



CERTIFICATE NUMBER
16-HS1523876-PDA

DATE
07 Jun 2016

ABS TECHNICAL OFFICE
Houston OED - Systems

CERTIFICATE OF DESIGN ASSESSMENT

This is to certify that a representative of this Bureau did, at the request of
PARKER HANNIFIN CORP.

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 Hydraulic Hose**

Model: **221FR, 451TC, 471TC, 471ST, 772TC, 782TC, 792TC**

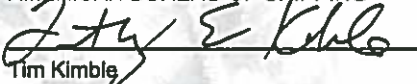
This Product Design Assessment (PDA) Certificate 16-HS1523876-PDA, dated 07/Jun/2016 remains valid until 06/Jun/2021 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

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.

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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


Tim Kimble
Engineer/Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or 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 contained in ABS Rules 1.1 A2/3.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2013).

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Tier: 2 - PDA Issued

Product: Non-metallic Flexible Hydraulic Hose
Model: 221FR, 451TC, 471TC, 471ST, 772TC, 782TC, 792TC
Intended Service:
Marine & Offshore Application - Fuel Oil, Lubricating Oil, Hydraulic Fluid, Water, and Air Systems.

Description:
Inner Tube of Oil Resistant Nitrile or Synthetic Rubber with High Tensile Steel Wire Reinforcement.

Rating:
Model 221FR Size: -5 to -16; MAWP: 500 psi; Burst Pressure: 2000 psi; End Fitting: Parkrimp 26 Sries;

Model 451TC Size: -4 to -20; MAWP: 3000 psi; Burst Pressure: 12000 psi; End Fitting: Parkrimp 43 Series;

Model 471TC/ST Size: -4 (MAWP: 5800 psi; Burst Pressure: 23200 psi), -6 (MAWP: 5000 psi; Burst Pressure: 20000 psi), -8 (MAWP: 4250 psi; Burst Pressure: 17000 psi), -10 (MAWP: 3625 psi; Burst Pressure: 14500 psi), -12 (MAWP: 3125 psi; Burst Pressure: 12500 psi), and -16 (MAWP: 2500 psi; Burst Pressure: 10000 psi); End Fitting: Parker Hannifin 43 Series;

Model 772TC Size: -6 to -16 (MAWP: 4000 psi; Burst Pressure: 16000), -20 (MAWP: 3000 psi; Burst Pressure: 12000 psi), -24 to -32 (MAWP: 2500 psi; Burst Pressure: 10000 psi); End Fitting: Parkrimp 71 Series;

Model 782TC Size: -12 to -24; MAWP: 5000 psi; Burst Pressure: 20000 psi; End Fitting: Parkrimp 78 Series;

Model 792TC Size: -12 to -20; MAWP: 6000 psi; Burst Pressure: 24000 psi; End Fitting: Parkrimp 79 Series;

Applications and Temperature Range:

Model 221FR: Gasoline, ethanol blends, diesel fuels, petroleum-base hydraulic fluids and lubricating oils, -4°F to +212°F (-20°C to +100°C); Water, water/oil emulsion, and water/glycol hydraulic fluids, +185°F (+85°C).

Models 451TC, 471 TC/ST: Petroleum-base hydraulic fluids and lubricating oils, -40°F to +212°F (-40°C to +100°C); Water, water/oil emulsion, and water/glycol hydraulic fluids, +185°F (+85°C); Air -40°F to +158°F (-40°C to +70°C).

Models 772TC, 782TC, 792TC: Petroleum-base hydraulic fluids and lubricating oils, -40°F to +257°F (-40°C to +125°C); Water, water/oil emulsion, and water/glycol hydraulic fluids, +185°F (+85°C); Air, 158°F (+70°C).

See "pdf" attachment Manufacturer's Specifications.

Service Restriction:

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.

- i) Flexible Hose assemblies are not applicable in high pressure fuel oil injection systems.
- ii) The type of end connections utilized (e.g. threaded, flanged, etc.) are to comply with the applicable requirements and limitations of the Steel Vessel Rules 4-6-2/5.7.3 b)
- iii) Flexible hose are not applicable to hoses intended to be used in fixed fire extinguishing systems.
- iv) All Flexible Hose assemblies are to be burst tested to demonstrate they are able to withstand a pressure not less than four times its design pressure in accordance with Steel Vessel Rules 4-6-2/5.7.5 b)
- v) Fittings made of Aluminum are Not to be used on the Hose Assembly.

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Comments:

Duplicate PDA resides with Parker Hannifin Corp. - ALLIANCE, Parker Hannifin Corp. - MANHATTAN, Parker Hannifin-Red Oak, and Parker Hannifin-India

- i) The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.
- ii) The Flexible Hoses are to be complete with factory assembled end fittings or factory supplied ends made of steel only and installed in accordance with manufacturer's procedures in accordance with Steel Vessel Rules 4-6-2/5.7.3 b)
- iii) 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 as indicated in Steel Vessel Rules 4-6-2/5.7.4.
- iv) Flexible Hoses are to be permanently marked by the manufacturer with the following details: Hose manufacturer's name or trademark, date of manufacturer (month/year), designation type reference, nominal diameter, pressure and temperature rating in accordance with Steel Vessel Rules 4-6-2/5.7.6.

Notes/Drawing/Documentation:

PDA Revalidation - Type Approval Form and Request for Duplicated PDAs dated 09 May 2016

Declaration of Conformity dated 11 May 2016

Doc. No. GHS-221FR, Rev. H, Hose Specification - Parker Hose Style 221FR
Burst and Impulse Test Summary, Model 471ST - STR# - W18836 (221FR-5), W22890 (221FR-6), W18838 (221FR-8), W21819 (221FR-10), W18840 (221FR-12), W18841 (221FR-16)

Report No. W19761 221FR-8 (DNV Witness Test), Witness Test Report

Report No. W21305 221FR-6 (DNV Witness Test), Witness Test Report

Report No. W21306 221FR-10 (DNV Witness Test), Witness Test Report

Doc. No. GHS-451TC, Rev. M, Hose Specification - Parker Hose Style 451TC

Burst and Impulse Test Summary, Model 451TC - STR# - W21394 (451TC-4), W22273 (451TC-6), W21277 (451TC-8), W22535 (451TC-10), W21133 (451TC-12), W21123 (451TC-16), W23063 (451TC-20)

Doc. No. GHS-471TC, Rev. F, Hose Specification - Parker Hose Style 471TC

Burst and Impulse Test Summary, Model 471TC/ST - STR# - W21635 & W21982 (471TC/ST-4), W22614 & W20520 (471TC/ST-6), W20523 & W21896 (471TC/ST-8), W21466 & W21968 (471TC/ST-10), W20229 & W21443 (471TC/ST-12), W20430 & W20499 (471TC/ST-16)

Report No. W19765 471TC-10 (DNV Witness Test), Witness Test Report

Report No. W21321 471TC-6 (DNV Witness Test), Witness Test Report

Report No. W21322 471TC-16 (DNV Witness Test), Witness Test Report

Report No. W21416 471ST-4 (DNV Witness Test), Witness Test Report

Report No. W21417 471ST-6 (DNV Witness Test), Witness Test Report

Report No. W21418 471ST-8 (DNV Witness Test), Witness Test Report

Report No. W21419 471ST-10 (DNV Witness Test), Witness Test Report

Report No. W21420 471ST-12 (DNV Witness Test), Witness Test Report

Report No. W21421 471ST-16 (DNV Witness Test), Witness Test Report

Doc. No. GHS-772TC, Rev. B, Hose Specification - Parker Hose Style 772TC

Burst and Impulse Test Summary, Model 772TC - STR# - W21608 (772TC-6), W21307 (772TC-6), W21639 (772TC-8), W21475 (772TC-12), W21308 (772TC-12), W19041 (772TC-16), W21309 (772TC-32)

Report No. W21307 772TC-6 (DNV Witness Test), Witness Test Report

Report No. W21308 772TC-12 (DNV Witness Test), Witness Test Report

Report No. W21309 772TC-32 (DNV Witness Test), Witness Test Report

Doc. No. GHS-782TC, Rev. A, Hose Specification - Parker Hose Style 782TC

Burst and Impulse Test Summary, Model 782TC - STR# - W16395 (782TC-12), W19624 (782TC-16), W21310 (782TC-16), W18260 (782TC-20), W17695 (782TC-24)

Report No. W21310 782TC-16 (DNV Witness Test), Witness Test Report

Doc. No. GHS-792TC, Rev. A, Hose Specification - Parker Hose Style 792TC

Burst and Impulse Test Summary, Model 792TC - STR# - W18436 (782TC-12), W21317 (782TC-16), Report No. W21317 792TC-16 (DNV Witness Test), Witness Test Report

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Doc. No. GHS-471ST, Rev. E, Hose Specification - Parker Hose Style 471ST
Doc. No. Catalog 4400 US, Sheet A-32, Hydraulic Hose 471TC/ST
Burst and Impulse Test Summary, Model 471ST - STR# - W17608 (471ST-4), W15599 (471ST-6), W15601 (471ST-8), W13312 (471ST-10), W20188 (471ST-12), and W15786 (471ST-16)
Report No. 471ST-16 (43) fire test, Fire Test
Report No. 471ST-4 (43) fire test, Fire Test
Report No. 471ST-8 (43) fire test, Fire Test
387TC, 487TC, 471ST, 722TC and 722ST Material Test Data
Report No. W13312 page2, Lab Test Request Results
Report No. W15599 page2, Lab Test Request Results
Report No. W15601 page2, Lab Test Request Results
Report No. W15786 page2, Lab Test Request Results
Report No. W17608 page2, Lab Test Request Results
Report No. W20188 page1, Lab Test Request Results

Terms of Validity:

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STANDARDS

ABS Rules:

The Rules for Conditions of Classification, Part 1 - 2016 Offshore Units and Structures 1-1-4/9.7, 1-1-A2, 1-1-A3, which covers the following:

Mobile Offshore Drilling Units (2016) 4-2-1/11.29;

Facilities on Offshore Installations (2016) A2/Table 1-Marine Support.

The Rules for Conditions of Classification, Part 1 - 2016 Steel Vessels Rules 1-1-4/7.7, 1-1-A3, 1-1-A4, which covers the following:

Steel Vessel (2016) 4-6-2/5.7.

2012, Up-dated December 2015, ABS Guide for the Classification of Drilling Systems 2/7.25, 5/3.7-Support Systems.

National:

SAE J1527:2011 Marine Fuel Hoses - Type A Class I;

SAE J1942:2014 Hose and Hose Assemblies for Marine Applications

SAE J343:2016 Test and Test Procedures for SAE 100R Series Hydraulic Hose and Hose Assemblies

SAE J517:2013 Hydraulic Hose

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International:

ISO 3862:2009 Rubber hoses and hose assemblies - Rubber-covered spiral-wire-reinforced hydraulic types for oil-based or water-based fluids - Specification - Type R12, R15;
EN 856:2015 Rubber hoses and hose assemblies - Rubber-covered spiral-wire-reinforced hydraulic type - Specification - Type R12, R13;
EN 857:2015 Rubber hoses and hose assemblies - wire braid reinforced compact type for hydraulic applications - Specification Type 2SC;
ISO 11237:2010 Rubber hoses and hose assemblies - Compact wire-braid-reinforced hydraulic types for oil-based or water-based fluids - Specification
ISO 6945:1991 Rubber hoses - Determination of abrasion resistance of the outer cover
ISO 7233:2006 Rubber and plastics hoses and hose assemblies - Determination of resistance to vacuum
ISO 7840:2013 Small craft - Fire-resistant fuel hoses
ISO 6605:2002 Hydraulic fluid power - Hoses and hose assemblies - Test methods

Government:

NA

EUMED:

NA

OTHERS:

NA