# Amendments to the "Rules for the Type Approval of Flexible Hoses and Expansion Joints"

RFP/049/AMN/02

*Effective from 1/7/2022*

*List of the amendments:*

| Paragraph amended | Reason |
|---|---|
| [4.2.1], [4.2.2], [4.2.3], [4.2.4], [4.3.3] | to introduce **IACS UR P2.12 (Rev 3 - Feb 2021)** "Flexible Hoses" |

## 1 PREMISE

In the Tasneef Rules for the Classification of Ships and in the Tasneef Rules for the Classification of High Speed Craft as well as in the Tasneef Rules for Fire Protection, Detection and Extinction for the Issue of SOLAS Safety Certificates and Rules for Fire Protection, Detection and Extinction for the Issue of Statutory Certificates other than SOLAS Certificates, use is foreseen of flexible hoses and of expansion joints, both in metallic and in non-metallic material, type approved by Tasneef.

The list of type tests to be carried out is indicated in Pt C, Ch 1, Sec 10, [20] of the Rules for the Classification of Ships as well as in the Tasneef Rules for Fire Protection, Detection and Extinction for the Issue of SOLAS Safety Certificates and Rules for Fire Protection, Detection and Extinction for the Issue of Statutory Certificates other than SOLAS Certificates.

## 2 FIELD OF APPLICATION

These Rules apply, for the purpose of type approval, to flexible hoses and expansion joints, both in metallic and non-metallic material, where their use is foreseen by the Tasneef Rules.

For flexible hoses and expansion joints foreseen on board chemical carriers or liquefied gas carriers, see Pt E Ch 8 and 9 of the Rules for the Classification of Ships and the relevant IMO, IBC and IGC Codes.

## 3 DOCUMENTATION

The request for type approval is to be submitted to Tasneef by the Manufacturer, or by the Applicant if authorised by the Manufacturer, and is to include the following:

- details of the Manufacturer
- the designation of the product
- fields of application (with indication of the maximum design pressures, the maximum and minimum design temperatures and of the conveyed media)
- constructional drawings (with indication of the materials employed and details relevant to any weldingor systems of matching fittings and hoses)
- documentation relevant to previous approvals issued by recognised bodies and associated test reports, if any
- prototype test program, for flexible hose assemblies, sufficiently detailed to demonstrate performance in accordance with the specified standards.

## 4 CHECKS AND TESTS

### 4.1 General

The tests are, as applicable, to be carried out on different nominal diameters in accordance with the requirements of the relevant standard indicated in this item [4]. Where non specified at least three samples of each type and dimension of flexible hose complete with end fittings and expansion joints are to be tested; where type approval certification of a number of different diameters of the same type of flexible hoses or expansion joints is required, Tasneef may require type tests on diameters which are representative of the entire range, at Tasneef judgement.

### 4.2 Flexible hoses

#### 4.2.1 General

Prototype tests are to be carried out on flexible hoses complete with end fittings and for each size of hose assembly. However, for ranges with more than 3 different diameters, the prototype tests are to be carried out for at least:

- the smallest diameter
- the largest diameter
- Intermediate diameters selected based on the principle that prototype tests carried out for a hose assembly with a diameter D are considered valid only for the diameters ranging between 0,5 D and 2 D.

For fire resistance tests the specimens shall be selected in accordance with ISO 15540:2016.

#### 4.2.2 Burst pressure tests of metallic and non-metallic flexible hoses

All flexible hoses are to be satisfactorily prototype burst tested to an international standard (see Note 1) to demonstrate they are able to withstand a pressure not less than four times their design pressure without indication of failure or leakage.

For metallic hoses the standard ISO 10380:2012 – Pipework – Corrugated metal hoses and hose assemblies is to be used as applicable.

Note 1: The international standards, e.g. EN or SAE for burst testing of non-metallic hoses, require the pressure to be increased until bursting without any holding period at four times the maximumdesign pressure.

#### 4.2.3 Impulse pressure tests non-metallic flexible hoses

The following standards are to be used as applicable:

- ISO 6802:2018 – Rubber and plastics hoses and hose assemblies with wire reinforcements – Hydraulic impulse test with flexing.
- ISO 6803:2017 - Rubber or plastics hoses and hose assemblies – Hydraulic-pressure impulse test without flexing.

Other standards may be accepted where agreed by Tasneef.

#### 4.2.4 Fire endurance tests of non-metallic hoses

Where flexible hoses are required to be of the fire-resistant type under Pt C, Ch 1, Sec 10 of the Rules for the Classification of Ships, the following standards are to be used as applicable:

- ISO 15540:2016 – Ships and marine technology – Fire resistance of hose assemblies – Test methods.
- ISO 15541:2016 - Ships and marine technology – Fire resistance of hose assemblies -Requirements for test bench.

The proof pressure test is to be carried out at twice the maximum design pressure.

Where flexible hoses are required to be of the fire-

resistant type under the Rules for Fire Protection, Detection and Extinction for the Issue of SOLAS Safety Certificates and under the Rules for Fire Protection, Detection and Extinction for the Issue of Statutory Certificates other than SOLAS Certificates, the following is to be complied with:

- L1 level: a 60 min fire endurance test in dry conditions according to Appendix 1 of IMO Res. A.753(18),
- L3 level: a 30 min fire endurance test in wet conditions according to Appendix 2 of IMO Res. A.753(18).

Other standards may be accepted where agreed by the Society.

#### 4.2.5 Low temperature flexibility test for non-metallic hoses

The samples are to be exposed for at least 24 hours to the minimum design temperature, and in any case to a temperature not higher than -40 °C. Such samples are subsequently to be bent on a mandrel having radius equal to the minimum bending radius of the tested hose foreseen by the Manufacturer, through 90° and 180°. The hose assembly is then to be subjected to a pressure test at twicethe maximum design pressure without any leakage or defect. Subsequently, the outer layer of the hose will be inspected in order to check its integrity.

#### 4.2.6 Vibration tests for metallic and non-metallic hoses

Tasneef reserves the right to require vibration tests to be carried out on samples complete with all the accessories. The test procedures will be agreed on a case-by-case basis taking into account the actual operating conditions of the flexible hoses and expansion joints.

Tasneef may waive such tests where the Manufacturer provides documentation showing the suitability in the foreseen operating conditions of the hoses and expansion joints to be type approved.

#### 4.2.7 Elastic deformation tests of metallic flexible hoses

The samples, complete with all the accessories as in the operating conditions, are to be hydrostatically tested at a pressure twice the maximum design pressure, and no appreciable permanent deformation is to occur.

### 4.3 Expansion joints

#### 4.3.1 Burst pressure tests of non-metallic expansion joints

The samples complete with end fittings are to be tested at ambient temperature at a burst pressure not lower than four times the maximum design pressure, but in any case not lower than 0,5 MPa for maximum design pressure lower than 0,1 MPa and not lower than 1 MPa for maximum design pressure higher than 0,1 MPa. The pressure is to be applied in such a way that the burst pressure is not reached in less than 5 minutes.

#### 4.3.2 Burst pressure tests of metallic expansion joints

The samples, which are not pre-compressed, are to be submitted to a hydrostatic test in order to determine the burst pressure. The pressure is to be applied in such a way that the burst pressure is not reached in less than 5 minutes.

The burst pressure is to be not lower than four times the maximum design pressure.

The hydrostatic tests carried out on a sample may be considered valid, for the same maximum design pressure, for expansion joints having:

- internal diameter at the bottom of convolution pitch and convolution height not greater than the corresponding values of the tested sample;
- thickness not lower than the tested sample;
- the same material as the tested sample.

Tasneef may waive the burst test requirements where, by means of calculations carried out in compliance with recognised standards and supported by tests carried out on other expansion joints, the Manufacturer shows that the burst pressure is not lower than four times the maximum design pressure.

#### 4.3.3 Fire endurance test of non-metallic expansion joints

Where expansion joints are required to be of the fire resistant type under Pt C, Ch 1 Sec 10 of the Rules for the Classification of Ships, the following standards are to be used as applicable:

- ISO 15540:2016 – Ships and marine technology – Fireresistance of hose assemblies – Test methods.
- ISO 15541:2016 - Ships and marine technology – Fire resistance of hose assemblies -Requirements for test bench.

The proof pressure test is to be carried out at twice the maximum design pressure.

Where expansion joints are required to be of the fire-resistant type under the Rules for Fire Protection, Detection and Extinction for the Issue of SOLAS Safety Certificates and under the Rules for Fire Protection, Detection and Extinction for the Issue of Statutory Certificates other than SOLAS Certificates, the following is to be complied with:

- L1 level: a 60 min fire endurance test in dry conditionsaccording to Appendix 1 of IMO Res. A.753(18)
- L3 level: a 30 min fire endurance test in wet conditionsaccording to Appendix 2 of IMO Res. A.753(18).

Other standards may be accepted where agreed by Tasneef.

#### 4.3.4 Elastic deformation tests of metallic expansion joints

The samples, complete with all the accessories as in the operating conditions, are to be hydrostatically tested at a pressure twice the maximum design pressure, and no appreciable permanent deformation is to occur.



**...OMISSIS...**