

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings**with type designation(s)
387TC, 487TC

Issued to

Parker Hannifin Connectors Ltd.
Yangsan-si Gyeongsangnam-do, Republic of Korea

is found to comply with

DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition July 2015**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:
387TC	-40°C to +125°C	210 bar	-4,-6,-8,-10,-12,-16
487TC	-40°C to +125°C	280 bar	-4,-6,-8,-10,-12

This Certificate is valid until **2021-08-28**.Issued at **Høvik** on **2016-08-29**for **DNV GL**DNV GL local station: **Gimhae MC & FIS**Approval Engineer: **Adel Samiei**

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

Two types of hose assemblies :

387TC:

Inner tube: Synthetic Rubber
Reinforcement: One or two braid steel wire
Cover: Synthetic rubber abrasion resistant

487TC:

Inner tube: Synthetic Rubber
Reinforcement: Two braids steel wire
Cover: Synthetic rubber abrasion resistant

Couplings: Parker couplings type 43

Hose and couplings are made by Parker Hannifin Connectors Ltd., Gyeongsangnam-do, Korea

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.

Hose assemblies are approved for use with petroleum base hydraulic fluids within a temperature range of -40°C to +125°C; fresh water & water base hydraulic fluids within a temperature range of -40°C to +85°C, and air up to +70°C.

The cover on hoses for gaseous applications shall be pinpricked.

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 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.

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.

Carbon steel used in couplings shall be normalised when the minimum design temperature is -10°C or below.

Type Approval documentation

- Parker Hannifin catalogue for types 378TC & 487TC
- Parker Hannifin catalogue – 4400 KR for 43 series fittings
- Parker Assembly Instructions (Mounting procedure) – Catalogue 4400 US
- Test reports 14DA5, 14DB2, 14HB2, 14HA2, 14CB9, 14DA2, 14GB3, 14HA6, 14HB1, 14HA1, 14HA4, K15091, K15093, K15095, K15097, K15099, K15101, K15129, K15131, K15133, K15135, K15137
- Oil resistance test report dated 2015-08-24
- Change in Length, Leakage test & Burst test report number K-160454 dated 2016-04-14 witnessed by DNV GL surveyor
- Oil resistance test report dated 2016-08-23
- Fire test report number K-160453 dated 2016-04-14 witnessed by DNV GL surveyor

Tests carried out

Burst test, fire test, pressure impulse test, cover adhesion test, ozone resistance test, change in length test, vacuum test

Job Id: **262.1-020661-1**
Certificate No: **TAP00000FM**

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.