

# TYPE APPROVAL CERTIFICATE

**This is to certify:**

**That the Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings**

with type designation(s)  
**421TC, 421SN**

Issued to  
**Parker Hannifin Manufacturing S.r.l.**  
**Veniano CO, Italy**

is found to comply with  
**DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**  
**DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018**  
**DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses**

**Application :**

**Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.**

<b>Type:</b>	<b>Temperature range:</b>	<b>Max. working press.:</b>	<b>Sizes:</b>
<b>421TC</b>	<b>-40°C to +100°C</b>	<b>See page 2</b>	<b>DN6, 10, 12</b>
<b>421SN</b>	<b>-40°C to +100°C</b>	<b>See page 2</b>	<b>DN6, 10, 12</b>

Issued at **Høvik** on **2020-09-09**

for **DNV GL**

This Certificate is valid until **2025-04-21**.

DNV GL local station: **Italy/Malta CMC**

Approval Engineer: **Andreas Hansen**

**Zeinab Sharifi**  
**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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Job Id: **262.1-029344-2**  
Certificate No: **TAP00001JV**  
Revision No: **1**

## Product description

Synthetic rubber hoses with one braid wire reinforcement designed according to EN 853 1SN.

### Materials:

Inner tube: Nitrile rubber (NBR)

Reinforcement: One braid of steel wire

Cover 421SN: Perforated cover of synthetic rubber

Cover 421TC: MSHA approved synthetic rubber, tough cover

Couplings: Parker Coupling Series 48 (material – stainless steel: 1.4571, 1.4404, 1.4401, carbon steel: 1.0718, 1.0715, SAE1137, 1.0765, 1.0581, 1.0255, 1.0303, 1.0504, 1.7225, 1.7131)

### Manufacturing location for hose and end fittings:

Parker Hannifin Manufacturing S.r.l

6 Via Giovanni Battista Pirelli

Veniano, CO, 22070 Italy

## 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.

Maximum working pressure at room temperature:

Size		421 TC	421 SN
DASH	DN		
4	6	225 bar	225 bar
6	10	180 bar	180 bar
8	12	160 bar	160 bar

Hose assemblies covered by this certificate are approved to be used as flexible connections between bottle valve and manifold in CO<sub>2</sub> fire extinguishing systems.

The cover of the hoses shall be pin-pricked.

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.

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.

The hose assemblies must only be fitted on places where they are always accessible for inspection and shall be mounted according to the manufacturer's instructions.

The outer end of the pipe coupling (performing the connection to the fixed piping) is not covered by this certificate and shall follow the below requirements:

- Flanged ends shall be according to a recognized standard
- Slip-on threaded joints having pipe threads where pressure-tight joints are made on the threads with parallel or tapered threads, shall comply with requirements of a recognized standard. Limitations stated in DNVGL-RU-SHIP Pt.4 Ch.6 Sec.9 [5.6.2] to be followed.
- If these outer ends are going to be part of a mechanical joint as covered by DNVGL-RU-SHIP Pt.4 Ch.6 Sec.9 [Table 10], then they shall be separately type approved.

## Production testing

Each hose assembly shall be hydrostatically tested at a pressure of 1.5 times the maximum working pressure and be delivered with the pressure test report with reference to this type approval certificate.

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## **Type Approval documentation**

- LAPI fire test reports 537/04/AC dated 03/06/2004, 539/04/AC dated 03/06/2004, 536/04/AC dated 03/06/2004.
- Parker Catalogue 4400/UK, 421TC
- Parker Catalogue 4400/UK, 421SN
- Parker Catalogue 4400/UK, Fittings 46/48 Series
- Parker test specification nr. 741 for 421 SN
- Parker test specification nr. 012/17 for 421 TC Perf
- 421TC cover declaration
- Burst test at cold condition
- Pin pricking procedure IL107, rev. 00
- Endurance test with liquid carbon dioxide according to DNVGL-CP-0183
- Renewal burst test report number 3439, 3440, 3441, witnessed by DNV GL, dated 2020-08-16

## **Tests carried out**

Dimensional check, change in length, leakage test, cold flexibility, resistance against liquids, cover adhesion, vacuum test, ozone resistance, fire test, impulse, burst at minimum design temperature, endurance test with liquid carbon dioxide

## **Marking of product**

For traceability to this type approval the products are to be marked with:

- Hose manufacturer's name or trademark;
- Date of manufacture (month/year);
- Designation type reference;
- Nominal diameter;
- Pressure rating;
- Temperature rating.

## **Periodical assessment**

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.