



SLOVENSKI STANDARD
SIST-TP CEN/TR 15545:2007
01-april-2007

Vodilo za uporabo standarda EN 545

Guide to the use of EN 545

Anleitung zur Anwendung der Norm EN 545

Guide d'utilisation de l'EN 545

ITEH STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: CEN/TR 15545:2006

[SIST-TP CEN/TR 15545:2007](https://standards.iteh.ai/catalog/standards/sist/f2c51921-8585-4880-929a-db06ac8b8185/sist-tp-cen-tr-15545-2007)

<https://standards.iteh.ai/catalog/standards/sist/f2c51921-8585-4880-929a-db06ac8b8185/sist-tp-cen-tr-15545-2007>

ICS:

23.040.10	Železne in jeklene cevi	Iron and steel pipes
23.040.40	Kovinski fittingi	Metal fittings
91.140.60	Sistemi za oskrbo z vodo	Water supply systems

SIST-TP CEN/TR 15545:2007

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST-TP CEN/TR 15545:2007](#)

<https://standards.iteh.ai/catalog/standards/sist/f2c51921-8585-4880-929a-db06ac8b8185/sist-tp-cen-tr-15545-2007>

TECHNICAL REPORT
RAPPORT TECHNIQUE
TECHNISCHER BERICHT

CEN/TR 15545

December 2006

ICS 23.040.10; 23.040.40

English Version

Guide to the use of EN 545

Guide d'utilisation de l'EN 545

Anleitung zur Anwendung der Norm EN 545

This Technical Report was approved by CEN on 28 August 2006. It has been drawn up by the Technical Committee CEN/TC 203.

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

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST-TP CEN/TR 15545:2007](https://standards.iteh.ai/catalog/standards/sist/f2c51921-8585-4880-929a-db06ac8b8185/sist-tp-cen-tr-15545-2007)

<https://standards.iteh.ai/catalog/standards/sist/f2c51921-8585-4880-929a-db06ac8b8185/sist-tp-cen-tr-15545-2007>



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Page

Foreword.....	3
1 Scope	4
4.1.4 Materials in contact with water intended for human consumption	4
6.6 Zinc mass	4
7 Performance test methods	5
7.1 Compressive strength of the cement mortar lining	5
7.2 Leak tightness of flexible joints to positive internal pressure.....	5
7.3 Leak tightness of flexible joints to negative internal pressure.....	6
7.4 Leak tightness of flexible push-in joints to positive external pressure.....	6
7.5 Leak tightness of flexible joints to dynamic internal pressure.....	6
7.6 Leak tightness and mechanical resistance of flanged joints.....	6
7.7 Leak tightness and mechanical resistance of screwed and welded flanges	6
Annex F (informative) Quality assurance.....	7
F.1 Performance tests	7
F.2 Manufacturing process	7
F.2.1 Quality Control.....	7
F.2.2 Initial performance testing.....	7
F.2.3 Factory Production Control System	8
F.2.3.1 Organisation.....	8
F.2.3.2 Control system.....	8
F.2.3.3. Document control.....	10
F.2.3.4 Process control.....	11
F.2.3.5 Inspection and testing.....	11
F.2.3.6 Non-conforming products	11
Bibliography	12

ITih STANDARD PREVIEW
(standards.iteh.ai)

SIST-TP CEN/TR 15545:2007

<https://standards.iteh.ai/catalog/standards/sist/2c51921-8585-4880-929a->

[db06ac8b8185/sist-tp-cen-tr-15545-2007](https://standards.iteh.ai/catalog/standards/sist/2c51921-8585-4880-929a-d806ac8b8185/sist-tp-cen-tr-15545-2007)

Foreword

This document (CEN/TR 15545:2006) has been prepared by Technical Committee CEN/TC 203 “Cast iron pipes, fittings and their accessories”, the secretariat of which is held by AFNOR.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

EN 545 deals with components of piping systems for water - pipes, fittings and joints – which, together, form the part of a water network. Each of these components can be manufactured by a different supplier, which is often the reality; the performances and the tests required by EN 545, although perfectly comprehensive, are not always formulated with enough accuracy to be easily used in every real situation occurring the market.

In regard to quality assurance, the attestations and certifications of conformity to the standards available on the markets:

- attestation of compliance to the performance tests;
- certification of conformity of the products of a batch;
- certification of conformity to EN ISO 9001 of the supplier;
- national quality or conformity marks;
- third party certification of conformity of products to a standard,
- self-declaration of conformity to a standard by the supplier for products that he sells,

have different meanings for the customer, who generally needs all products to be fully in compliance with this standard.

CEN/TR 15545:2006 (E)**1 Scope**

EN 545 specifies the requirements and associated test methods applicable to ductile iron pipes, fittings, accessories and their joints for the construction of pipelines:

- to convey water (e.g. potable water);
- with or without pressure;
- to be installed below or above ground.

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

- this standard provides no information as to whether the product may be used without restriction in any of the member states of the EU or EFTA;
- it should be 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.

This technical report:

- explains in more detail the process of testing for the performance tests;
- explains in more detail the definitions of the different types/levels of attestation to enable customers to ensure their requirements are fulfilled;
- explains in more detail the ways of certification of conformity with EN 545 for a reliable evaluation of the performance of the products.

<https://standards.iteh.ai/catalog/standards/sist/2c51921-8585-4880-929a-1b06a0812185/sist-tp-cen-tr-15545-2007>

In order to make the use of this Technical Report easier, the clauses of this document refer to the corresponding clause numbers in EN 545.

4.1.4 Materials in contact with water intended for human consumption

A comprehensive potability regulation concerning components of pipes systems means:

- regulatory obligation (i.e.: decree, law....);
- technical specifications;
- tests methods to verify the compliance with the technical specifications;
- directory of approved laboratories able to carry out these tests.

On October the 1st 2005, there was a national regulation in the following countries: Austria, France, Germany, Italy, Netherlands, Switzerland and United Kingdom.

In all cases, the national regulations remain in force and must be followed.

6.6 Zinc mass

EN 545 states that a rectangular token of known weight per unit area shall be attached longitudinally along the axis of the pipe before passing through the coating equipment. After zinc coating and trimming, the size of the

token shall be 500 mm x 50 mm. It shall be weighed on a scale having an error limit of $\pm 0,01$ g. The mean mass is then determined in accordance with the remainder of clause 6.6.

As this test can only be carried out in the factory, conformity certification using this test method can only be acquired and granted in the factory during the manufacturing process and not on a batch of finished products.

7 Performance test methods

7.1 Compressive strength of the cement mortar lining

This test should be carried out using the actual constituents used in the manufacture of the cement mortar for the pipes. As such the sand, cement and water should be sampled from the dispensing/holding facilities in the factory. Similarly, the sand/cement/water ratios should be identical to those used in the manufacturing process (in the case of the sprayed mortar process, these ratios are identical to the ratio in the mortar mixer, whereas for the centrifugal process, these ratios are those found in the compacted lining after centrifugal spinning). Third party accreditation can thus only be granted once these strict conditions have been established and it is for this reason that it is recommended that these tests be only carried out in the factory.

7.2 Leak tightness of flexible joints to positive internal pressure

The test shall be carried out in accordance with clause 7.2 of EN 545 on an assembled joint comprising two pipe sections, each at least 1 m long. It shall be carried out separately for other components such as fittings if their socket differs from that of the spun pipes. For such a test a flange-socket fitting (see 8.3.1 of EN 545) shall be bolted to a flanged pipe of sufficient length to satisfy the requirements of clause 7.2. Tests shall be carried out on both unrestrained and restrained joints as necessary.

- Short and long term characteristics of the rubber for the gaskets shall be shown to be in compliance with EN 681-1.
- Relevant designs of socket and gasket throughout all possible tolerance combinations shall:
 - ensure leak tightness at minimum compression under shear and/or angular deflection;
 - ensure both leak tightness and satisfactory anchorage under shear and/or angular deflection.
- The short and long term characteristics of the rubber for the gaskets shall be shown to be in compliance with EN 681-1.
- Using an established gasket, the relevant designs of sockets/spigots shall be shown to be compatible throughout all possible tolerance combinations (see clause 7.2.3) and shall:
 - ensure leak tightness at minimum compression under shear and/or angular deflection;
 - ensure both leak tightness and satisfactory anchorage (restrained joint) under shear and/or angular deflection – especially important where different suppliers of pipes/fittings and gaskets are involved.

The following joint parameters are considered vital to the performance of a joint and shall be checked to be in accordance with the relevant specifications:

- wall thickness;
- external diameter of spigot;
- socket internal functional diameters;
- depth of socket;
- gasket diameters and thicknesses.

CEN/TR 15545:2006 (E)**7.3 Leak tightness of flexible joints to negative internal pressure**

See 7.2

7.4 Leak tightness of flexible push-in joints to positive external pressure

See 7.2

7.5 Leak tightness of flexible joints to dynamic internal pressure

See 7.2

7.6 Leak tightness and mechanical resistance of flanged joints

This test shall be carried out in accordance with clause 7.6 of EN 545 on an assembly comprising two pipes or fittings with identical flanges, together with a relevant gasket and bolts recommended by the manufacturer. It is important that rubber gaskets shall be shown to have the short and long term properties as defined in EN 681-1, in particular that the hardness (IRHD) is within specification. Similarly it is important that the manufacturers jointing instructions are followed for each particular gasket/material in regard to torque values and lubrication for the bolts. The sealing of flange joints depends on many factors and the manufacturer should have written specifications for:

- flange joint faces – surface finish, flatness, permissible irregularities;
- flange jointing materials – bolt lengths/grades, recommended gasket materials,
- jointing instructions – bolt torques, lubrication, bolt tightening sequence.

7.7 Leak tightness and mechanical resistance of screwed and welded flanges

This test shall be carried out in accordance with clause 7.7 of EN 545 on an assembly comprising two pipes with identical flanges together with a relevant gasket and bolts. This test is primarily a strength test for the weld/screwed connection and as such is very demanding – twice the working pressure (PFA) combined with four times the design bending moment. The test is carried out on a pipe purposely machined to its minimum thickness. The pipes must be of sufficient length to allow the imposition of the high bending moment: minimum 6 DN or 4 000 mm, whichever is the smallest. Because the elevated pressures and bending moments, applied in the test, result in loadings well in excess of normal service, special gaskets and/or bolts may be used for the test in order to attain the high stress on the weld/screwed connection.

Because this is a specialist test on pipes that can only be welded/screwed by the manufacturer, the test can usually only be carried out and third party certified in the factory.

Annex F (informative)

Quality assurance

EN 545 defines that the manufacturer has the responsibility to demonstrate the conformity of his or her products with this standard by:

- carrying out performance tests, and
- controlling the manufacturing process.

F.1 Performance tests

The performance tests specified in clauses 5 and 7 of EN 545 are carried out either by the manufacturer or, at his or her request, by a competent testing institute in order to demonstrate compliance with the requirements of that standard. Full reports of these performance tests are retained by the manufacturer as evidence of compliance.

The performance tests alone are not proof of the product conformity with the standard; they are absolutely necessary, but are only one part of the much wider conformity requirements set out in EN 545.

(standards.iteh.ai)

F.2 Manufacturing process

[SIST-TP CEN/TR 15545:2007](https://standards.iteh.ai/catalog/standards/sist/f2c51921-8585-4880-929a-db06ac8b8185/sist-tp-cen-tr-15545-2007)

F.2.1 Quality Control

It is recommended that:

- manufacturer's quality system conforms to EN ISO 9001;
- certification body is accredited to EN ISO/IEC 17021 by an accreditation body which has signed the European Accreditation agreement;

If third party certification is involved to deliver an attestation of conformity of the products to EN 545, it is recommended that the certification body is accredited to EN 45011 by an accreditation body which has signed the European Accreditation agreement

F.2.2 Initial performance testing

Samples of prototypes (pipes, fittings and joints) for each range of DN (see Table F.1) should pass all the performance tests listed in Table F.1 to demonstrate conformance with clause 5, before production commences. Tests are normally carried out with the manufacturer's calibrated equipment.

In case of significant changes in design of the product and/or in manufacturing process, which would change the properties of the finished product, the relevant performance tests should be repeated.

In addition, the performance tests in accordance with clause 7 of EN 545 may be carried out by a competent third party, accredited in accordance with EN 45011 in order to demonstrate compliance with the requirements of EN 545. Full reports of these performance tests are retained by the manufacturer as evidence of compliance and upon request are to be made available for examination.