



Confirmation of Product Type Approval

Company Name: DANFOSS POWER SOLUTIONS II, LLC

Address: 1225 WEST MAIN STREET VAN WERT OH 45891 United States

Product: Non-Metallic Flexible Hose Assemblies

Model(s): FC234, FC254 (AE374), FC279, FC300 (AE372), FC350, FC606, GH195, GH493, GH663, GH781, 2807, 2808, FC849, H430, H190, H280, H290H

Endorsements:

Certificate Type	Certificate Number	Issue Date	Expiry Date
Product Design Assessment (PDA)	22-WO0022504-1-PDA	27-JUN-2024	12-DEC-2027
Manufacturing Assessment (MA)	23-6055863	23-OCT-2023	22-OCT-2028
Product Quality Assurance (PQA)	NA	NA	NA

Tier

3 - Type Approved, unit certification not required

Intended Service

Marine & Offshore Application - Fuel Oil, Lubricating Oil, Hydraulic Fluid, Water & Air Systems. See Ratings section for details.

Description

Hydraulic Flexible Hoses

Ratings

FC234

-40°C to +150°C (-40°F to +302°F)

Application: Diesel fuel, gasoline, Hot lube oil, Water

FC254

-40°C to +126°C (-40°F to +260°F)

Application: Hydraulic system service with petroleum and water based fluids, For general industrial use

FC279

-40°C to +135°C (-40°F to +275°F)

Application: High temperature lubricating and hydraulic oil.

FC300

-50°C to +150°C (-58°F to +302°F)

Application: Hydraulics handling petroleum base fluids, Air, gasoline, fuel and lubricating oils, fire resistant hydraulic fluids and other industrial fluids

FC350

-50°C to +150°C (-58°F to +302°F)

Application: Air, gasoline, fuel, lubricating oils and coolants

FC606

-40°C to +121°C (-40°F to +250°F)

Application: High-pressure hydraulics, hydrostatic transmissions, Hydraulic system service with petroleum and water based fluids for general industrial use

FC849

-40°C to +100°C (-40°F to +212°F)

Application: Hydraulic system applications with petroleum and water-based fluids

GH195

-40°C to + 150°C (-40°F to + 302°F)

Application: Petroleum and fire resistant hydraulic fluids, fuel, and lubricating systems

GH493

-40°C to +126°C (-40°F to +260°F)

Application: Hydraulic systems service with petroleum and water based fluids, for general use.

GH663

-46°C to +126°C (-50°F to +260°F)

Hydraulic system service with petroleum and water based fluids, for general industrial service

GH781

-46°C to +126°C (-50°F to +260°F)

Application: High pressure hydraulic systems with petroleum and water-glycol base fluids, for lubricating oils and water.

2807

-73°C to +260°C (-100°F to +500°F) Steam 200 psi at +388°F max

Application: Ideal for steam, compressor discharge, and virtually all chemical applications. Not

recommended for steam-cold water cycling.

2808

-73°C to +260°C (-100°F to +500°F)

Application: Hot air, steam and most chemical applications

H290H

-40°C to +150°C (-40°F to +302°F)

Application: Hydraulics, crude, fuel and lubricating oils, gasoline, water, and phosphate ester based hydraulic fluids.

H430

-40°C to +126°C (-40°F to +260°F)

Application: Hydraulic system service with petroleum and water based fluids, for general use.

H190

Petroleum based Hydraulic fluids: -46°C to +126°C (-50°F to +260°F) Water-based Hydraulic Fluids: -46°C to +126°C (-50°F to +260°F) Water: 0°C to 70°C (+32°F to +158°F)

Application: Hydraulic system service with petroleum and water-based fluids

H280

Petroleum based Hydraulic fluids: -46°C to +126°C (-50°F to +260°F) Water-based Hydraulic Fluids: -46°C to +70°C (-50°F to +158°F) Water: 0°C to 70°C (+32°F to +158°F)

Application: Hydraulics, construction, agriculture.

Service Restrictions

- 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.
- 2) The types of end connections utilized (e.g. threaded, flanged, etc.) are to comply with the applicable requirements and limitations of the 2024 ABS Rules for Building and Classing Marine Vessels 4-6-2/5.7.3 b)
- 3) Flexible Hose are not acceptable in high pressure fuel oil injection systems.
- 4) Flexible Hose assemblies are not applicable to hoses intended to be used in fixed fire extinguishing systems.
- 5) GH195 -04, -08 are not to be used in Fire Resistance or Flammable Service.
- 6) The brass fittings are not used on hoses for flammable oils.
- 7) Restrictions of Taper Thread Joints in Hydraulic Systems for Steering Gear, Controllable Pitch Propellers, or other Systems associated with Propulsion or Propulsion Control are applicable per 2024 ABS Rules for Building and Classing Marine Vessels 4-6-2/5.5.5
- 8) Split Flanges are not permitted in Steering Gear System, Certified Thruster Systems, nor in Systems

which are vital to the propulsion or safety of the vessel per 2024 ABS Rules for Building and Classing Marine Vessels 4-6-7/3.5.1.

9) For the U.S. Flag vessels, hose assemblies may be installed only in vital and non-vital fresh and salt water systems, non-vital pneumatic systems, lube oil and fuel systems, and fluid power system in accordance with 46 CFR 56.60-25(b).

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: Hose manufacturer's name or trademark, Date of manufacture (month/year), Designation type reference, Nominal diameter, Pressure rating and Temperature rating, in accordance with 2024 Rules for Building and Classing Marine Vessels 4-6-2/5.7.6.

3) The hoses are to be complete with factory assembled end fittings or factory supplied ends installed in accordance with manufacturer's procedures in accordance with 2024 Rules for Building and Classing Marine Vessels 4-6-2/5.7.3 (b)

4) Note that only Danfoss approved steel/stainless steel and brass crimp or reusable fittings are approved for use with subject hoses.

5) Hose assemblies are to be installed only where flexibility is required and are not to be subject to torsional deflection under normal conditions in accordance with 2024 Rules for Building and Classing Marine Vessels 4-6-2/5.7.4

Notes, Drawings and Documentation

Drawing No. H190, Weatherhead Hose 1 Wire Braid Reinforcement, Rubber Cover, Revision: T, Pages: 1

Drawing No. FC279, Aeroquip Hose 1 Wire Braid Reinforcement, Rubber Cover, Revision: F, Pages: 1

Drawing No. GH195, Aeroquip Hose Two Wire Braid, Rubber Cover, Revision: K, Pages: 1

Drawing No. FC254, Aeroquip Hose 4 Wire Reinforcement, Rubber Cover, Revision: AH, Pages: 1

Drawing No. FC606, Aeroquip Hose 6 Wire Reinforcement, Rubber Cover, Revision: H, Pages: 1

Drawing No. H430, Weatherhead Hose 4 Wire Spiral, Rubber Cover, Revision: M, Pages: 1

Drawing No. 2807, Hose Medium Pressure PTFE Tube, Revision: U, Pages: 1

Drawing No. 2808, Hose Medium Pressure PTFE Tube, Revision: P, Pages: 1

Drawing No. FC300, Aeroquip Hose Polyester & Wire Reinforced, Polyester Cover Air Brake, Revision: AN, Pages: 1

Drawing No. H280, Weatherhead Hose 2 Wire Braid, Rubber Cover, Revision: V, Pages: 1

Drawing No. FC234, Aeroquip Hose, 2 Wire Braid Reinforcement, Polyethylene Cover, Revision: P, Pages: 1

Drawing No. GH493, Aeroquip Hose 4 Heavy Wire Spiral, Rubber Cover, Revision: Y, Pages: 1

Drawing No. FC350, Aeroquip Hose Wire Reinforcement, Polyester Cover, Revision: AA, Pages: 1

Drawing No. ES 2870, Hose and Hose Assemblies Using GH781, H280 and GHH814 Hose, Functional and Performance Requirements, Revision: AE, Pages: 16

Drawing No. GH781, Aeroquip Hose 2 Wire Braid, Rubber Cover, Revision: AG, Pages: 1

Drawing No. FC849, Aeroquip Hose 2 Wire Braid Reinforcement, Rubber Cover, Revision: K, Pages: 1

Drawing No. H290H, Weatherhead Hose 2 Wire Braid, Rubber Cover, Revision: D, Pages: 1

Drawing No. GH663, Aeroquip Hose 1 Wire Braid Reinforcement, Rubber Cover, Revision: T, Pages: 1

Drawing No. ES 1566, Hose and Hose Assemblies Using FC300 and H569 Hose, Functional and Performance Requirements, Revision: V, Pages: 14

Report No. 224773, Summary Report of Eaton Aeroquip FC-300-04, FC300-05, FC300-6, FC300-08, FC300-10, FC300-12, FC300-16, FC300-20, FC300-24, FC300-23, FC-400-40 Hose Performance for American Bureau of Shipping 2007 Product Design Assessment, 03-HS215533/2-PDA, Date: 05/29/2007, Revision: -, Pages: 12

Term of Validity

This Product Design Assessment (PDA) Certificate remains valid until 12/Dec/2027 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.

ABS Rules

2024 Rules for Conditions of Classification: 1A-1-4/7.7, 1A-1-A3 and A4, which covers the following:

2024 ABS Rules for Building and Classing Marine Vessels: 4-6-2/5.7

2024 Rules for Conditions of Classification - Offshore Units and Structures: 1B-1-4/9.7, 1B-1-A2 and A3, which covers the following:

2024 Rules for Building and Classing Mobile Offshore Drilling Units: 4-2-1/11.29

International Standards

ISO 15540 (2016), ISO 15541 (2016), ISO 11237 (2017); ISO 1436 (2020)

EU-MED Standards

N/A

National Standards

SAE J517(2020), SAE J516 (2021);

EN 853 (2016) ; EN857 (2016)

Government Standards

46 CFR 56.60-25 (b)

Other Standards

N/A



A handwritten signature in dark ink, appearing to read "Joseph W. Wilson".

Corporate ABS Programs
American Bureau of Shipping
Print Date and Time: 01-Jul-2025 5:13

ABS has used due diligence in the preparation of this certificate, and it represents the information on the product in the ABS Records as of the date and time the certificate is printed.

If the Rules and/or standards used in the PDA evaluation are revised or if there is a design modification (whichever occurs first), a PDA revalidation may be necessary.

The continued validity of the MA is dependent on completion of satisfactory audits as required by the ABS Rules. The validity of both PDA and MA entitles the product to receive a **Confirmation of Product Type Approval**.

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 prior to the effective date of the ABS Rules and standards applied at the time of PDA issuance. ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. The manufacturer is responsible to maintain compliance with all specifications applicable to the product design assessment. Unless specifically indicated in the description of the product, certification under type approval does not waive requirements for witnessed inspection or additional survey for product use on a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all cases, be addressed to ABS.