

INTERNATIONAL  
STANDARD

**ISO**  
**6224**

Second edition  
1995-08-01

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**Plastics hoses, textile-reinforced, for  
general-purpose water applications —  
Specification**

**iTeh STANDARD PREVIEW**

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*Tuyaux en plastique à armature textile d'usage général pour l'eau —  
Spécifications*

ISO 6224:1995

<https://standards.iteh.ai/catalog/standards/sist/76429781-a2c3-4123-aeb6-fd116523fc72/iso-6224-1995>



Reference number  
ISO 6224:1995(E)

## 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 6224 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, *Hoses (rubber and plastics)*.

This second edition cancels and replaces the first edition (ISO 6224:1981), which has been technically revised.

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International Organization for Standardization  
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

# Plastics hoses, textile-reinforced, for general-purpose water applications — Specification

## 1 Scope

This International Standard specifies the requirements for three types of non-collapsible, textile-reinforced thermoplastic discharge water hose up to a maximum working pressure of 2,5 MPa at 23 °C for application in a range of temperatures from – 10 °C up to + 60 °C.

NOTE 1 At a temperature above 23 °C, and particularly above 40 °C, maximum working pressure will be reduced.

The standard does not include hoses for some special fields of application where specific international standards exist or are under preparation, e.g.

- conveyance of drinking water;
- washing-machine inlets;
- fire-fighting hoses;
- special agricultural machines;
- gardening hoses for the consumer market.

NOTE 2 The hoses may be used with additives which lower the freezing point of water down to – 10 °C.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most re-

cent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3:1973, *Preferred numbers — Series of preferred numbers*.

ISO 37:1994, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*.

ISO 176:1976, *Plastics — Determination of loss of plasticizers — Activated carbon method*.

ISO 188:1982, *Rubber, vulcanized — Accelerated ageing or heat-resistance tests*.

ISO 1307:1992, *Rubber and plastics hoses for general-purpose industrial applications — Bore diameters and tolerances, and tolerances on length*.

ISO 1402:1994, *Rubber and plastics hoses and hose assemblies — Hydrostatic testing*.

ISO 1746:1983, *Rubber or plastics hoses and tubing — Bending tests*.

ISO 4672:—<sup>1)</sup>, *Rubber and plastics hoses — Subambient-temperature flexibility tests*.

ISO 7751:1991, *Rubber and plastics hoses and hose assemblies — Ratios of proof and burst pressure to design working pressure*.

ISO 8033:1991, *Rubber and plastics hose — Determination of adhesion between components*.

ISO 11758:1995, *Rubber and plastics hoses — Exposure to a xenon arc lamp — Determination of changes in colour and appearance*.

1) To be published. (Revision of ISO 4672:1988)

### 3 Types of hose

Three types of hose are specified, as follows:

Type 1: Light service, with a maximum working pressure of 0,6 MPa at 23 °C;

Type 2: General service, with a maximum working pressure of 1,0 MPa at 23 °C;

Type 3: Heavy service, with a maximum working pressure of 2,5 MPa at 23 °C.

The ratios of proof pressure and minimum burst pressure to design working pressure are 1,5 and 3 respectively for types 1 and 2, and 2 and 4 respectively for type 3, in accordance with ISO 7751.

### 4 Construction and materials

Hoses shall be as uniform as is commercially practicable in colour, opacity and other physical properties, and shall consist of

- a flexible lining of thermoplastic;
- a flexible layer, or layers, of natural or synthetic textile, applied by any suitable technique;
- a flexible thermoplastic cover which may have a smooth or fluted finish.

The colour of the cover may be different from that of the lining.

The cover and lining shall be fully gelled and free from visible cracks, porosity, foreign inclusions and any other defects which would cause the hose to be un-serviceable.

## 5 Dimensions

### 5.1 Bore size and wall thickness

Nominal bore sizes, tolerances and minimum wall thicknesses shall be as specified in table 1.

### 5.2 Cut lengths

The tolerances on cut lengths of hose shall be as specified in table 2.

## 6 Physical properties of lining and cover

### 6.1 Tensile strength and elongation at break

When determined in accordance with ISO 37, the tensile strength and elongation at break of the lining and cover shall not be less than the values given in table 3.

### 6.2 Accelerated ageing

After ageing as specified in ISO 188 for 3 days at a temperature of 70 °C ± 1 °C, the tensile strength and elongation at break of the lining and cover, as determined by ISO 37, shall not vary from the initial values by more than the values given in table 4.

**Table 1 — Nominal bore diameters, tolerances and minimum wall thicknesses**

Dimensions in millimetres

Nominal bore diameter	Tolerance	Minimum wall thickness		
		Type 1	Type 2	Type 3
10	±0,75	2,00	2,00	2,80
12,5	±0,75	2,00	2,50	3,00
16	±0,75	2,00	2,80	3,00
19	±0,75	2,20	3,00	3,50
25	±1,25	2,70	3,50	4,00
31,5	±1,25	3,40	4,00	—
38	±1,50	4,00	4,50	—
50	±1,50	5,00	5,50	—

NOTE For smaller or larger dimensions, further numbers shall be chosen from the R 10 series of preferred numbers (see ISO 3), with tolerances as specified in ISO 1307.

For intermediate dimensions, numbers shall be chosen from the R 20 series of preferred numbers (see ISO 3), with the tolerances as given for the next-larger size.

**Table 2 — Tolerances on length**

Length	Tolerance
Up to 300 mm	±3 mm
300 mm to 600 mm	±4,5 mm
600 mm to 900 mm	±6 mm
900 mm to 1 200 mm	±9 mm
1 200 mm to 1 800 mm	±12 mm
Over 1 800 mm	±1 %

**Table 3 — Minimum values of tensile strength and elongation at break**

Hose component	Tensile strength MPa	Elongation at break %
Lining	10	250
Cover	10	250

**Table 4 — Maximum variation in tensile strength and elongation at break after ageing**

Hose component	Tensile strength	Elongation at break
Lining	15 %	25 %
Cover	15 %	25 %

**Table 5 — Hydrostatic-pressure requirements at 23 °C**

Hose type	Maximum working pressure MPa	Proof pressure MPa	Minimum burst pressure MPa	Maximum change in dimensions at proof pressure	
				length	diameter
1	0,6	0,9	1,8	±8 %	±10 %
2	1,0	1,5	3,0	±8 %	±10 %
3	2,5	5,0	10,0	±8 %	±10 %

### 6.3 Loss in mass on heating

When tested in accordance with method B of ISO 176:1976, the materials of the lining and cover shall not show a loss in mass greater than 4 %.

## 7 Performance requirements for finished hose

### 7.1 Hydrostatic-pressure requirements

When tested in accordance with ISO 1402, the hose shall meet the requirements of tables 5 and 6.

During and after the proof-pressure hold test, the hose shall be examined for evidence of leakage, cracking, abrupt distortion indicating irregularity in materials or manufacture and any other signs of failure. No such defects shall be observed.

### 7.2 Adhesion

When determined in accordance with ISO 8033, the adhesion between lining and cover shall not be less than 1,5 kN/m for all three types.

### 7.3 UV resistance (xenon arc lamp)

When tested in accordance with ISO 11758, the cover shall show no evidence of cracking or change of colour. After testing, when comparing the test pieces with the grey scale, the minimum acceptable contrast shall be grade 4.

**Table 6 — Hydrostatic-pressure requirements at 60 °C**

Hose type	Maximum working pressure MPa	Minimum burst pressure MPa
1	0,36	1,1
2	0,65	1,95
3	1,25	5,0

**7.4 Flexibility at 23 °C**

When determined in accordance with method A of ISO 1746:1983, using a minimum diameter of curvature  $C$  of 10 times the nominal bore size (see table 1), the ratio  $T/D$  of the external diameter  $T$  of the hose, when bent, to the external diameter  $D$  of the unbent hose shall not be less than 0,8.

**7.5 Low-temperature flexibility at  $-10\text{ °C} \pm 2\text{ °C}$** 

When tested in accordance with method B of ISO 4672, the hose shall be capable of being bent

around a mandrel with a radius of twice the bend radius specified in 7.4 at a temperature of  $-10\text{ °C} \pm 2\text{ °C}$ .

No cracks shall be detected and the hose shall pass the proof pressure test as defined in table 5 (i.e. at 23 °C).

**8 Marking**

The hose shall be continuously and durably marked with the following information:

- the number of this International Standard, i.e. ISO 6224;
- the manufacturer's name or identification;
- the manufacturer's product identification (optional);
- the hose type;
- the nominal bore;
- the quarter (using 1Q, 2Q, 3Q or 4Q) and year (using four digits) of manufacture.

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**ICS 23.040.70**

**Descriptors:** plastics products, thermoplastic resins, reinforced plastics, hoses, water pipes, plastics hoses, classification, specifications, performance, dimensions, dimensional tolerances, marking.

Price based on 4 pages

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