

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings**with type designation(s)
722TC, 722ST, 787TC, 787ST, 797TC, 797ST

Issued to

**Parker Hannifin Hose Products Division
Wickliffe OH, United States**

is found to comply with

**DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition July 2015
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

Type:	Temperature range:	Max. working press.:	Sizes:
722TC, 722ST	-40°C to 121°C	276, 207 or 172 bar (dependent on size)	3/8" to 2" (DN10 to DN51)
787TC, 787ST	-40°C to 120°C (see application)	350 bar	1/4" to 2" (DN6 to DN51)
797TC, 797ST	-40°C to 120°C (see application)	420 bar	1/4" to 2" (DN6 to DN51)

Issued at **Høvik** on **2017-11-09**for **DNV GL**This Certificate is valid until **2022-11-08**.DNV GL local station: **New York**Approval Engineer: **Sinisa Sedlan**

**Marianne Spæren Marveng
Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Product description

Six types of hose assemblies containing compact high pressure, wire reinforced, rubber covered hoses:

- 722TC and 722ST:
 - Heavy duty, high impulse, four-spiral wire reinforced, rubber covered hydraulic hose According to SAE 100R12.
 - Inner tube: Synthetic rubber.
 - Reinforcement: Four spiral steel wire.
 - Cover:
 - ToughCover (TC): Synthetic rubber abrasion resistant. MSHA accepted.
 - SuperTough Cover (ST): Synthetic rubber super abrasion resistant.
 - Couplings:
 - Parker Coupling Series 43 of carbon steel or 316 stainless steel (-6 through -20).
 - Parker Coupling Series 71 of carbon steel or 316 stainless steel (-24 through -32).
- 787TC and 787ST:
 - According to ISO 18752-AC (sizes -4 to -6) / ISO 18752-DC (sizes -8 to -32).
 - Inner tube: Proprietary synthetic rubber.
 - Reinforcement: Two-braid steel wire for sizes -4 to -6, Four- or six-compact spiral steel wires for sizes - 8 to -32.
 - Cover:
 - ToughCover (TC): Synthetic rubber abrasion resistant. MSHA accepted.
 - SuperTough Cover (ST): Synthetic rubber super abrasion resistant.
 - Couplings:
 - Parker Coupling Series 43/48 of carbon steel or 316 stainless steel (-4 and -6).
 - Parker Coupling Series 77 of carbon steel or 316 stainless steel (-8 through -32).
- 797TC and 797ST:
 - According to ISO 18752-AC (size -4) / ISO 18752-DC (sizes -8 to -20) / ISO 18752-CC (sizes -6, -24, -32).
 - Inner tube: Proprietary synthetic rubber.
 - Reinforcement: Two-braid steel wire for size -4, Four- or six-compact spiral steel wires for sizes - 6 to -32.
 - Cover:
 - ToughCover (TC): Synthetic rubber abrasion resistant. MSHA accepted.
 - SuperTough Cover (ST): Synthetic rubber super abrasion resistant.
 - Couplings:
 - Parker Coupling Series 43/48 of carbon steel or 316 stainless steel (-4 and -6).
 - Parker Coupling Series 77 of carbon steel or 316 stainless steel (-8 through -32).

The rubber hoses are manufactured at the following Parker Hannifin locations:
Manhattan, Kansas; Alliance, Nebraska

The couplings are manufactured at the following Parker Hannifin locations:
Manitowic, Wisconsin; Mason, Michigan; Yangsan, Korea; Chomotov, Czech Republic; Muecke, Germany; Bielefeld, Germany

Application/Limitation

This certificate is valid for the specific assembly of hose and coupling type as specified, assembled and delivered by the holder (named as manufacturer) of this certificate.

Hoses 722TC & 722ST are approved for use with petroleum base fluids and water based hydraulic fluids within a temperature range of -40°C to 121°C (-40°F to 250°F).

Hoses 787TC and 787ST / 797TC and 797ST are approved for hydraulic fluids HH, HL, HM, HR and HV as defined in ISO 6743-4 at temperature ranging from -40°C to +120°C (sizes -4 to -6 rated to +100°C).

DASH	Hose I.D		722TC, 722ST		787TC, 787ST		797TC, 797ST	
			Working pressure		Working pressure		Working pressure	
	Inch	DN	bar	psi	bar	psi	bar	psi
-04	¼	6	N.A.	N.A.	350	5000	420	6000
-06	3/8	10	276	4000	350	5000	420	6000
-08	½	12	276	4000	350	5000	420	6000
-10	5/8	16	276	4000	350	5000	420	6000
-12	¾	19	276	4000	350	5000	420	6000
-16	1	25	276	4000	350	5000	420	6000
-20	1 ¼	31	207	3000	350	5000	420	6000
-24	1 ½	38	172	2500	350	5000	420	6000
-32	2	51	172	2500	350	5000	420	6000

Flexible hoses are only to be used in short lengths where it is necessary due to vibrations or flexible mounting of the machinery. The hoses shall not replace/be used where permanent piping is possible/required.

The hoses must only be fitted in places where they are always accessible.

All hose assemblies delivered under the DNV GL type approval scheme shall be subject to a pressure test at 1.5 times the maximum working pressure and shall be delivered with the pressure test report with reference to the type approval certificate.

This certificate is valid for the specific assembly of hose and coupling type as specified, assembled in:

- Parker Hannifin, 125 E. Meadowiew Road, Greensboro, NC, 27406
- Parker Hannifin, 3737 West River Drive, Davenport, IA, 5280

and delivered by the holder (named as manufacturer) of this certificate.

The hoses are to be mounted in accordance with the manufacturer's instructions.

It must be possible to shut off from the system all flexible hoses used in systems for lube oil, fuel oil and petroleum base hydraulic oil.

Hoses covered by this certificate shall not be used in oil supply lines to burners.

Type Approval documentation

- Manufacturer's catalog: Hose, fittings and equipment, catalog 4400 US June 2017
- Renewal burst test report for Parker Davenport, IA and Parker Greensboro, NC: W24332, dated 2017-06-07
- Documents for 722TC, 722ST:
 - Specification GHS-722ST rev.D dated 27-01-2015
 - Specification GHS-722TC rev.E dated 27-01-2015
 - Burst Test and Change in length test reports: W17914 (722TC-6 & 722ST-6), W17915 (722TC-8 & 722ST-8), W17917 (722TC-10 & 722ST-10), W17918 (722TC-12 & 722ST-12) & W17919 (722TC-16 & 722ST-16) dated 06-Sep-2010 with 43 series fitting witnessed by DNV local station New York
 - Burst Test and Change in length test reports: W21431 (722ST-6) with 43 series fitting dated 2014-10-02, W21432 (722ST-12) with 43 series fitting dated 2014-10-01 & W21433 (722ST-32) with 71 series fitting dated 2014-10-02 witnessed by DNV local station New York

- Burst Test and Change in length test reports: W18236 (722TC-20) with 43 series fitting dated 2010-11-09, W19696 (721TC-24) with 71 series fitting dated 2012-01-11 & W21327 (722TC-32) with 71 series fitting dated 2014-10-01 witnessed by DNV local station New York
- Fire Test reports(done by LAPI):
 - 988.OIS0110/10 dated 02-07-2010 (722TC-6,722ST-6) with 43 series fitting
 - 989.OIS0110/10 dated 02-07-2010 (722TC-10,722ST-10) with 43 series fitting
 - 990.OIS0110/10 dated 02-07-2010 (722TC-16,722ST-16) with 43 series fitting
 - 1596.OIS0110/10 dated 12-11-2010 (722TC-20) with 43 series fitting
 - 1652.OIS0110/14 dated 24-10-2014 (722TC-32) with 71 series fitting
 - 1646.OIS0110/14 dated 24-10-2014 (722ST-6) with 43 series fitting
 - 1647.OIS0110/14 dated 24-10-2014 (722ST-12) with 43 series fitting
 - 1648.OIS0110/14 dated 24-10-2014 (722ST-32) with 71 series fitting
- Cold flexibility, Oil resistance, Cover adhesion, ozone resistance, impulse test and vacuum test reports:
Test specification numbers: 722ST/TC-6, 722ST/TC-8, 722ST/TC-10, 722ST/TC-12, 722ST/TC-16, 722ST/TC-20, 722ST/TC-24, 722ST/TC-32 dated April 2015
- Documents for 787TC, 787ST:
 - Specification GHS-787TC rev.E dated 16-08-2013
 - Burst Test and Change in length test reports: W17813 (787TC-8), W17814 (787TC-10), W17815 (787TC-12), W17816 (787TC-16) & W17817 (787TC-20) dated 06-Sep-2010 with 77 series fitting witnessed by DNV local station New York
 - Burst Test and Change in length test reports: W20442 (787TC-24) & W20443 (787TC-32) dated 2013-09-11 & W21329 (787TC-20) with 77 series fitting witnessed by DNV local station New York
 - Fire Test reports(done by LAPI):
 - 521.OIS0110/10 dated 30-04-2010 (787TC-8) with 77 series fitting
 - 522.OIS0110/10 dated 30-04-2010 (787TC-16) with 77 series fitting
 - 523.OIS0110/10 dated 30-04-2010 (787TC-20) with 77 series fitting
 - 1051.OIS0110/13 dated 25-07-2013 (787TC-24) with 77 series fitting
 - 1052.OIS0110/13 dated 25-07-2013 (787TC-32) with 77 series fitting
 - 1167.OIS0110/17 dated 27-04-2017 (787ST-4) with 43 series fitting
 - 1168.OIS0110/17 dated 27-04-2017 (787ST-4) with 48 series fitting
 - 1169.OIS0110/17 dated 27-04-2017 (787ST-8) with 77 series fitting
 - 1171.OIS0110/17 dated 27-04-2017 (787ST-32) with 77 series fitting
 - 2166.OIS0110/16 dated 12-12-2016 (787TC-4) with 43 series fitting
 - 2167.OIS0110/16 dated 12-12-2016 (787TC-4) with 48 series fitting
 - Cold flexibility, Oil resistance, Cover adhesion, ozone resistance, impulse test and vacuum test reports:
Test specification numbers: 787TC-8, 787TC-10, 787TC-12, 787TC-16, 787TC-20, 787TC-24 & 787TC-32 dated April 2015
 - Engineering Report T-646 dated November 8, 2017: Ozone resistance of 787ST / 797ST; cold bend, cover adhesion, vacuum resistance and impulse test specific to size -04 of 787TC / 787ST and 797TC / 797ST
- Documents for 797TC, 797ST:
 - Specification GHS-797TC rev.E dated 16-08-2013
 - Burst Test and Change in length test reports: W17818 (797TC-8), W17819 (797TC-10), W17820 (797TC-12), W17821 (797TC-16) & W17822 (797TC-20) dated 06-Sep-2010 witnessed by DNV local station New York
 - Burst Test and Change in length test reports: W17822 (797TC-20), W20445 (797TC-24), W20446 (797TC-32) with 77 series fitting with 77 series fitting dated 2013-09-11 witnessed by DNV local station New York
 - Fire Test reports(done by LAPI):
 - 524.OIS0110/10 dated 30-04-2010 (797TC-8) with 77 series fitting
 - 525.OIS0110/10 dated 30-04-2010 (797TC-16) with 77 series fitting
 - 526.OIS0110/10 dated 30-04-2010 (797TC-20) with 77 series fitting

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- 1174.OIS0110/17 dated 27-04-2017 (797ST-8) with 77 series fitting
- 1175.OIS0110/17 dated 27-04-2017 (797ST-16) with 77 series fitting
- 1176.OIS0110/17 dated 27-04-2017 (797ST-32) with 77 series fitting
- 2168.OIS0110/16 dated 12-12-2016 (797TC-4) with 43 series fitting
- 2169.OIS0110/16 dated 12-12-2016 (797TC-4) with 48 series fitting
- Cold flexibility, Oil resistance, Cover adhesion, ozone resistance, impulse test and vacuum test reports:
Test specification numbers: 797TC-8, 797TC-10, 797TC-12, 797TC-16, 797TC-20, 797TC-24 & 797TC-32 dated April 2015
- Engineering Report T-646 dated November 8, 2017: Ozone resistance of 787ST / 797ST; cold bend, cover adhesion, vacuum resistance and impulse test specific to size -04 of 787TC / 787ST and 797TC / 797ST

Tests carried out

Impulse, burst, cold flexibility, oil resistance, ozone, cover adhesion, change in length, dimensional check, fire test.

Marking of product

For traceability to this Type Approval, the products are at least to be marked with:

- Manufacturer's name or trade mark
- Type designation
- Maximum working pressure
- Size

Periodical assessment

For retention of the Type Approval, DNV GL Surveyor shall perform a periodical assessment every second year, to verify that the conditions for the type approval are complied with and to witness burst tests on every 3rd size of each type.

The tests are to be performed with the type of couplings fitted that are Type Approved with the hoses.