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**Rubber and plastics hoses and hose  
assemblies — Vocabulary**

**Tuyaux et flexibles en caoutchouc et  
en plastique — Vocabulaire**

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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](http://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](http://www.iso.org/patents)).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, *Rubber and plastics hoses and hose assemblies*.

This third edition cancels and replaces the second edition (ISO 8330:2007), which has been technically revised. <https://standards.iteh.ai/catalog/standards/sist/b7bb200f-5840-437c-8f34-54b2fcbdbca9/iso-8330-2014>

In particular, the following have been revised:

- a number of hose terms (see [2.1](#)) have been added and several definitions have been amended (see [2.1](#));
- the following terms have been added:
  - [2.1.8](#) bending (of a hose);
  - [2.1.48](#) flexibility (of a hose);
  - [2.1.50](#) flexural stiffness (of a hose);
  - [2.1.52](#) hardwall hose;
  - [2.1.59](#) hose deformation;
  - [2.1.89](#) nominal size.
- a part of [2.1.7](#) bend radius has been deleted;
- [2.1.30](#) conductivity has been amended;
- Annex A has been deleted and reference is made to Annex A of ISO 8031:2009 instead (see [Clause 1](#) and [2.1.30](#), Note 1).

# Rubber and plastics hoses and hose assemblies — Vocabulary

## 1 Scope

This International Standard defines terms used in the hose industry.

This International Standard is divided into two subclauses, namely

- [2.1](#): hose terms, and
- [2.2](#): hose assembly terms.

NOTE 1 The following hose terms can also be applied to hose assemblies: bend radius, bending, bending force, burst pressure, elongation, hydrostatic stability, hydrostatic stability test, impulse test, kinking, maximum working pressure, minimum bend radius, proof pressure, proof pressure test, reeling diameter, test pressure, vacuum resistance, vacuum stability, vacuum test, working pressure, working temperature.

Recommended terminology and limits for electrical resistance, according to construction, of rubber and plastics hoses and hose assemblies for International Standards and European Committee for Standardization (CEN) standards can be found in ISO 8031:2009, Annex A.

NOTE 2 See also the ISO online browsing platform (OBP): <https://www.iso.org/obp/ui/>

## 2 Terms and definitions

### 2.1 Hose terms

#### 2.1.1

##### **adhesion**

strength of bond between cured rubber surfaces or between a cured rubber surface and a non-rubber surface or the strength of bond between two non-rubber (plastics) hose layers fused or glued together

#### 2.1.2

##### **angle of braid**

##### **angle of lay**

acute angle between any strand of the *braid* ([2.1.17](#)) and a line parallel to the axis of the hose

#### 2.1.3

##### **anti-static wire**

##### **bonding wire**

##### **conducting wire**

metal wire (usually manufactured from thin braided copper wires) incorporated in the *hose wall* ([2.1.60](#)) in order to remove static electricity generated in the hose, and usually connected to the *couplings* ([2.2.10](#)) of an assembly

#### 2.1.4

##### **armoured hose**

*hose* ([2.1.58](#)) with a protective covering, generally applied as a *braid* ([2.1.17](#)) or *helix* ([2.1.54](#)), to minimize physical damage

#### 2.1.5

##### **armouring**

protective covering over a hose, generally applied as a *braid* ([2.1.17](#)) or *helix* ([2.1.54](#)) to prevent mechanical damage or to support the *reinforcement* ([2.1.109](#)) of a hose section

**2.1.6**

**barrier**

thin layer of film (polymeric) within the construction of the hose for preventing fluid or gas from diffusing through the *hose wall* (2.1.60) to the atmosphere

**2.1.7**

**bend radius**

radius of a bent section of hose measured to the innermost surface of the curved portion

**2.1.8**

**bending**

<of a hose> forcing the hose out of a straight line into a curved position

**2.1.9**

**bending force**

load required to induce *bending* (2.1.8) around a specified radius and hence a measure of stiffness

**2.1.10**

**bias angle**

smaller included angle between the *warp* (2.1.145) threads of a cloth and a diagonal line cutting across the warp threads

**2.1.11**

**bias cut**

cut made diagonally across a textile material at an angle less than 90° to the longitudinal axis

**2.1.12**

**bias seam**

seam at which *bias cut* (2.1.11) fabrics are joined together

**2.1.13**

**blister**

hollow space between layers in the *hose wall* (2.1.60), in which air or other gasses are entrapped

[SOURCE: ISO 1382]

**2.1.14**

**body wire**

round or flat wire helix embedded in the *hose wall* (2.1.60) to increase strength or to resist collapse

**2.1.15**

**bonded hose construction**

*hose* (2.1.58) with conductive metallic elements incorporated in the hose construction

Note 1 to entry: When determined in accordance with ISO 8031, the electrical resistance per unit length in the case of hoses (lengths without couplings), or the electrical resistance between the fittings, in the case of hose assemblies, does not exceed  $10^2 \Omega$ .

**2.1.16**

**bore**

inside of a hose through which the material to be conveyed passes

**2.1.17**

**braid**

continuous *sleeve* (2.2.38) of interwoven single or multiple strands of *yarn* (2.1.157) textile or wire

**2.1.18**

**braided hose**

*hose* (2.1.58) in which the reinforcement has been applied as interwoven spiral strands

**2.1.19****brand**

mark or symbol identifying the hose in accordance with the relevant International Standard, the mark or symbol being embossed, inlaid or printed on the hose, *coupling* (2.2.10) or hose assembly

Note 1 to entry: In the relevant International Standard, a colour code may be included at the option of the manufacturer.

**2.1.20****breaker ply**

open mesh *fabric* (2.1.46) used to enhance the bond between a hose *lining* (2.1.78) or cover and its carcass and to spread impact

Note 1 to entry: This element can also add *reinforcement* (2.1.109) to these components.

**2.1.21****burst pressure**

pressure at which rupture of the hose occurs when tested to the relevant International Standard

**2.1.22****capped end**

DEPRECATED: sealed end

hose end covered to protect its internal elements

**2.1.23****carcass**

*fabric* (2.1.46), cord and/or metal reinforcing section of a hose, as distinguished from the hose tube or *cover* (2.1.35)

Note 1 to entry: See *reinforcement* (2.1.109).

**2.1.24****cloth-marked finish**

appearance of the vulcanized cover produced by straight or *spiral wrapping* (2.1.123) used during *vulcanization* (2.1.114) and subsequently removed

Note 1 to entry: See *wrapper marks* (2.1.156).

**2.1.25****coiling diameter**

minimum diameter of coil to which a hose can be coiled without damage

**2.1.26****collapsible hose**

*softwall hose* (2.1.120) which, when unpressurized internally, can be coiled or folded on itself

Note 1 to entry: See layflat hose (2.1.76).

**2.1.27****composite hose****multilayer hose**

*hose* (2.1.58) consisting of layers of non-vulcanized materials in sheeting form held together by two metal or plastics spirals (one inside and one outside)

**2.1.28****compound**

mixture of rubber or plastic and other materials that are combined to give the desired properties when used in the manufacture of a hose

[SOURCE: ISO 1382]

### 2.1.29

#### **conductive hose**

*hose* (2.1.58) incorporating electrically conducting materials in the hose construction, the electrical resistance per unit length in the case of hoses (lengths without couplings), or the resistance between the fittings in the case of hose assemblies, being between  $10^2 \text{ W}$  and  $10^6 \text{ W}$  when determined in accordance with ISO 8031

Note 1 to entry: Recommended terminology and limits for electrical properties are given in ISO 8031:2009, Annex A.

### 2.1.30

#### **conductivity**

property of a hose or hose assembly to conduct electricity

Note 1 to entry: Recommended terminology and limits for electrical properties are given in ISO 8031:2009, Annex A.

Note 2 to entry: Recommended hose classifications are (per length of hose assembly):

- electrically insulating hose:  $> 10^8 \Omega$ ; per assembly
- electrically conductive or anti-static hose:  $< 10^6 \Omega$  (grade  $\Omega$ ); per assembly
- electrically bonded hose:  $< 10^2 \Omega$  (grade M); per assembly
- electrically continuous hose:  $< 10^2 \Omega$ ; per assembly
- electrically discontinuous hose:  $> 2,5 \times 10^4 \Omega$ ; per assembly

Note 3 to entry: A classification for a long hose length without end fittings in ohm per metre ( $\Omega/\text{m}$ ) is still to be established.

### 2.1.31

#### **consolidated**

state in which the components of a hose are firmly brought together by the application of pressure during manufacture

Note 1 to entry: Components cannot be considered bonded until after *vulcanization* (2.1.114). Consolidation procedures may be carried out several times during construction.

### 2.1.32

#### **convoluted hose**

*hose* (2.1.58) fluted helically (externally and/or internally)

### 2.1.33

#### **wire cord**

#### **textile cord**

reinforcement material of thin, flexible metal wires or (usually synthetic) textile *yarns* (2.1.157) which consist of several strands of fine wires or yarns twisted together

### 2.1.34

#### **corrugated hose**

*hose* (2.1.58) with a cover fluted circumferentially with bellows-like corrugations (externally and/or internally)

Note 1 to entry: Hoses are in production today with internal circumferential corrugations.

### 2.1.35

#### **cover**

outer layer covering the *reinforcement* (2.1.109)



**2.1.36****diffusion**

escape of gas from inside the hose through the *carcass* (2.1.23) and *cover* (2.1.35) into the environment

**2.1.37****design pressure**

DEPRECATED: maximum pressure which the hose is designed to withstand, including any momentary surges, during service

Note 1 to entry: The design pressure is sometimes called the rated pressure (2.1.85) and is expressed in SI units (MPa, Pa) or bar (or both).

Note 2 to entry: See *maximum working pressure* (2.1.85).

**2.1.38****dog-leg**

abrupt localized deviation in direction of a hose when pressurized, caused by a local flaw in the construction of the *carcass* (2.1.23) and being manifest as a sharp or angular change in direction

**2.1.39****effusion**

escape of gas from inside the hose through the *lining* (2.1.78) into the *carcass* (2.1.23)

**2.1.40****elongation**

change in length of a *hose* (2.1.58)

Note 1 to entry: It is expressed numerically as a percentage of the initial length.

**2.1.41****embedded helix**

<helical wire or spiral> helical wire entirely enclosed by the *hose wall* (2.1.60)

**2.1.42****end-reinforcement**

extra reinforcing material applied to the end of a hose to provide additional strength or stiffening

**2.1.43****enlarged end****expanded end**

hose end having a diameter greater than the internal diameter of the hose to accommodate a *coupling* (2.2.10) or to fit on to pipework

**2.1.44****embedding layer**

layer of rubber in which is embedded a reinforcing helix of wire or other material

**2.1.45****externally convoluted hose**

*hose* (2.1.58) containing a reinforcing *helix* (2.1.54) in which the outer cover has been formed into corrugations between the turns of the helix

Note 1 to entry: Such hoses may be *rough bore* (2.1.114), semi-embedded bore or smooth bore (2.1.118).

**2.1.46****fabric**

plane structure produced by interlaced *yarns* (2.1.157), fibres or filaments

**2.1.47****filler strip**

material added during fabrication of a hose containing a supporting *helix* (2.1.54) to fill the spaces between the successive turns of the helix

**2.1.48**

**flexibility**

<of a hose> capability of being pliable (without being severely deformed or damaged)

**2.1.49**

**flexible mandrel**

long, round, smooth rod capable of being coiled in a circle of small diameter

Note 1 to entry: It is used for support during the manufacture of certain types of hose. (The mandrel is made of rubber or plastics material and may have a core of flexible wire to prevent stretching.)

**2.1.50**

**flexural stiffness**

<of a hose>measure of the resistance to *bending* (2.1.8)

**2.1.51**

**hand-built hose**

hose made by hand on a *mandrel* (2.1.80), reinforced by textile or wire, or combination of both, and a *cover* (2.1.35)

**2.1.52**

**hardwall hose**

hose with a built-in wall *reinforcement* (2.1.109) or with a solid elastomer wall of sufficient thickness to prevent the hose to flatten during *bending* (2.1.8) or coiling when empty

**2.1.53**

**helical cord**

<in hose> reinforcement formed by a cord or cords wound spirally around the body of a hose

**2.1.54**

**helix**

shape formed by spiralling a wire or other *reinforcement* (2.1.109) around or within the body of the hose

**2.1.55**

**helix angle**

acute angle between any strand of helical *reinforcement* (2.1.109) and a line parallel to the axis

**2.1.56**

**helix wire or spiral**

helical wire

wire spiralled over or under the *reinforcement* (2.1.109) around or within the wall of the hose construction to prevent flattening or *kinking* (2.1.70) during *bending* (2.1.8) of the hose or under vacuum

Note 1 to entry: See *body wire* (2.1.14).

**2.1.57**

**helix-reinforced hose**

*hose* (2.1.58) in which reinforcing *helical wire(s)* [or *spiral(s)*] (2.1.58) are incorporated

**2.1.58**

**hose**

flexible tube consisting of a *lining* (2.1.78), *reinforcement* (2.1.109) and, usually, a *cover* (2.1.35)

**2.1.59**

**hose deformation**

change in hose geometry (generally outside diameter, length, locally positioned bulging, ovality) caused by external causes, as measured according to a specified standard procedure

**2.1.60**

**hose wall**

material between the internal and external surfaces of a hose (2.1.60)

**2.1.61****hydraulic hose**

*hose* (2.1.58) with a *braid* (2.1.17) or spiral *reinforcement* (2.1.109) designed for systems which transfer power via fluid at high pressures

Note 1 to entry: The description “designated to withstand high pressures” can be misleading. For example based on the current definition of hydraulic hose it would be expected that hoses made to ISO 4079, i.e. textile-reinforced hydraulic types, would be for high pressure. However, there are hoses in ISO 4079 with a *maximum working pressure* (2.1.85) of 1,6 MPa (16 bar).

**2.1.62****hydrostatic stability**

ability to resist, within limits, changes in length and/or diameter and/or *twist* (2.1.138) at a specified pressure

**2.1.63****hydrostatic stability test**

non-destructive test in which the change in length and/or diameter and/or *twist* (2.1.138) of a hose is measured at a specified pressure

**2.1.64****impulse**

pressure of short duration that may be cyclic, and which produces sudden stress

**2.1.65****impulse test**

pulsating pressure test, usually applied to *hydraulic hoses* (2.1.61)

**2.1.66****insulating layer**

material (i.e. rubber) between plies of *reinforcement* (2.1.109)

**2.1.67****inside diameter****ID**

diameter of the *bore* (2.1.16) of a hose

Note 1 to entry: It is expressed in millimetres.

**2.1.68****jacket**

seamless tubular braided or woven ply generally on the outside of a hose

**2.1.69****kink**

permanent or temporary deformation of a section of the hose *bore* (2.1.16)

**2.1.70****kinking**

permanent or temporary distortion of a hose by excessive *bending* (2.1.8), leading to closure or partial closure of the hose bore and/or permanent deformation

**2.1.71****knitted hose**

hose with textile *reinforcement* (2.1.109) applied in an inter-locking looped configuration

**2.1.72****knitted ply**

layer of textile *reinforcement* (2.1.109) in which the *yarns* (2.1.157) are applied in an interlocking looped configuration in a continuous tubular structure

**2.1.73**

**lap**

part that extends over itself or over a similar part, usually by a desired and predetermined amount

**2.1.74**

**lap seam**

seam made by placing the edge of one piece of material so that it extends flat over the edge of a second piece of material

**2.1.75**

**lay**

direction of advance of a strand of reinforcing material for one complete turn along its length axis

**2.1.76**

**layflat hose**

*softwall hose* (2.1.120) which, when unpressurized internally, collapses to such an extent that the inner faces of the *bore* (2.1.16) make contact and the hose cross-section appears flat

**2.1.77**

**linear (electrical) resistance**

electrical resistance of a hose, measured in accordance with ISO 8031

Note 1 to entry: It is expressed in ohms per metre ( $\Omega/m$ ).

**2.1.78**

**lining**

innermost continuous all-rubber or plastics element of a hose

**2.1.79**

**machine-made hose**

*hose* (2.1.58) made by machine (instead of by hand on a mandrel), particularly *wrapped-ply hose* (2.1.155)

**2.1.80**

**mandrel**

rigid or flexible rod or tube of circular cross-section on which certain types of hose are manufactured

**2.1.81**

**mandrel-built**

fabricated on a *mandrel* (2.1.80)

**2.1.82**

**mandrel-made hose**

*hose* (2.1.60) fabricated by hand and vulcanized on a *mandrel* (2.1.80)

**2.1.83**

**marker yarn**

identification *yarn* (2.1.157) which is placed in the hose during manufacture to identify the manufacturer

**2.1.84**

**marking**

hose identification details

**2.1.85**

**maximum working pressure  
rated pressure**

maximum pressure which the hose is designed to withstand, including any momentary surges, during service

Note 1 to entry: It is necessary to make a distinction between frequent predictable surges and unpredictable surges, which happen infrequently only.

**2.1.86****minimum bend radius**

smallest specified radius to which a hose may be bent in service

Note 1 to entry: See *bend radius* (2.1.7).

**2.1.87****moulded hose**

*hose* (2.1.58) vulcanized in a rigid mould or inside a lead sheath that is subsequently removed

**2.1.88****nominal bore**

reference number for the *bore* (2.1.16) of a hose

Note 1 to entry: It is dimensionless.

**2.1.89****nominal size****nominal bore size**

size given to a hose for the purpose of identification

Note 1 to entry: It is dimensionless.

Note 2 to entry: See *nominal bore* (2.1.88).

**2.1.90****non-conductive hose****insulated hose**

*hose* (2.1.58) made of non-conductive material

Note 1 to entry: It does not incorporate conductive elements and is not capable of dissipating electrostatic charges.

**2.1.91****operating conditions**

pressure, temperature, motion and environment to which a hose (assembly) may be subjected

**2.1.92****OSD hose****oil suction and discharge hose**

hose used for oil suction and discharge in many types of operation

**2.1.93****outside diameter****OD**

diameter of the exterior of the cross-section of a hose

Note 1 to entry: It is expressed in millimetres.

**2.1.94****permeation**

process of penetration and *effusion* (2.1.39) or diffusion of a gas or liquid through the *hose wall* (2.1.60)

**2.1.95****pitch**

distance between two consecutive turns of a helix measured parallel to the axis

Note 1 to entry: This term may also apply to other reinforcing components.

**2.1.96****plain end**

uncapped or otherwise unprotected end of a hose

**2.1.97**

**plastics hose**

hose of plastics material with a *reinforcement* (2.1.109) of textile material or metal wire and a cover of plastics material

**2.1.98**

**plastics-lined hose**

hose with a *lining* (2.1.78) of plastics material

**2.1.99**

**ply** (pl. plies)

layer of reinforcing material

Note 1 to entry: See *reinforcement* (2.1.109).

**2.1.100**

**ply adhesion**

force required to separate two adjoining plies of a hose

**2.1.101**

**popcorning**

effect on a steam hose *lining* (2.1.78) attributed to the eruption, during subsequent use, of condensate formed and entrapped in the lining during cooling

**2.1.102**

**pre-shaped hose**

**pre-formed hose**

hose vulcanized or formed into a particular shape

**2.1.103**

**pricking**

perforation of a hose cover designed to prevent *blisters* (2.1.13) on the cover formed by the expansion of gases trapped in the interstices of the *reinforcement* (2.1.109)

**2.1.104**

**proof pressure**

pressure applied during a non-destructive test and held for a specified period of time to prove the integrity of the construction

Note 1 to entry: It is expressed in SI units (MPa, Pa) or in bar (or both).

**2.1.105**

**proof pressure test**

pressure holding test to prove the structural integrity of a hose

**2.1.106**

**protected hose**

*hose* (2.1.58) with external protection, generally braiding or a spiral, to prevent external damage

**2.1.107**

**rated system pressure**

pressure serving as a basis for calculating the rated pressure (2.1.85) of a complete piping system

**2.1.108**

**reeling diameter**

minimum diameter of reel on which a *hose* (2.1.58) can be coiled without damage by *kinking* (2.1.70) or distortion

Note 1 to entry: See *collapsible hose* (2.1.26).

**2.1.109****reinforcement**

non-rubber strengthening member of a hose

Note 1 to entry: See *carcass* (2.1.23).

**2.1.110****reinforced end**

hose end equipped with extra *reinforcement* (2.1.109) to achieve additional strength or stiffness

**2.1.111****reinforcement angle**

angle formed by the intersection of a *reinforcement* (2.1.109) strand and a line parallel to the axis of the *hose* (2.1.58)

**2.1.112****reinforcing rings**

steel (usually) or plastics rings, embedded over the reinforcement layers of some hose designs, which have the same function as a helical or *body wire* (2.1.14)

**2.1.113****round-woven hose**

*hose* (2.1.58) with a round-woven *reinforcement* (2.1.109)

EXAMPLE fire fighting hose, rig supply hose, etc.

**2.1.114****rough bore hose**

*hose* (2.1.58) in which a reinforcing helix of wire, or its shape, is exposed in the *bore* (2.1.16)

**2.1.115****rubber hose**

tube made of vulcanized rubber with a *reinforcement* (2.1.109), generally textile or metal wire, and usually a cover

**2.1.116****rubber tubing**

flexible tube made of vulcanized rubber without a *reinforcement* (2.1.109)

**2.1.117****semi-embedded helix or spiral**

helical wire, concentric with the *bore* (2.1.16), semi-embedded in the *lining* (2.1.78) of a *hose* (2.1.58) so that only a portion of the wire is exposed

**2.1.118****smooth-bore hose**

*hose* (2.1.58) in which no reinforcing wire helix or its shape is exposed on the inner surface of the *lining* (2.1.78)

**2.1.119****soft end**

hose end in which the rigid *reinforcement* (2.1.109) of the body, usually wire, is omitted

**2.1.120****softwall hose**

*hose* (2.1.58) without a supporting helix of rigid or semi-rigid material