

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings**with type designation(s)
701, 731, 771 (721TC), 781 (781TC)

Issued to

PARKER HANNIFIN CONNECTORS LTD.
Gyeongsangnam-do, Republic of Korea

is found to comply with

Det Norske Veritas' Standards for Certification 2.9 No. 5-791.70
Det Norske Veritas' Rules for Classification of Ships Pt.4, Ch.6 "Piping Systems"**Application :****See certificate.**

Type:	Temperature range:	Max. working press.:	Sizes:
701	-40°C to +100°C (dependent on the medium)	280 bar to 415 bar	1/2" to 1"
731	-40°C to +100°C (dependent on the medium)	250 bar to 420 bar	3/4" to 2"
771 (721TC)	-40°C to +125°C	172 bar to 276 bar	3/4" to 2"
781 (781TC)	-40°C to +125°C	345 bar	3/4" & 1"

This Certificate is valid until **2020-06-30**.Issued at **Høvik** on **2015-12-08**DNV GL local station: **Pusan**for **DNV GL**Approval Engineer: **Adel Samiei**

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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

Four types of hose assemblies with Synthetic rubber hoses and four spiral plies of heavy wire wrapped in alternating directions.

Hose assembly types:

- 701 according to EN 856-4SP with Parker couplings series 70
- 731 according to EN 856-4SH with Parker couplings series 73
- 771(721TC) with Parker couplings series 71
- 781(781TC) with Parker couplings series 78

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.

The hose assemblies types 701 & 731 are approved for use with :

- Hydraulic fluids in accordance with ISO 6743-4 with the exception of HFD-R, HFD-S and HFD-T at temperatures ranging from -40°C to +100°C.
- Water base fluids at temperature ranging from -40°C to 70°C.
- Water fluids at temperatures ranging from 0 to +70°C.

The hose assemblies' types 771 & 781 are approved for use with petroleum base fluids and water base fluids within a temperature range of -40°C to +125°C. Operating temperatures in excess of +121°C may materially reduce the life of the hose.

Maximum working pressure of hose assemblies 701 & 731 shall be as follows:

Nominal bore	Hose ID		Maximum working pressure for 701		Maximum working pressure for 731	
	inch	mm	bar	psi	bar	psi
12	½	12.7	415	6000	-	-
19	¾	19.1	350	5000	420	6000
25	1	25.4	280	4000	380	5500
31	1 ¼	31.8	-	-	325	4700
38	1 ½	38.1	-	-	290	4200
51	2	50.8	-	-	250	3600

Maximum working pressure of hose assemblies 771 (721TC) & 781(781TC) shall be as follows:

Nominal bore	Dash size	Hose ID		Maximum working pressure for 771		Maximum working pressure for 781	
		inch	mm	bar	psi	bar	psi
19	-12	¾	19.1	276	4000	345	5000
25	-16	1	25.4	276	4000	345	5000
31	-20	1 ¼	31.8	207	3000	-	-
38	-24	1 ½	38.1	172	2500	-	-
51	-32	2	50.8	172	2500	-	-

Flexible hoses are only to be used 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.

All hoses delivered under the DNV 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.

Flexible hoses of these types are not to be used on boiler fronts.

The hose assemblies covered by this type approval may be assembled and delivered by other than the certificate holder under the following conditions:

Job Id:
Certificate No: **TAP000002M**

- The assembler is authorized by a written authorization from a certificate holder. The certificate holder shall keep record of all assembler authorizations.
- Hose assemblies are in accordance with an assembly procedure issued by the certificate holder and the assembler has proved their qualifications by burst testing of a selection of hose/coupling combinations.
- One sample of each hose type is to be burst tested and the testing is to be witnessed by DNV GL surveyor.

Hose assemblies delivered from an authorized assembler shall in addition to the pressure test report with reference to the type approval certificate be delivered with a copy of the written authorization stamped by DNVGL.

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

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

Type Approval documentation

- Manufacturer's catalogue No. 00-01 4400 KR, issued 01/07
- Parker test reports ref. 1K11, 1K13, 1K08, 2AA2, W4624, 1E11, W46, 1E09
- Reports from burst pressure test witnessed by DNV on 2003-02-09
- Fire test report K-80240, witnessed by DNV on 2008-12-18 (701-8, 771-12, 771-32, 781-16, 731-32)
- Cover adhesion and vacuum test reports dated 2002-02-08
- Oil resistance, ozone resistance & cold flexibility test report dated 2002-02-09
- Burst test report witnessed by DNV local station Pusan dated 2003-02-07
- Dimensional check, change in length & burst test reports witnessed by DNV local station Pusan dated 2007-04-12
- Leakage test, change in length & burst test reports witnessed by DNV local station Pusan dated 2011-06-23
- Burst test report witnessed by DNV local station Pusan dated 2015-06-15

Tests carried out

Burst, Ozone Resistance, Cold Flexibility, Impulse, Dimensional Check, Fire test, Vacuum test, Cover adhesion, Oil resistance, Change in length 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 the following tests on a selection of sizes:

- Dimensional check
- Change in length
- Burst test

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