

SLOVENSKI STANDARD

oSIST prEN ISO 377:2017

01-april-2017

Jeklo in jekleni izdelki - Mesto jemanja in priprava vzorcev ter preskušanci za mehansko preskušanje (ISO/FDIS 377:2017)

Steel and steel products - Location and preparation of samples and test pieces for mechanical testing (ISO/FDIS 377:2017)

Stahl und Stahlerzeugnisse - Lage und Vorbereitung von Probenabschnitten und Proben für mechanische Prüfungen (ISO/FDIS 377:2017)

Acier et produits en acier - Position et préparation des échantillons et éprouvettes pour essais mécaniques (ISO/FDIS 377:2017)

Ta slovenski standard je istoveten z: prEN ISO 377

ICS:

77.040.10	Mehansko preskušanje kovin	Mechanical testing of metals
77.140.01	Železni in jekleni izdelki na splošno	Iron and steel products in general

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STANDARD

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Steel and steel products — Location and preparation of samples and test pieces for mechanical testing

Acier et produits en acier — Position et préparation des échantillons et éprouvettes pour essais mécaniques

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ISO/FDIS 377:2017(E)

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 documents 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 on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 20, *General technical delivery conditions, sampling and mechanical testing methods*.

This fourth edition cancels and replaces the third edition (ISO 377:2013), of which it constitutes a minor revision to correct [Figure A.13 b](#).

Steel and steel products — Location and preparation of samples and test pieces for mechanical testing

1 Scope

This document specifies requirements for the identification, location and preparation of samples and test pieces intended for mechanical tests on steel sections, bars, rod, flat products and tubular products as defined in ISO 6929. If agreed in the order, this document can also apply to other metallic products. These samples and test pieces are for use in tests that are carried out in conformity with the methods specified in the product or material standard or, in the absence of this, in the standard for the test method.

Where the requirements of the order or product standard differ from those given in this document, then the requirements of the order or product standard apply.

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 3785, *Metallic materials — Designation of test specimen axes in relation to product texture*

ISO 6929, *Steel products — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6929 and the following 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

test unit

number of pieces or the tonnage of products to accept or reject together, on the basis of the verification tests carried out on sample products in accordance with the requirements of the product standard or order

Note 1 to entry: See [Figure 1](#).

3.2

sample product

item (e.g. bar, sheet, coil) selected for inspection or testing

Note 1 to entry: See [Figure 1](#).

3.3

sample

sufficient quantity of material taken from the sample product for the purpose of producing one or more test pieces

Note 1 to entry: See [Figure 1](#).

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Note 2 to entry: In certain cases, the sample can be the sample product.

3.4 rough specimen

part of a sample having undergone mechanical treatment, for the purpose of producing a test piece

Note 1 to entry: See [Figure 1](#).

3.5 test piece

part of a sample or rough specimen, with specified dimensions, machined or unmachined, brought to a required condition for submission to a given verification test

Note 1 to entry: See [Figure 1](#).

Note 2 to entry: In certain cases, the test piece can be the sample or the rough specimen.

3.6 reference condition

condition of a sample, rough specimen or test piece having undergone a heat treatment to represent the intended final condition of the product

Note 1 to entry: In such cases, the sample, rough specimen or test piece is called the reference sample, reference rough specimen or reference test piece.

4 General requirements

4.1 Representative testing

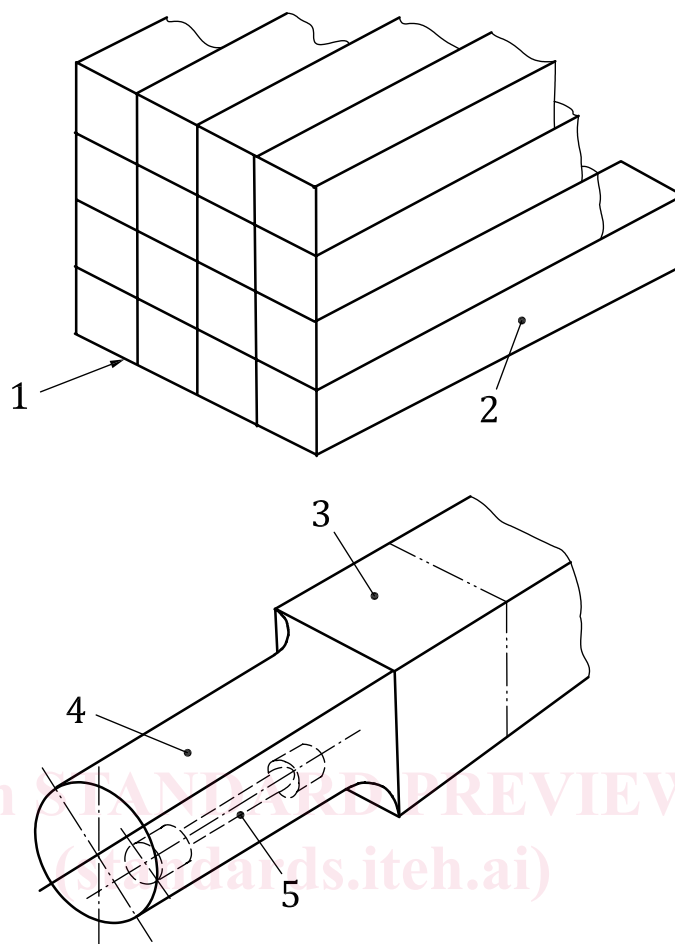
Sample, rough specimens and test pieces selected in accordance with [Annex A](#) shall be considered to be representative of the product.

NOTE As a result of their production sequence, e.g. melting, casting hot or cold forming or both, heat treatment, etc., steel products are not homogeneous. The mechanical properties of samples taken from other locations can be different.

4.2 Identification of sample products, samples, rough specimens and test pieces

Sample products, samples, rough specimens and test pieces shall be marked to ensure traceability to the original product and their location and orientation in that product. For this purpose, if, during the preparation of any one or more of the samples, rough specimens or test pieces, removal of the marks cannot be avoided, transfer of these marks shall be carried out before the existing marks are removed or, in the case of automatic preparation, equipment before the test piece is removed from the equipment. In the case of specific inspection and where requested by the purchaser, the transfer of the marks shall be carried out in the presence of the purchaser's representative.

In the case of fully automatic in line preparation and testing systems, marking of samples, rough specimens and test pieces is not necessary if an adequate control system exists, which defines the procedures to follow in the event of system failure.

**Key**

- 1 test unit (3.1)
- 2 sample product (3.2)
- 3 samples (3.3)
- 4 rough specimen (3.4)
- 5 test piece (3.5)

Figure 1 — Examples of terms defined in [Clause 3](#)

5 Preparation of samples and selection of test pieces

5.1 Selection and dimensions of samples and location of test pieces

The sample shall be selected so that the test piece can be located as indicated in [Annex A](#). The sample shall have sufficient dimensions to allow sufficient test pieces required for carrying out specified tests, and for any retests that are necessary.

5.2 Direction of axis of test pieces

The direction of the test piece axis relative to the principle direction of working shall be as specified in the appropriate product standard or order. The designation of the test piece axis shall be in accordance with ISO 3785.

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5.3 Condition and separation of samples

5.3.1 General

The material or product standard shall specify whether the test is intended to determine the properties

- a) in the as-delivered condition (see 5.3.2), or
- b) in the reference condition (see 5.3.3).

5.3.2 Testing in the as-delivered condition

A sample intended for testing in the as-delivered condition shall be separated from the product either

- a) after the forming or heat treatment processes or both have been completed, or
- b) before the heat treatment process, in which case the heat treatment of the separated sample shall be carried out under the same conditions as that of the product.

Separation of the sample shall be carried out in such a manner so as not to change the characteristics of that part of the sample used to provide the test pieces.

If flattening or straightening of the sample is unavoidable in the preparation of the test piece, the flattening or straightening shall be carried out cold unless otherwise specified in the product standard.

5.3.3 Testing in the reference condition

5.3.3.1 Sample

A sample intended for testing in the reference condition shall be separated from the product at the stage of manufacture specified in the product standard or order.¹⁷

Separation of the sample shall be carried out in such a manner so as not to change the characteristics of that part of the sample used to provide the test pieces after heat treatment.

Flattening or straightening, if necessary, can be carried out either hot or cold before any heat treatment. When carried out hot, it shall be at a temperature below the final heat treatment temperature.

5.3.3.2 Rough specimen

A rough specimen intended for testing in the reference condition shall be prepared as follows.

- a) Mechanical treatment prior to heat treatment: when the sample is made smaller for the process of heat treatment, the product standard shall specify the dimensions to which the rough specimen shall be reduced and the reduction process e.g. forging, rolling, machining.
- b) Heat treatment: the heat treatment of the rough specimen shall take place in an environment where the uniformity of the temperature is adequately ensured and the temperature is measured by means of a calibrated instrument. The heat treatment shall be in accordance with the requirements of the product standard or of the order.

6 Preparation of test pieces

6.1 Cutting and machining

Cutting and machining of samples and rough specimens for the preparation of test pieces shall be carried out taking such precautions as necessary to avoid superficial work hardening and heating of the material likely to change the mechanical characteristics. After machining, any marks left by the tool that can interfere with the results of the test shall be removed, either by grinding (with ample coolant

supply) or by polishing, provided that the chosen method of finishing maintains the dimensions and shape of the test piece within the tolerances specified in the standard for the appropriate test.

The tolerances on the dimensions of the test pieces shall be those specified in the standards for the appropriate test methods.

6.2 Reference heat treatment

When the required reference heat treatment is being carried out on the test piece, the provisions for heat treatment shall be the same as for the rough specimen [see [5.3.3.2 b](#)].

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