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Rubber and/or plastics hoses and hose assemblies for airless paint spraying — Specification

Tuyaux et flexibles en caoutchouc et/ou en plastique pour pulvérisation (AIRLESS) des peintures — Spécifications

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Foreword

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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 document 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).

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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 45, *Rubber and rubber products, Subcommittee SC 1, Rubber and plastics hoses and hose assemblies*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 218, *Rubber and plastics hoses and hose assemblies,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 8028:2017), which has been technically revised.

The main changes are as follows:

— subclause 8.1 and Table A.2 (merged with Table A.1) have been re-written to clarify the conditions for the number of test samples;

— subclause 8.2 has been re-written to make appropriate minimum bend radius and to confirm the Electrical-continuity requirements after the impulse test;

— subclause 8.3 has been re-written to cite appropriate subclauses in ISO 8031;

— in Clause 12, year of publication has been deleted, and the unit of working pressure to MPa as a main unit has been changed;

— Annex B has been deleted;

— the Normative references have been updated.

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.

Rubber and/or plastics hoses and hose assemblies for airless paint spraying — Specification

WARNING — Persons using this document should be familiar with normal laboratory practice. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices.

1 Scope

This document specifies the requirements for four types of hose and hose assemblies for use in airless paint spraying. The four types are differentiated by burst pressure and operating temperature, and can be constructed from rubber or plastic materials, or a combination of rubber and plastic material.

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 1402, *Rubber and plastics hoses and hose assemblies — Hydrostatic testing*

ISO 1817:2024, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

ISO 6803, *Rubber or plastics hoses and hose assemblies — Hydraulic-pressure impulse test without flexing*

ISO 7326:2016, *Rubber and plastics hoses — Assessment of ozone resistance under static conditions*

ISO 8031:2020, *Rubber and plastics hoses and hose assemblies — Determination of electrical resistance and conductivity*

ISO 8033, *Rubber and plastics hoses — Determination of adhesion between components*

ISO 8330, *Rubber and plastics hoses and hose assemblies — Vocabulary*

ISO 30013:2011, *Rubber and plastics hoses — Methods of exposure to laboratory light sources — Determination of changes in colour, appearance and other physical properties*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8330 apply.

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 https://www.electropedia.org/

4 Types of hose and hose assemblies

Four types of hose and hose assemblies are specified, as follows:

— Type A: Assemblies designed for a maximum working pressure of 20 MPa (200 bar), intended for spraying paints containing solvents at temperatures from –20 °C to +50 °C;

— Type B: Assemblies designed for a maximum working pressure of 36 MPa (360 bar), intended for spraying paints containing solvents at temperatures from –20 °C to +50 °C;

— Type C: Assemblies designed for a maximum working pressure of 20 MPa (200 bar), intended for spraying paints containing solvents at temperatures from –20 °C to +80 °C;

— Type D: Assemblies designed for a maximum working pressure of 36 MPa (360 bar), intended for spraying paints containing solvents at temperatures from –20 °C to +80 °C.

5 Construction and materials

The hose for use in assemblies shall consist of a smooth seamless lining of rubber or plastics material, a reinforcement of either wire or textile and a cover of rubber or plastics material. A hose with a plastic tube and a rubber cover can also be used.

The hose construction shall contain an electrically conductive element (which can have a conductive lining or cover or bonding wires) capable of being connected to the end fittings to ensure compliance with the electrical requirements as specified in 8.3 throughout the expected life of the hose assembly. The hoses shall be marked either Ω (when conductive compounds are used) or M when bonding wires are used.

The hose assembly shall have permanent couplings. The couplings shall be electrically conducting and connected to the conductive element constructed in the hose. Only couplings that have been used on assemblies that have successfully met the requirements of 8.1, 8.2 and 8.3 shall be used.

6 Dimensions and tolerances

The inside diameters and tolerances shall be in accordance with the values given in Table 1.

Table 1 — Diameters and tolerances

Dimensions in millimetres

Inside diameter	Tolerance
3,2 4 5	±0,5
6,3 8 9,5 12,5	±0,75

7 Performance requirements for finished hose

7.1 Adhesion requirements

The test shall be carried out in accordance with ISO 8033. The adhesion between the lining and inner lamination and the cover and the outer lamination shall be not less than 0,8 kN/m for hoses with an inner diameter of ≤20 mm, and 0,9 kN/m for hoses with an inner diameter of >20 mm.

With hoses that use a plastic lining, the adhesion should be measured between the plastic lining and the rubber tie gum and the reinforcement. The rubber layer shall adhere continuously to the plastics lining and should have a value not less than 0,8 kN/m to the reinforcement.

Three samples of hose should be tested per production run.

7.2 Ultraviolet resistance (plastics cover only)

The test shall be carried out in accordance with ISO 30013:2011, Method 1. The test piece shall show no signs of cracking.

7.3 Resistance to ozone (rubber cover only)

The test shall be carried out in accordance with ISO 7326:2016, Method 1. The test piece shall show no signs of cracking.

8 Performance requirements for finished hose and hose assemblies

8.1 Hydrostatic requirements

The test shall be carried out in accordance with ISO 1402 at the relevant proof pressure and the relevant minimum burst pressure given in Table 2. The hoses and hose assemblies shall not fail.

Table 2 — Hydrostatic-pressure requirements

Hose type	Working pressure MPa (bar)	Proof pressure MPa (bar)	Minimum burst pressure MPa (bar)
A	20 (200)	40 (400)	80 (800)
B	36 (360)	72 (720)	144 (1 440)
C	20 (200)	40 (400)	80 (800)
D	36 (360)	72 (720)	144 (1 440)

8.2 Impulse test requirements

Four assemblies shall be tested in accordance with ISO 6803 by mounting the test piece with minimum bend radius specified by the manufacturer. The pulse pressure used shall be 125 % of the working pressure. The test temperature shall be 50 °C for types A and B, and 80 °C for types C and D. Each test assembly shall withstand 150 000 pulses without leaking, cracking, abrupt distortion or other signs of failure. At the end of 150 000 pulses, the hose assembly shall meet the requirements of 8.3.

8.3 Electrical-continuity requirements

The test for electrical continuity shall be carried out in accordance with ISO 8031, and every hose assembly shall have a maximum resistance of 3×10^4 Ω/m.

The methods listed in ISO 8031:2020, 4.5 and 4.6 shall be used when electrical continuity is achieved by means of bonding wires.

9 Physical requirements of lining for hose only

The test for lining compound shall be in accordance with ISO 1817:2024, 9.4, and immersed in the liquids given in Table 3 for 70_0^{+2} hours at a test temperature of 50 °C for types A and B, and 80 °C for types C and D, the test piece shall show no decrease in volume, and any increase in volume shall not exceed the values given in Table 3.

Table 3 — Maximum increase in volume of test piece

Test liquid	Percentage increase in volume, max.	
	Types A and B	Types C and D
Toluene	10	5
Acetone	10	5
Ethanol	15	15
White spirit, commercial grade	—	5
Dioctylphthalate	—	5

10 Frequency of testing

Type testing and routine testing shall be as specified in Annex A.

Type tests are those tests required to confirm that a particular hose design, manufactured by a particular method, meets all the requirements of this document. They shall be performed on all sizes and on all types except those of the same size and construction.

The tests shall be repeated with a frequency defined by the manufacturer.

In case of a change in the method of manufacture or materials the relevant tests shall be performed to ensure that the hose is still in accordance with the requirements of this document after the change. The manufacturer is responsible for the selection of relevant tests.

Routine tests are those tests required to be carried out on each production lot of finished hose and hose assemblies.

11 Test report

A test report shall be supplied if requested by the customer. It shall include the following information:

a) the sample;

b) the International Standard used (including its year of publication);

c) the method used (if the standard includes several);

d) the result(s), including a reference to the clause which explains how the results were calculated;

e) any deviations from the procedure;

f) any unusual features observed;

g) the date of the test.

12 Marking

Each hose assembly shall be clearly and durably marked, at least every metre, with at least the following information:

a) the manufacturer's name or identification;

b) the manufacturer's product identification (optional);

c) the number of this document, i.e. ISO 8028;

d) the type of hose;

e) the working pressure, in MPa or bar, and maximum temperature, in degrees Celsius (°C);

f) the inside diameter, in millimetres;

g) the means of electrical conductivity (M or Ω);

h) the quarter and year of manufacture (e.g. 3Q23) and production lot number.

EXAMPLE XXX/ISO 8028/A/20 MPa/50 °C/8/M/3Q23 123A

For c), hose manufacturer shall use the latest publication of this document, otherwise the year of publication shall be included in the marking.

13 Recommendations for packaging and storage

Hose and hose assemblies should be packaged and stored as detailed in ISO 8331.