



SLOVENSKI STANDARD

SIST ISO 8795:1995

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Plastične cevi, namenjene za transport pitne vode - Izluževanje sestavin - Preskusna metoda

Plastics pipes for the transport of water intended for human consumption -- Extractability
of constituents -- Test method

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Tubes en matières plastiques pour l'alimentation en eau destinée à la consommation
humaine -- Extractabilité des constituants -- Méthode d'essai

[SIST ISO 8795:1995](https://standards.iteh.ai/catalog/standards/sist/42e81351-de28-4b74-a93c-2517f0c9e039/sist-iso-8795-1995)

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INTERNATIONAL STANDARD

ISO
8795

First edition
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Plastics pipes for the transport of water intended for human consumption — Extractability of constituents — Test method

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*Tubes en matières plastiques pour l'alimentation en eau destinée à la
consommation humaine — Extractibilité des constituants — Méthode
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Reference number
ISO 8795:1990(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 8795 was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*.

Annex A of this International Standard is for information only.

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Introduction

This International Standard concerns the extractability of constituents from plastics pipes used for the transport of water intended for human consumption. The constituents considered include the following: monomers; initiators; emulsifiers; emulsion stabilizers; stabilizers and antioxidants; lubricants; polymers and copolymers for blends; ultraviolet absorbers; fillers and pigments.

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Plastics pipes for the transport of water intended for human consumption — Extractability of constituents — Test method

1 Scope

This International Standard specifies a test method for the determination of the extractability of the prescribed constituents from the internal surface of plastics pipes to verify that the extracted quantities do not exceed specified limits.

It applies to all plastics pipes intended for the transport of water intended for human consumption under various conditions. It relates to all constituents which are extractable by drinking water from a finished pipe.

The pH and the temperature of the test water (simulant) and the exposure times have been chosen to cover extreme conditions. For each application and each material, the relevant conditions shall be as stated in the product standard.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was 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 recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods*.

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 extraction: Process of separating constituents from a substance using suitable solvents, carried out under specified conditions.

3.2 migration: Movement of substances from one material into another.

3.3 drinking water: Water of a quality intended for human consumption.

4 Principle

Prewashing of tubular test pieces for a specified time. Filling of the test pieces with acidified or alkalinized distilled water (simulated drinking water) at a fixed temperature and determination of the quantity of the extracted constituent after a fixed time.

5 Apparatus

5.1 Lengths of glass tube, fitted with a glass stopcock.

5.2 Stoppers, of an inert material which does not contain any constituent present in the test piece.

5.3 Heating equipment, capable of maintaining the temperature of the test piece together with its contents within the following ranges: $23\text{ °C} \pm 2\text{ °C}$, $27\text{ °C} \pm 1\text{ °C}$, $60\text{ °C} \pm 1\text{ °C}$, $70\text{ °C} \pm 1\text{ °C}$ and $90\text{ °C} \pm 1\text{ °C}$.

NOTE 1 The test temperature used is that indicated in the relevant product standard (see 8.2.2).

6 Materials

6.1 Distilled water, in accordance with grade 3 of ISO 3696.

6.2 Distilled water, adjusted to a pH of $7 \pm 0,1$ with a suitable buffer.

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6.3 Simulated drinking water

6.3.1 Acidic water, consisting of distilled water acidified to a pH of $4,5 \pm 0,1$ by bubbling a current of carbon dioxide through it.

6.3.2 Alkaline water, consisting of distilled water rendered alkaline to a pH of $11 \pm 0,1$ by using a suitable buffer solution, e.g. a mixture of 49,5 ml of a sodium hydroxide solution, $c(\text{NaOH}) = 0,1 \text{ mol/l}$, and 50,5 ml of a sodium tetraborate solution, $c(\text{Na}_2\text{B}_4\text{O}_7) \cdot 10\text{H}_2\text{O} = 0,05 \text{ mol/l}$.

7 Test pieces

For each test, take three pieces of the pipe, each at least 500 mm in length and with an internal volume at least equal to the volume of the extracting liquid required to determine, with the required precision, the amount of material which has migrated.

8 Test method**8.1 Prewashing**

8.1.1 Close one end of each test piece with one of the stoppers (5.2) which has been fitted centrally with a length of glass tube fitted with a stopcock (5.1).

8.1.2 Place the test pieces vertically with the open end upwards.

8.1.3 Let tap water flow into the test pieces in such a way that the linear rate of flow in the test piece, regulated using the stopcock, is approximately 3 m/min and the test pieces remain continuously full of water.

8.1.4 Maintain the water flow at ambient temperature for a period of 60 min $^{+10}_0$ min.

8.1.5 At the end of this period, stop the water flow, remove the stoppers and rinse out the test pieces using distilled water (6.1).

8.2 Extractability test

8.2.1 Close one end of each test piece, which has been subjected to the prewashing, using a stopper (5.2).

8.2.2 First extraction: fill each test piece with the chosen test water (simulated drinking water) (6.3). Close the other end of each test piece using a stopper (5.2) and maintain the filled test pieces at the test temperature specified in the relevant product standard for 48 h or 72 h.

8.2.3 At the end of this period, empty the test water from the test pieces into suitable containers and determine the amounts of any constituents present.

8.2.4 Second extraction: refill the test pieces with test water, close the open end of the test piece using a stopper and maintain the test pieces at the appropriate test temperature (see 8.2.2) for 48 h or 72 h.

For each extraction, use fresh test water.

At the end of this period, empty the test water from the test pieces and determine the amounts of any constituents present.

8.2.5 Third extraction: fill the test pieces a third time under the same conditions as described in 8.2.4. At the end of the 48 h or 72 h period, empty the test pieces and determine the amounts of any constituents present in the test water.

8.2.6 As the methods used for the analysis of the test water are extremely sensitive, carry out a blank test in parallel with the test on the pipe, following the same procedure and carrying out the same analyses, but using distilled water (6.2) instead of test water and a glass container or glass pipe, for instance, instead of the test piece.

The extraction time (48 h or 72 h) and the number of extractions shall be chosen according to national practice.

24 h may be used for extraction at 60 °C or higher.

9 Expression of results

Express the results in milligrams of a particular constituent per litre of test water used. The precision will depend on the analytical method used, but should preferably be at least 1 µg/l.

NOTE 2 An alternative way of expressing the results is in milligrams of constituent per square decimetre of surface of the test piece exposed to the extracting liquid.

10 Test report

The test report shall include the following information:

- a complete identification of the pipe sample tested (including the diameter and length of the test pieces, the wall thickness and the calculated internal surface area);
- the analytical method used for the determination of each constituent, and its precision;

- c) the quantities of each constituent found in each test piece after the first, second, third and any subsequent extractions;
- d) the arithmetic mean of the quantities of the constituent determined after the first, second, third and subsequent extractions;
- e) the pH of the test water;
- f) the temperature used;
- g) the extraction time;
- h) any deviation from the test procedure specified in this International Standard;
- i) any details which have not been provided for by this test procedure, and any incidents which might have affected the results.

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