
**Aerospace fluid systems and
components — Vocabulary —**

**Part 1:
Hose assemblies**

*Systèmes aérospatiaux de fluides et éléments constitutifs —
Vocabulaire —*

Partie 1: Assemblages de tuyaux flexibles



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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.

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ISO 8153-1 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 10, *Aerospace fluid systems and components*.

ISO 8153 consists of the following parts, under the general title *Aerospace fluid systems and components — Vocabulary*:

— *Part 1: Hose assemblies*

The following parts are under preparation:

— *Part 2: Fittings*

Aerospace fluid systems and components — Vocabulary —

Part 1: Hose assemblies

Scope

This part of ISO 8153 defines terms used for all types of hose assemblies.

General terms can be made more precise through the addition of supplementary terminology relating to the design, range of application and/or the material of the hose/hose assembly.

Terms and definitions specific to metallic hose assemblies are given in ISO 7369.

NOTE Certain concepts used in this part of ISO 8153 are not applicable to all types of hose assemblies, but only to specific types, e.g. the term “insert” does not apply to a flexible metal hose without an insert as defined by this part of ISO 8153.

1 General terms

1.1

hose assembly

hose, ready for use, equipped with hose fittings at ends

NOTE See Figure 1.

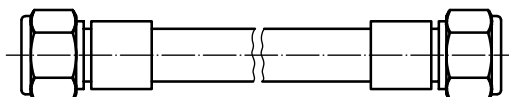


Figure 1 — Hose assembly

1.2

hose line

series of several hose assemblies connected to each other

NOTE See Figure 2.

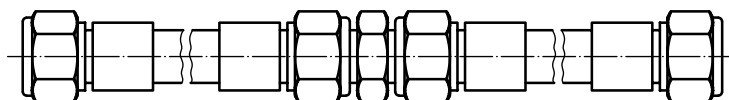


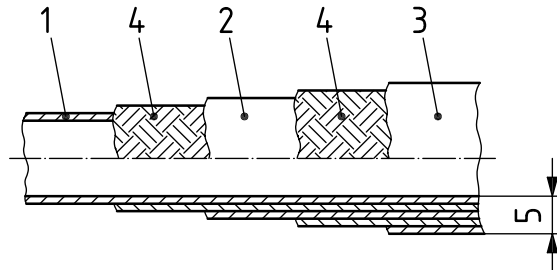
Figure 2 — Hose line

**1.3
hose**

flexible tubular product consisting of an inner tube and generally equipped with a reinforcement, wrap(s) and/or braid(s)

NOTE 1 In US English, the common term for a hose consisting of one layer only is “tubing”.

NOTE 2 See Figure 3.



Key

- 1 inner tube
- 2 intermediate layer
- 3 hose cover
- 4 braid
- 5 hose wall

Figure 3 — Hose

2 Terms related to hose material

**2.1
elastomeric hose**

hose with inner tube made of elastomeric materials

**2.2
polytetrafluoroethylene hose
PTFE hose**

hose with inner tube made of polytetrafluoroethylene (PTFE)

**2.3
plastic hose**

hose with inner tube made of plastic material other than PTFE

**2.4
metal hose**

hose with inner tube made from helical or annular convoluted metallic material

NOTE See ISO 7369.

3 Terms related to hose design

**3.1
braided hose**

hose with reinforcement consisting of one or more braids

3.2**spiral hose**

hose with reinforcement consisting of one or more wraps, each alternate wrap being wound in the opposite direction

3.3**braided and spiral hose**

hose with reinforcement consisting of one or more wraps and braids

3.4**convoluted flexible PTFE hose**

hose with corrugated inner liner fabricated from PTFE tube, or PTFE tape, helically formed to the axis of the hose

NOTE 1 Flexibility is obtained by bending the corrugations.

NOTE 2 See ISO 7313.

4 Terms related to hose application**4.1****sleeve hose****hose for sleeve attachment**

socketless hose of specific length which can be slipped over rigid tube ends

4.2**preformed hose**

hose of which part is permanently set to meet installation requirements

4.3**suction hose**

hose that is usable under positive and relative negative pressure

5 Terms related to hose construction**5.1****hose wall**

composition of the hose between its inner and outer diameter

NOTE See Figure 3.

5.2**layer**

part of the hose wall with a uniform structure

5.2.1**inner tube****layer core**

inner part of the hose which performs the function of containing fluid

NOTE See Figure 3.

5.2.2**intermediate layer**

layer incorporated between the inner tube and the outermost layer of the hose, made of various reinforcement elements

NOTE See Figure 3.

5.2.3
hose cover
outer layer

outermost layer of the hose if it is not covered by reinforcement

NOTE See Figure 3.

5.2.4
outer protective cover

layer forming the outer part of the hose wall

EXAMPLE Outer braids or spirals.

NOTE See **protective sleeve** (9.1).

5.2.5
reinforcement

one or more braids or wraps or helices rendering the hose sufficiently resistant to withstand pressure and/or vacuum

5.2.6
braid

reinforcement texture made from cross-linked yarn or wire

NOTE See Figure 3.

5.2.7
helix

helical wire placed in the hose wall to ensure form stability of the hose in the event of a vacuum or external loads

5.2.8
wrap

reinforcement made up of an assembly of yarns or wires helically wrapped to ensure resistance to pressure

6 Terms related to hose assembly

6.1
hose fitting

component, or subassembly of a hose assembly, whose purpose is to connect hoses to an appropriate fluid circuit

NOTE 1 The terms defined in Clause 6 apply to flexible metal hose assemblies only under certain conditions, in view of the fact that these are generally supplied completely mounted.

NOTE 2 A clear designation includes the following (in the order given):

- hose side configuration;
- connecting end configuration.

The end fitting can be equipped with a bend or an elbow. Some end fittings can be equipped with a swivel nut, which can be designed with or without a thrust wire.

6.2 Configuration of hose side of fitting

NOTE See Figure 4.

6.2.1**separable end fitting**

hose fitting which consists of screwed components and which can be assembled without special tools

6.2.2**swaged fitting****crimped fitting**

fitting consisting mainly of an insert held by a swaged or crimped socket on the hose

NOTE Reuse is not possible – except perhaps for the insert. Special tools are required for assembly.

6.2.3**clamp fitting****segment fitting**

hose fitting consisting mainly of an insert held by externally mounted clamp segments

NOTE It is reusable and can be assembled without special tools.

6.2.4**band clamp fitting**

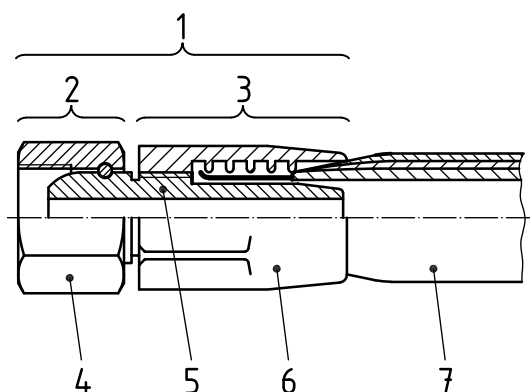
fitting consisting mainly of an insert held by an externally mounted band clamp

NOTE It is reusable and can be assembled without special tools.

6.2.5**socketless fitting**

fitting consisting of an insert without socket or clamp

NOTE The hose is simply slipped over the insert and is held by its elastic deformation.

**Key**

- 1 hose fitting
- 2 connection end
- 3 hose side
- 4 female swivel nut
- 5 insert
- 6 socket
- 7 hose

Figure 4 — Example of hose with toric sealing fitting and swivel nut with thrust wire

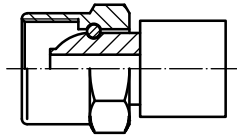
6.3 Configuration of connecting end of fitting

6.3.1 globe seal end female fitting

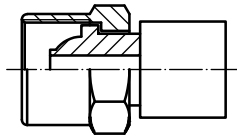
fitting with spherically-shaped, toric or tapered, sealing end and female swivel nut

NOTE 1 See Figure 5.

NOTE 2 Figure 5 a) shows a wired-on swivel nut with thrust wire; Figure 5 b) shows an entrapped swivel nut



a) With a swivel nut with thrust wire



b) With an entrapped swivel nut

Figure 5 — Globe seal end female fitting with a toric fitting and a swivel nut

6.3.2 male thread end

hose fitting with stationary male thread

NOTE See Figure 6.

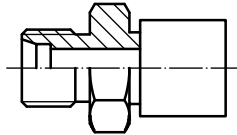


Figure 6 — Male thread end with internal cone

6.3.3 male thread end for port connection

hose fitting with stationary male thread for port holes

NOTE See Figure 7.

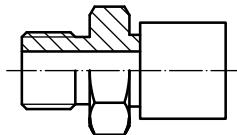


Figure 7 — Male thread end with an external flat sealing for port hole connection

6.3.4**stand pipe end**

hose fitting with tubular end

NOTE See Figure 8.

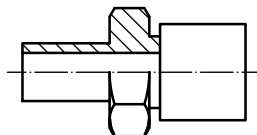


Figure 8 — Stand pipe end

6.3.5**flange end**

hose fitting with fixed or loose flange

NOTE See Figure 9.

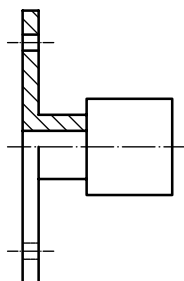


Figure 9 — Flange end with a fixed flange

6.3.6**banjo end**

hose fitting with banjo configuration

NOTE See Figure 10.

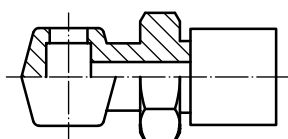


Figure 10 — Banjo end

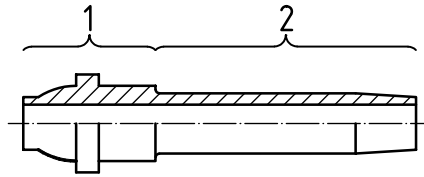
6.4 Fitting component**6.4.1 nipple**

component inserted into the hose and which constitutes the end side connection of the fitting

NOTE A clear designation includes the following (in the order given):

- hose end configuration (see 6.4.1.1 to 6.4.1.3);
- fitting end configuration (see 6.3).

See Figure 11.



Key

- 1 connecting end
- 2 hose end

Figure 11 — Swage insert with globe seal end

6.4.1.1

threaded insert

insert for **separable end fitting** (6.2.1)

6.4.1.2

swage insert

crimp insert

insert for **swaged** or **crimped fitting** (6.2.2)

6.4.1.3

socketless insert

insert for **clamp** or **segment fitting** (6.2.3), **band clamp fitting** (6.2.4) or **socketless fitting** (6.2.5)

6.4.2

socket

component of a fitting which fits over the hose nipple

NOTE See Figure 4.

6.4.2.1

screwed socket

single-piece socket screwed on hose nipple for **separable end fitting** (6.2.1) and **swaged** or **crimped fitting** (6.2.2)

NOTE See Figure 4.

6.4.2.2

outer socket

component of a **swaged** or **crimped fitting** (6.2.2) which embraces the hose and is swaged or crimped to ensure hose sealing

6.4.2.3

segment socket

multi-piece socket for **clamp** or **segment fitting** (6.2.3)

NOTE The socket consists of jaws, clamps and segments.

6.4.2.4

hose clamp

single or multi-piece strip-type component for hose attachment

7 Terms related to hose/hose assembly dimensions

7.1 Linear dimensions

7.1.1

hose assembly length

L_1
straightened length of a hose assembly, measured between gauge planes

NOTE 1 For inclined ends, the hose assembly length is measured between the intersection of the gauge plane and the local centre line. The gauge plane is defined in the appropriate standard for the type of end connection.

NOTE 2 See Figure 12.

7.1.2

free length of hose

L_2
length of the flexible portion of a hose assembly between the end fittings

NOTE See Figure 12.

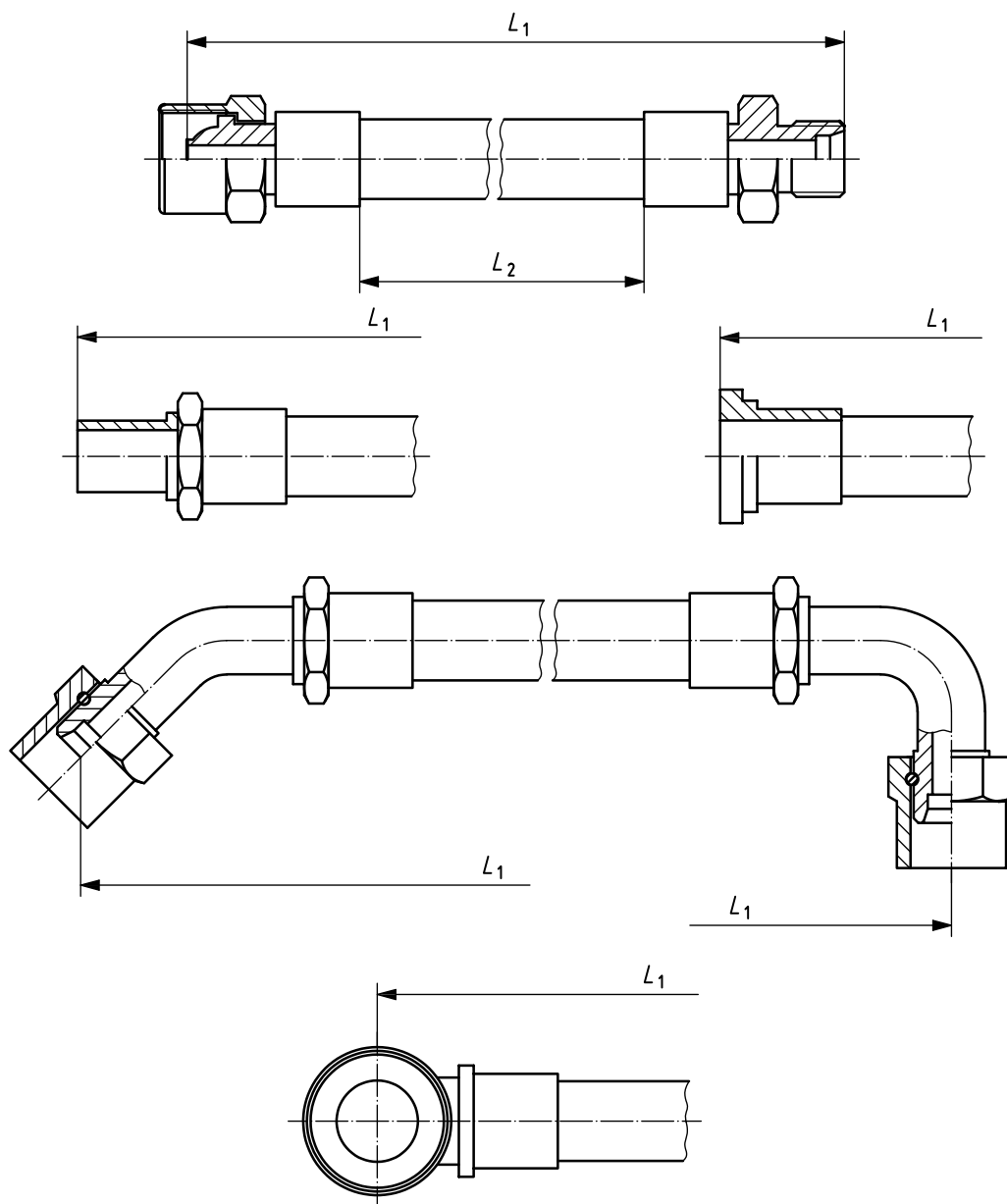


Figure 12 — Hose assembly length and free length of hose

7.2 Angular dimensions

7.2.1

angle of elbow fitting

α

angle indicating the deviation of the axe of the connecting end of the fitting from the axe of the hose

NOTE 1 The angle is determined on the fitting plane by comparison with a straight fitting.

NOTE 2 See Figure 13.

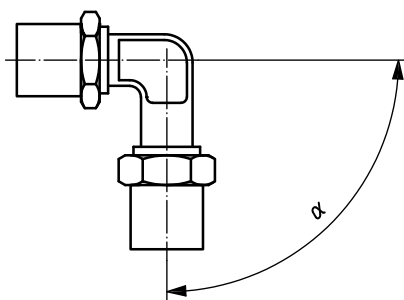


Figure 13 — Angle of elbow fitting

7.2.2

angle of orientation

β

angle indicating the position of the inclined elbow fitting axes in relation to each other

NOTE 1 The angle is determined counter-clockwise, starting from the fitting nearer to the observer.

NOTE 2 See Figure 14.

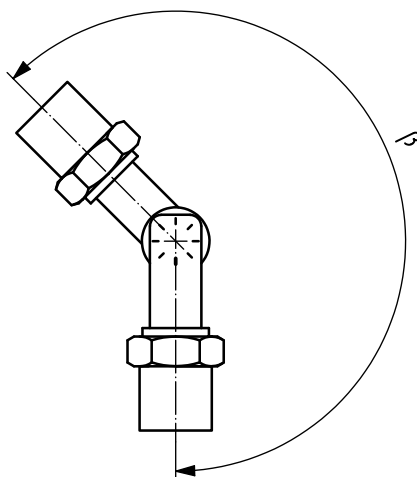


Figure 14 — Angle of orientation

7.2.3
twist

torsion of the hose around its longitudinal axis

NOTE See Figure 15.

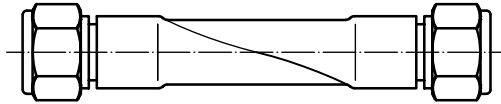


Figure 15 — Twist

7.3 Terms related to radius

7.3.1
bend radius

r
radius of the curve of a hose assembly, measured at the inside curve

7.3.2
minimum bend radius

r_{\min}
minimum bend radius of a hose assembly for use

8 Terms related to hose/hose assembly conductivity

8.1
electric conductivity

ability of hose/hose assembly to conduct electric current

8.2
electric conductor

conductive part of hose

NOTE The electric conductor can be:

- a metallic conductor placed in the hose wall;
- a conductive non-metallic layer.

8.3
antistatic rubber

conductive elastomeric compound

9 Terms related to hose/hose assembly protection

9.1
protective sleeve

additional, fixed or loose protection against any kind of environmental effects, fitted over the hose assembly or parts of it

9.2
anti-chafe sleeve

sleeve fitted over the hose assembly to prevent abrasion

9.3**firesleeve**

sleeve capable of protecting a hose from flames for a defined period of time

10 Terms related to hose/hose assembly defects**10.1****abrasion**

wearing away by friction, especially of hose cover or reinforcement which evidence damage, fraying, etc., due to rubbing or vibrating against another hose or permanent fixture in an installation

10.1.1**minor abrasion**

⟨plait of wires⟩ **abrasion** (10.1) confined to no more than two wires

10.1.2**minor abrasion**

⟨rubber-covered hose⟩ **abrasion** (10.1) confined to the rubber cover of the hose

10.1.3**minor abrasion**

⟨para-aramid reinforced hose⟩ **abrasion** (10.1) in which the straw-coloured reinforcement is not exposed

10.1.4**major abrasion**

⟨plait of wires⟩ **abrasion** (10.1) extending throughout one plait or from one plait to another

10.1.5**major abrasion**

⟨rubber-covered hose⟩ **abrasion** (10.1) in which wire is exposed

10.1.6**major abrasion**

⟨para-aramid reinforced hose⟩ **abrasion** (10.1) in which the straw-coloured reinforcement is exposed

10.2**broken clamps**

loose, broken, or damaged firesleeve clamps which evidence a failure to properly secure firesleeving to a hose assembly

10.3**broken wire**

strand of wire, or multiple strands of wire forming a plait, situated on a hose with a wire-braided jacket or cover, and which is severed or broken in two due to abrasion, flexing or stress fatigue

10.3.1**minor broken wire**

broken wire (10.3) that is an isolated random occurrence

10.3.2**major broken wire**

broken wire (10.3) in which two or more wires in one plait are broken, or breakage of several wires is concentrated in one section

10.4**chalking**

formation of a powdery surface condition due to disintegration of firesleeving or hose cover material by weathering or other destructive environments

10.5

checking

short, shallow cracks on the surface of an elastomeric hose cover material resulting from damaging action of environmental conditions

10.6

corrosion

physical discolouration of hose cover or reinforcement indicative of material degradation

NOTE The degradation can be due, for example, to extreme heat, chemical attack, weathering or oxidation.

10.6.1

minor corrosion

corrosion (10.6) in which there is discolouration of the hose cover or reinforcement, but no physical corrosion is detectable

10.6.2

major corrosion

corrosion (10.6) that is detectable in wire

10.7

cover blisters

raised areas or spots on an elastomeric hose cover surface, usually forming a void or air-filled space in the material

10.8

cracked sleeve

firesleeve that evidences surface cracks or fissures caused by strain and environmental conditions

10.8.1

minor cracked sleeve

cracked sleeve (10.8) in which there is only surface crazing and no excessive hardening

10.8.2

major cracked sleeve

cracked sleeve (10.8) in which the hose is exposed or there is significant hardening

NOTE Significant hardening is the correct cause of apparent over temperature exposure.

10.9

crazing

surface effect on elastomeric hose cover material characterized by multitudinous minute cracks

10.10

heat damage

charring, chalking or hardening and cracking of a hose cover caused by excessive or prolonged exposure to heat

NOTE Other evidence can include fluid leakage from a socket where a fitting or coupling is attached to the hose.

10.11

kinking

temporary or permanent distortion of a hose, induced by winding or doubling upon itself and consequently exceeding the recommended minimum bend radius established for that hose

10.11.1

minor kinking

kinking (10.11) in the body of a low pressure hose

10.11.2**major kinking**

kinking (10.11) near a fitting, or in medium or high pressure hose assemblies

NOTE Kinking near a fitting can indicate possible heavy stress.

10.12**leaker**

crack or hole in the tube, which allows fluids to escape

NOTE A "leaker" can also define a hose assembly which allows fluids to escape at the fittings or couplings.

10.12.1**minor leaker**

leaker (10.12) when the leak can be stopped by tightening a loose swivel nut, or by tightening the swivel nut to maximum recommended torque

10.12.2**major leaker**

leaker (10.12) when there is a tear or defect in the hose assembly or fitting causing a leak, or when there is a leak that cannot be overcome by tightening the swivel nut or retaining bolts (flange) to maximum recommended torque

10.13**loose cover**

separation of the cover from the carcass or reinforcements

10.14**soaked sleeve**

firesleeve saturated to such an extent with fluid conveyed by the hose assembly on which the sleeve is mounted that sweating or permeation of the fluid through the firesleeve results

NOTE A soaked sleeve is usually indicative of a damaged or faulty hose assembly, or spillage of fluid from a nearby port.

10.14.1**minor wetted firesleeve**

firesleeve where wetting is light, intermittent and limited to the external surface only

10.14.2**major wetted firesleeve**

firesleeve where the fibreglass is wetted or the sleeve (integral or slip-on) is submerged

10.15**tear**

sharp break or fissure in the surface of a hose cover, generally caused by strain and service conditions

10.16**torn sleeve**

firesleeve which evidences surface tear, or which has been stretched in two or fissured to such an extent that it will no longer provide adequate fire protection to the hose assembly

10.16.1**minor torn sleeve**

slip-on **torn sleeve** (10.16) with a shallow, superficial tear and no material missing

10.16.2**major torn sleeve**

slip-on **torn sleeve** (10.16) where the fibreglass is exposed

10.17

twist

hose or hose assembly subjected to internal pressures or improperly installed such that each end of the hose is turned awkwardly about the hose axis in opposing directions

10.17.1

minor twist

twist (10.17) that is on all spirally reinforced hose

10.17.2

major twist

twist (10.17) where the wires are broken or the liner cannot be rounded out

10.18

weathering

surface deterioration of a hose cover during outdoor exposure

EXAMPLE Checking; cracking; crazing; chalking.

10.19

wire throw-out

(braided hose) broken end or ends in the wire reinforcements protruding from the surface of the braid

Bibliography

- [1] ISO 7313, *Aircraft — High temperature convoluted hose assemblies in polytetrafluoroethylene (PTFE)*
- [2] ISO 7369, *Pipework — Metal hoses and hose assemblies — Vocabulary*

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