF57550400, AF57550600, AF57550800 & AF57551000) also for LNG cargo: -165 deg. C to 50 deg. C up to 150 psi

Service Restriction:
1-1) 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.
1-2) With regard to Annuflex 4", 6", 8" & 10" T304 Double Braided T316L Corrugated Hoses (Models: AF57550400, AF57550600, AF57550800 & AF57551000) for cryogenic services, each new length of cargo hose produced shall be hydrostatically tested at ambient temperature to a pressure not less than 1.5 times its specified maximum working pressure, but not more than two fifths of its bursting pressure. The hose shall be stenciled, or otherwise marked, with the date of testing, its specified maximum working pressure and, if used in services other than ambient temperature services, its maximum and minimum service temperature, as applicable per 5C-8-5/11.7.3 of MVR.
2) Prior to installation, each type of hose/fitting combination (eg. assembly) is to be subject to prototype testing to the same standard as that required by the hose with particular reference to pressure and impulse tests. The approved end fittings are to be installed in accordance with manufacturer’s specifications and procedures, as per 4-6-2/5.7.3 (b) of the Marine Vessels Rules
3) The type of end connections utilized (e.g. threaded, flanged, etc.) are to comply with the applicable requirements and limitations in the Rules.
4) Hose assemblies are to be installed only when flexibility is required and are not to be subject to torsional deflection under normal conditions. In addition, the length of the hose is to be limited to that required for flexibility only.

Comments:
1) The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.
2) Flexible hoses are to be permanently marked by the manufacturer with the following details per MVR 4-6-2/5.7.6: Hose manufacturer’s name or trademark, Date of manufacture (month/year), Designation type reference, Nominal diameter, Pressure rating and Temperature rating.

Notes/Drawing/Documentation:
Drawing No. Annuflex Catalog Sheets, Rev. 2
Drawing No. Chemking Catalog Sheets, Rev. 2
Drawing No. Fittings Catalog Sheets,
Drawing No. Masterflex Catalog Sheets;
Drawing No. Pressuremax Catalog Sheets
Drawing No. Burst and Deformation Testing dated 5 November 2008;
Drawing No. Assembly Prep for Testing dated 27 May 2005;
Drawing No. Recording and Generating Pressure Test Analysis Results dated 19 December 2006;
Drawing No. Analysis of Burst Deformation Chart dated 27 May 2005;

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Tier: 3 - Type Approved, unit certification not required

Drawing No. Pulse Test Report for Annuflex 8" hose by Hose Master dated 23 July 2019;
Drawing No. Pulse Test Report for Annuflex 4", 6" & 10" by Hose Master dated 29 October 2020;
Drawing No. ABS Cryogenic prototype test report for Annuflex 8" dated 02 August 2019;
Drawing No. ABS Burst Test Report for Annuflex 8" at Upper Temperature Limit dated 17 October 2019;
Drawing No. ABS Cryogenic and burst prototype test report for Annuflex 4", 6" & 10" dated 14 August 2020;
Drawing No. Burst Test Report 1906-221N at Lower Temperature Limit by Keystone Compliance for Annuflex 8", Rev. B dated 25 June 2019;
Drawing No. Burst Test Report 1906-247NB at Lower Temperature Limit by Keystone Compliance for Annuflex 4", 6" & 10", Rev. A dated 10 August 2020

Terms of Validity:
This Product Design Assessment (PDA) Certificate remains valid until 09/Dec/2030 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

STANDARDS

ABS Rules:
2025 Rules for Conditions of Classification, 1A-1-4/7.7, 1A-1A-A3,1A-1-A4, which covers the following:
2025 Rules for Building and Classing Marine Vessels: 4-6-2/5.7 and 5C-8-5/11.7

2025 Rules for Conditions of Classification, Offshore Units and Structures, 1B-1-4/9.7, 1B-1-A2, 1B-1-A3, which covers the following:
2025 Rules for Building and Classing Mobile Offshore Units: 4-2-1/11.29

National:
NA

International:
NA

Government:
NA

EUMED:
NA

OTHERS:
NA