
Cevi, fittingi in pribor iz duktilne železove litine - Zahteve in preskusne metode za notranje organske prevleke cevi in fittingov iz duktilne železove litine - 2. del: Termoplastična notranja prevleka cevi in fittingov iz modificiranega poliolefina (TMPO)

Ductile iron pipes, fittings and accessories - Requirements and test methods for organic linings of ductile iron pipes and fittings - Part 2: Thermoplastic Modified Polyolefin (TMPO) lining of pipes and fittings

Rohre, Formstücke und Zubehörteile aus duktilem Gusseisen - Anforderungen und Prüfverfahren für organische Auskleidungen von Rohren und Formstücken aus duktilem Gusseisen - Teil 2: Thermoplastisch modifizierte Polyolefin (TMPO)-Auskleidung von Rohren und Formstücken

Ta slovenski standard je istoveten z: prEN 15655-2

ICS:

23.040.10	Železne in jeklene cevi	Iron and steel pipes
23.040.40	Kovinski fittingi	Metal fittings

oSIST prEN 15655-2:2020

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 15655-2

December 2019

ICS 23.040.10; 23.040.40

Will supersede EN 15655:2009

English Version

**Ductile iron pipes, fittings and accessories - Requirements
and test methods for organic linings of ductile iron pipes
and fittings - Part 2: Thermoplastic Modified Polyolefin
(TMPO) lining of pipes**

Rohre, Formstücke und Zubehörteile aus duktilem Gusseisen - Anforderungen und Prüfverfahren für organische Auskleidungen von Rohren und Formstücken aus duktilem Gusseisen - Teil 2: Thermoplastisch modifizierte Polyolefin (TMPO)-Auskleidung von Rohren und Formstücken

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 203.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents		Page
European foreword		4
Introduction		5
1	Scope.....	6
2	Normative references.....	6
3	Terms and definitions	6
4	Ordering information.....	9
5	Technical requirements	9
5.1	Surface preparation	9
5.2	Finished TMPO lining	9
5.2.1	Appearance and continuity	9
5.2.2	Minimum lining thickness	9
5.3	Non-porosity.....	9
5.4	Pipe ends.....	10
5.5	Repairs.....	10
5.6	Marking	10
5.7	Adhesion	10
6	Performance Requirements.....	10
6.1	Chemical resistance (only for waste water).....	10
6.2	Indirect Impact strength	11
6.3	Resistance to ovalization	11
6.4	Elongation at break.....	11
6.5	Abrasion resistance (only for waste water application).....	11
6.6	Materials in contact with water intended for human consumption.....	11
7	Test Methods	12
7.1	Routine tests.....	12
7.1.1	General.....	12
7.1.2	Surface preparation	12
7.1.3	Appearance and continuity	12
7.1.4	Lining thickness.....	12
7.1.5	Pipe ends.....	12
7.1.6	Repairs.....	12
7.1.7	Marking	12
7.1.8	Non-porosity	12
7.1.9	Adhesion	13
7.2	Performance tests.....	13
7.2.1	General.....	13
7.2.2	Chemical resistance (only for waste water application).....	13
7.2.3	Indirect impact strength	13
7.2.4	Resistance to ovalization	14
7.2.5	Elongation at break.....	14
7.2.6	Abrasion resistance (only for waste water application).....	14
Annex A (informative) Quality assurance		15
A.1	General.....	15

A.2	Performance test - DN grouping	16
A.3	Quality assessment system	17
	Annex B (informative) Lining process and materials	18
B.1	Lining application process	18
B.2	Material properties	18
B.2.1	General	18
B.2.2	TMPO	18
B.2.3	Epoxy resin	18
B.3	Jet cleaning	18
	Annex C (informative) Packaging	19
	Bibliography	20

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 15655-2:2021

<https://standards.iteh.ai/catalog/standards/sist/6f9cfd63-216f-4657-9eac-d278140ecde8/sist-en-15655-2-2021>

prEN 15655-2:2019 (E)**European foreword**

This document (prEN 15655-2:2019) has been prepared by Technical Committee CEN/TC 203 “Cast iron pipes, fittings and their joints”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 15655:2009.

The main changes to EN 15655:2009 are:

- a) EN 15655 has been split into two parts. This part covers thermoplastic modified polyolefin lining of pipes;
- b) in Clause 3 the definition of “minimum lining thickness” has been revised (3.5);
- c) in 5.1 the values for the surface roughness have been changed;
- d) in 5.1 the surface temperature to be maintained above the dew point has been changed;
- e) in 5.2.2 Tables 1 and 2 for the minimum lining thickness have been revised;
- f) in 5.6 the technical requirements for the non-porosity have been revised;
- g) in 5.7 the requirement for the hardness 70 Shore D has been deleted;
- h) in 6.5 the ambient temperature has been increased;
- i) in 6.6 a reference to the CEN/TR 16950 “Ductile iron pipes, fittings and accessories — Sanitary characteristics and test methods” was added in a NOTE;
- j) in 7.1.8 the requirements for testing of non-porosity has been revised;
- k) in Table A.2 the requirements for the routine test of non-porosity (No.1) have been revised;
- l) the requirements for photoaging have been deleted;
- m) addition to informative annex that the manufacturer should provide infrared scans.

Introduction

This document is in conformity with the general requirements already established by CEN/TC 164 in the field of water supply (e.g. potable water) and CEN/TC 165 in the field of waste water.

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the product covered by this document:

- a) No information is provided as to whether the product can be used without restriction in any of the member states of the EU or EFTA;
- b) It is noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 15655-2:2021](https://standards.iteh.ai/catalog/standards/sist/6f9cfd63-216f-4657-9eac-d278140ecde8/sist-en-15655-2-2021)

<https://standards.iteh.ai/catalog/standards/sist/6f9cfd63-216f-4657-9eac-d278140ecde8/sist-en-15655-2-2021>

prEN 15655-2:2019 (E)**1 Scope**

This document defines the requirements and test methods applicable to factory applied internal thermoplastic modified polyolefin (TMPO) for the heavy duty corrosion protection of ductile iron pipes conforming to EN 545, EN 598 and EN 969. Fittings and accessories are covered separately by EN 14901-2.

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.

EN 545, *Ductile iron pipes, fittings, accessories and their joints for water pipelines - Requirements and test methods*

EN 598, *Ductile iron pipes, fittings, accessories and their joints for sewerage applications - Requirements and test methods*

EN 969, *Ductile iron pipes, fittings, accessories and their joints for gas pipelines - Requirements and test methods*

EN 14901-1, *Ductile iron pipes, fittings and accessories - Epoxy coating (heavy duty) of ductile iron fittings and accessories - Requirements and test methods*

EN 14901-2, *Ductile iron pipes, fittings and accessories - TMPO coating (heavy duty) of ductile iron fittings and accessories - Requirements and test methods*

EN ISO 4624, *Paints and varnishes - Pull-off test for adhesion (ISO 4624)*

EN ISO 4628-2, *Paints and varnishes - Evaluation of degradation of coatings. Designation of quantity and size of defects, and of intensity of uniform changes in appearance. Assessment of degree of blistering*

EN ISO 62, *Plastics — Determination of water absorption (ISO 62)*

EN ISO 527-3, *Plastics — Determination of tensile properties – Part 3: Test conditions for films and sheets (ISO 527-3)*

EN ISO 6272-1, *Paints and varnishes - Rapid-deformation (impact resistance) tests. Falling-weight test, large-area indenter*

EN ISO 8501-1, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings (ISO 8501-1)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1**ductile iron**

cast iron used for pipes, fittings and accessories in which graphite is present substantially in spheroidal form

3.2**adhesion**

force per unit area, applied perpendicular to the surface, which is necessary to separate the lining from its substrate

3.3**indirect impact strength**

impact energy applied from outside of the pipe with deformation to which a lining can withstand without damage under defined test conditions

3.4**hardness**

resistance of the lining to the penetration of a ball under defined test conditions

3.5**minimum lining thickness**

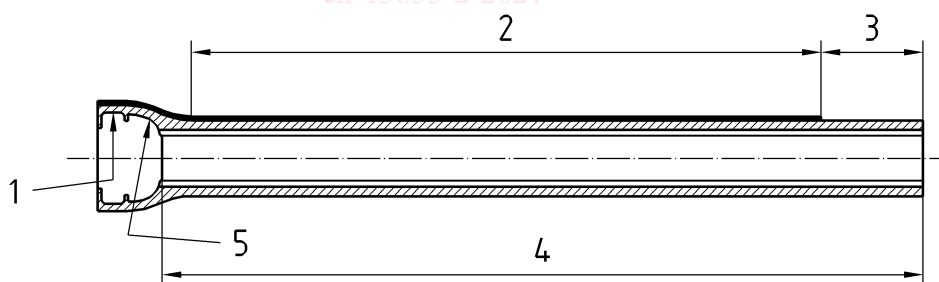
minimum value of the lining thickness measured at the lined item

3.6**non-porosity**

absence of holidays in a high voltage test under defined test conditions

3.7**TMPO lining**

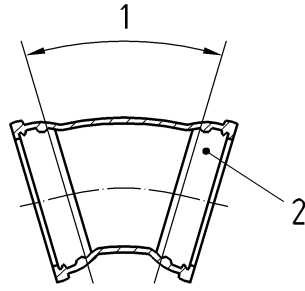
factory applied lining which consists of TMPO on the inside of the pipe

**Key**

- 1 gasket seat
- 2 pipe barrel
- 3 spigot end
- 4 lining
- 5 internal socket profile

Figure 1 — Location of the defined pipe areas

prEN 15655-2:2019 (E)

**Key**

- 1 lining
- 2 internal socket profile

Figure 2 — Location of the defined fitting areas**3.8****thermoplastic acid modified polyolefin powder material (TMPO powder)**

polyolefin resin in which a significant amount of carbon hydrogen chemical bonds are replaced by carboxylic acid functional groups

[SOURCE: EN 14901-2:2019]

3.9**specific lining resistance**

surface related electric resistance of the lining perpendicular to the pipe wall

3.10**performance test**

test which is done once and is repeated according to a schedule or after relevant change of lining material and/or material supplier or change in process application

3.11**routine test**

test carried out to control the manufacturing process with a frequency defined by the manufacturer

3.12**designated zones**

areas of a casting where because of jointing tolerance restrictions, testing difficulties, or shrouding by a gasket, etc. a lower standard of coating performance is unavoidable

Note 1 to entry: For the purpose of this standard these areas are defined as:

- joint areas;
- bolt holes;
- permitted markings;
- ribs;
- edges.

Note 2 to entry: Where considered necessary, these zones may be protected by appropriate additional corrosion protection measures during or after installation. However, such measures are not part of this document.

4 Ordering information

The following information shall be supplied by the purchaser to the manufacturer.

Ductile iron pipes or fittings according to EN 545, EN 598 or EN 969 but internally coated in accordance with this document shall be specified in the purchaser's enquiry and order by reference to this document, e.g.

- 5 000 m of ductile iron pipe DN 300 according to EN 545, internal TMPO-lining according to EN 15655-2; or
- further information about use and handling, if needed.

5 Technical requirements

5.1 Surface preparation

Surface preparation shall be designed in order to reach the required performances specified in this document. It is the responsibility of the manufacturer to demonstrate the fitness for purpose of surface preparation technology and to put in place a quality control procedure to ensure the stability of those performances (see 7.1.2).

5.2 Finished TMPO lining

5.2.1 Appearance and continuity

The TMPO lining shall be checked in accordance with 7.1.3 and be of:

- uniform colour, except the spigot end and the internal socket profile which may be of a different colour and/or different coating material;
- uniform appearance and smoothness except for admissible repairs;
- free of visible defects (pinholes, bubbles, blisters, wrinkles, cracks or voids).

Slight superficial variations of colour or brilliance due to repairs or prolonged exposure to sunlight or contact with other pipes are permissible.

5.2.2 Minimum lining thickness

When measured in accordance with the method defined in 7.1.4, except on designated zones, the localized minimum thickness shall be greater than 300 μm and the minimum average thickness shall be equal to or greater than 350 μm . For designated zones (see 3.12), localized minimum thickness of 200 μm is permissible.

5.3 Non-porosity

When tested in accordance with the test method described in 7.1.8 with a tension of 1 500 V, the coated body of the component shall be free from porosity i.e. no electrical puncture shall occur. In designated zones, electrical punctures are permitted.