
**Aircraft — High temperature
convoluted hose assemblies in
polytetrafluoroethylene (PTFE)**

*Aéronefs — Tuyauterie flexible, haute température, convolutive, en
polytétrafluoréthylène (PTFE)*

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Contents

Page

Foreword	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Requirements	1
4.1 Qualification.....	1
4.2 Materials.....	1
4.2.1 General.....	1
4.2.2 Metals.....	2
4.2.3 Non-metallic materials.....	2
4.3 Design.....	2
4.3.1 General.....	2
4.3.2 Inner tube.....	2
4.3.3 Reinforcement.....	2
4.3.4 Interlayers.....	2
4.3.5 Fittings.....	2
4.4 Dimensions.....	2
4.4.1 Hose assembly dimensions.....	2
4.4.2 Length.....	3
4.5 Performance.....	4
4.5.1 General.....	4
4.5.2 Examination of product.....	4
4.5.3 Proof pressure.....	4
4.5.4 Elongation and contraction.....	4
4.5.5 Leakage.....	4
4.5.6 Room temperature burst pressure.....	4
4.5.7 High temperature burst pressure.....	4
4.5.8 Oil resistance.....	4
4.5.9 Fuel resistance.....	4
4.5.10 Flexibility and vacuum.....	4
4.5.11 Pressure impulse.....	4
4.5.12 Conductivity (type 2 only).....	4
4.6 Part numbering of interchangeable parts.....	5
4.7 Product identification.....	5
4.7.1 General.....	5
4.7.2 Fittings.....	5
4.7.3 Assembly.....	5
4.8 Workmanship.....	6
4.8.1 General.....	6
4.8.2 Dimensions and tolerances.....	6
4.8.3 Cleaning.....	6
4.8.4 Openings and covers.....	6
5 Quality assurance provisions	6
5.1 Classification of tests.....	6
5.2 Acceptance tests.....	6
5.2.1 General.....	6
5.2.2 Individual tests.....	6
5.2.3 Sampling test.....	7
5.2.4 Periodic control test.....	7
5.2.5 Rejection and retest.....	7
5.3 Qualification testing.....	7
5.4 Inspection methods.....	9
5.4.1 General.....	9

5.4.2	Examination of product.....	10
5.4.3	Proof pressure test.....	10
5.4.4	Elongation and contraction test.....	10
5.4.5	Leakage test.....	10
5.4.6	Room temperature burst pressure test.....	10
5.4.7	High temperature burst pressure test.....	10
5.4.8	Oil resistance test.....	10
5.4.9	Fuel resistance test.....	11
5.4.10	Flexibility and vacuum test.....	11
5.4.11	Impulse test.....	12
5.4.12	Conductivity test.....	12
5.4.13	Salt corrosion test.....	13
5.5	Test conditions.....	13
5.5.1	Preparation of specimens.....	13
5.5.2	Test fluids.....	13
5.5.3	Temperature measurements.....	13
5.5.4	Test pressure.....	13
6	Ordering data.....	13
	Bibliography.....	14

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 10, *Aerospace fluid systems and components*.

This second edition cancels and replaces the first edition (ISO 7313:1984), which has been technically revised. The main changes compared to the previous edition are as follows:

- [Clause 2](#), normative references, has been updated;
- the structure of the document has been changed.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Aircraft — High temperature convoluted hose assemblies in polytetrafluoroethylene (PTFE)

1 Scope

This document specifies characteristics of hose assemblies with corrosion-resistant metallic braid and convoluted polytetrafluoroethylene (PTFE) inner tube for use in aircraft fluid systems at temperatures between -55 °C and +200 °C and at nominal pressures, depending on bore size, up to 6,8 MPa. Special approval from the proper national authority can be required if these hoses are to be part of a pressurized gas storage system.

Two types of hose assembly are covered in this document:

- Type 1: Non-conductive inner tube; and
- Type 2: Conductive inner tube.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 756-1, *Propan-2-ol for industrial use — Methods of test — Part 1: General*
ISO 7313:2020

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Requirements

4.1 Qualification

The hose assemblies furnished in accordance with this document shall be a product identical to that which has passed the qualification tests herein and shall be suitable for use in aircraft fluid systems under the conditions specified herein.

4.2 Materials

4.2.1 General

The hose assemblies shall be uniform in quality and free from defects in material as is consistent with good manufacturing practice. Materials shall conform to applicable specifications and the requirements specified herein.

4.2.2 Metals

Metals shall be of corrosion-resistant type or be suitably treated to resist corrosion due to fluid being conveyed and/or salt spray and atmospheric conditions to which the hose assembly can be subjected when in storage or during normal service use.

4.2.3 Non-metallic materials

All materials used in the hose assemblies shall be "non-ageing" for storage and shall be compatible with system fluids and other hose assembly materials and suitable for the service intended.

4.3 Design

4.3.1 General

The hose assembly shall consist of a convoluted PTFE inner tube which may be covered with convoluted woven glass cloth and other suitable material. The convoluted PTFE inner tube may also be reinforced with stainless steel wire braid and with end fittings suitable for the intended installation. This document shall specifically cover the hose assembly made up of the specified hose and the hose attachment mechanism of the fitting.

4.3.2 Inner tube

The inner tube shall be of convoluted construction designed to promote easy bending. It shall be free from pitting or projections on the inner surface which can interfere with fluid flow.

4.3.3 Reinforcement

The reinforcement shall consist of a stainless-steel wire braid or braids of sufficient strength and corrosion resistance to meet the requirements of this document.

4.3.4 Interlayers

Interlayers, if used, shall be of suitable material.

4.3.5 Fittings

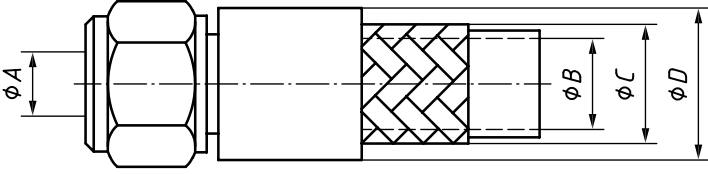
The fittings shall be specifically designed for this hose and materials shall be selected for the specific operating conditions. When the requirements for these fittings and this document conflict, this document shall take precedence.

4.4 Dimensions

4.4.1 Hose assembly dimensions

The dimensions of the hose assemblies shall be in accordance with [Table 1](#).

Table 1 — Hose assembly dimensions



Key

A diameter of the nipple
B inside diameter of the inner tube
C outside diameter of the reinforcement
D outside diameter of the socket

Dimensions in millimetres

DN Hose size	<i>A</i> minimum	<i>B</i> minimum	<i>C</i> maximum	<i>D</i> maximum
06	3,0	4,8	11,3	14,0
10	6,0	8,6	14,3	19,1
12	8,7	12,7	20,0	22,3
16	10,9	14,9	21,9	24,1
20	16,1	19,0	27,8	32,5
25	21,2	23,8	33,4	38,1
32	27,5	30,1	39,7	43,2
40	33,3	36,5	47,7	50,8
50	46,3	49,2	60,4	65,0
63	57,8	61,9	73,1	76,2
80	70,4	74,6	87,3	94,0

4.4.2 Length

Hose assembly lengths shall be specified in the following increments only:

- 500 mm long and under: not less than 5 mm;
- 500 mm to 1 000 mm long: not less than 10 mm;
- 1 000 mm to 1 500 mm long: not less than 20 mm;
- over 1 500 mm long: not less than 30 mm.

Tolerances on hose assembly lengths shall be as follows:

- ± 3 mm for lengths under 500 mm;
- ± 7 mm for lengths from 500 mm to 900 mm;
- ± 13 mm for lengths from 900 mm to 1 300 mm;
- ± 1 % for lengths over 1 300 mm.

4.5 Performance

4.5.1 General

Each hose assembly shall be free from defects of material, workmanship, and finish; shall conform dimensionally to the requirements of this document; shall withstand the proof pressure specified in [Table 2](#) without imperfection or leakage occurring when tested as specified in [5.4.3](#); and shall be capable of performance requirements specified below.

4.5.2 Examination of product

In accordance with [5.4.2](#).

4.5.3 Proof pressure

In accordance with [5.4.3](#).

4.5.4 Elongation and contraction

In accordance with [5.4.4](#).

4.5.5 Leakage

In accordance with [5.4.5](#).

4.5.6 Room temperature burst pressure

In accordance with [5.4.6](#).

4.5.7 High temperature burst pressure

In accordance with [5.4.7](#).

4.5.8 Oil resistance

In accordance with [5.4.8](#).

4.5.9 Fuel resistance

In accordance with [5.4.9](#).

4.5.10 Flexibility and vacuum

In accordance with [5.4.10](#).

4.5.11 Pressure impulse

In accordance with [5.4.11](#).

4.5.12 Conductivity (type 2 only)

In accordance with [5.4.12](#).

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Table 2 — Physical requirements of hose assemblies

DN Hose size	Nominal pressure maximum MPa (bars)	Proof pressure minimum MPa (bars)	Minimum burst pressure at:		Bend radius at inside of bend mm	Test samples ^a	
			room temperature MPa (bars)	high temperature MPa (bars)		Quantity of samples	Length mm
06	6,8 (68)	13,6 (136)	27,2 (272)	19,0 (190)	32	11	460
10	6,8 (68)	13,6 (136)	27,2 (272)	19,0 (190)	57	11	460
12	6,8 (68)	13,6 (136)	27,2 (272)	19,0 (190)	73	11	460
16	6,1 (61)	12,2 (122)	24,4 (244)	17,0 (170)	76	11	460
20	6,1 (61)	12,2 (122)	24,4 (244)	17,0 (170)	95	11	460
25	6,1 (61)	12,2 (122)	24,4 (244)	17,0 (170)	127	11	460
32	6,1 (61)	12,2 (122)	24,4 (244)	17,0 (170)	160	4	460
						7	510 ^b
40	5,1 (51)	10,2 (102)	20,4 (204)	14,2 (142)	190	4	460
						7	635 ^b
50	1,7 (17)	3,4 (34)	6,8 (68)	4,7 (47)	255	4	460
						7	790 ^b
63	0,6 (6)	1,2 (12)	2,4 (24)	1,6 (16)	320	4	460
						7	965 ^b
80	0,6 (6)	1,2 (12)	2,4 (24)	1,6 (16)	380	4	460
						7	1145 ^b

^a For Type 2 testing, one additional sample as noted in 5.4.12 is required.

^b Assembly length required for the impulse test.

4.6 Part numbering of interchangeable parts

All parts having the same manufacturer's part number shall be directly and completely interchangeable with respect to installation and performance.

4.7 Product identification

4.7.1 General

Equipment, assemblies, and parts shall be marked for identification in accordance with appropriate standards to the extent applicable. The special marking specified in 4.7.2 and 4.7.3 shall be added.

4.7.2 Fittings

The manufacturer's name or trademark shall be permanently marked on each end fitting.

4.7.3 Assembly

The assembly shall be identified by a permanent marking on the end fitting or on a permanent band containing the following markings:

- assembly manufacturer's name or trademark;
- complete hose assembly part number;
- nominal pressure in megapascals;