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Replacing GB/T 2975-1998

Steel and Steel Products - Location and Preparation of Samples and Test Pieces for Mechanical Testing

(ISO 377:2017, MOD)

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Standardization Administration Committee of the People's Republic of China.

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Foreword

This Standard is drafted in accordance with stipulations in GB/T 1.1-2009.

This Standard serves as a replacement of GB/T 2975-1998 Steel and Steel Products - Location and Preparation of Test Pieces for Mechanical Testing. In comparison with GB/T 2975-1998, there are several main changes of technical content as follows:

---Specific requirement of sample designation is added (please refer to 4.2);

---The term “leg part” is modified into “flange”; the “waist part” is modified into “ventral shield” in section steel (please refer to A.2 in Version 1998);

---The requirement of sampling location of impact test piece along the thickness direction of flange of section steel is modified (please refer to Figure A.3 in Version 1998);

---The requirement of taking tensile billet sample of steel plate under the thickness of 25 mm ≤ t < 50 mm is deleted; the requirement of taking tensile billet sample of steel plate under the thickness of t ≥ 25 mm is unified (please refer to Figure A.10);

---The requirement of taking tensile billet sample of tempered or thermomechanical rolled (TMCP) steel plate is added (please refer to A.6.2.2 and footnote b of Figure A.10);

---The requirement of sampling location of impact billet of steel with thickness that is more than 40 mm is refined; optional requirements of sampling of steel plate under the thickness of 28 mm ≤ t < 40 mm are added (please refer to A.6.3 and Figure A.11; A.4.4 in Version 1998);

---The minimum thickness or diameter of steel products under machining allowance is modified from 20 mm into 12.5 mm; relevant content of “the selection of laser-cutting machining allowance” is increased (please refer to Appendix B).

This Standard is modified in accordance with the re-drafting law and ISO 377: 2017 Steel and Steel Products - Location and Preparation of Samples and Test Pieces for Mechanical Testing.

In comparison with ISO 377: 2017, there are several technical differences. Please see the technical differences and the causes for these differences below. Clauses that involve these differences are already indicated through longitudinal single line (|) in the blank of the outer margin.

---In terms of normative references, certain adjustment with technical differences

Steel and Steel Products - Location and Preparation of Samples and Test Pieces for Mechanical Testing

1 Scope

This Standard specifies the designation, sampling location and preparation requirements of mechanical testing of section steel, steel bar, steel wire rod, steel plate and steel pipe defined in GB/T 15574.

This Standard is applicable to the sampling and preparation of samples and test pieces for mechanical testing of steel and steel products. If it is indicated in the contract, this Standard is also applicable to other metal products. These test materials and samples can be tested in accordance with relevant product standards, material standards or test standards.

2 Normative References

The following documents are indispensable to the application of this Standard. In terms of references with a specified date, only versions with a specified date are applicable to this Standard. The latest version (including all the modifications) of references without a specified date is also applicable to this Standard.

GB/T 15574 Steel Products Classification (GB/T 15574-2016, ISO 6929: 2013, IDT)

GB/T 20832 Metallic Materials - Designation of Test Specimen Axes in Relation to Product Texture (GB/T 20832-2007, ISO 3785: 2006, IDT)

3 Terms and Definitions

The following terms and definitions, and the terms and definitions defined in GB/T 15574 are applicable to this document.

3.1 Test Unit

Test unit refers to the number or tonnage of products that are accepted or rejected in accordance with product standards or contract requirements, and the result of sampling test.

NOTE: please refer to Figure 1.

3.2 Sample Product

NOTE: since there are different modes of manufacturing, such as smelting, casting, thermal or cold forming (or both), and thermal treatment, which leads to inhomogeneous steel products, the mechanical properties of sample that is taken from other locations also might differ.

4.2 Designation of Sample Product, Sample, Rough Specimen and Test Piece

4.2.1 Sample product, sample, rough specimen and test piece shall be designated to make sure the traceability to the original product, and their location and direction in the original product. In consideration of this, if the designations (one or several) of sample product, sample, rough specimen and test piece must be eliminated during the sampling process, these designations must be properly transferred before they are eliminated or before the sample is taken out from automatic sample preparation equipment. When test is stipulated, or when the demand side has a demand for test, the transfer of designation must be in the presence of the demand side's representative.

4.2.2 In terms of full-automatic online sample preparation and test system, if a complete control system is equipped, and it can respond in accordance with the pre-established program in case of system failure, then, it is unnecessary to designate sample product, sample, rough specimen and test piece.

5 Sample Preparation and Test Piece Selection

5.1 Selection and Dimension of Sample, and Location of Test Piece

The selection of sample shall comply with the locations indicated in Appendix A. Sample shall be in a sufficient dimension, so that sufficient test pieces can be taken for stipulated test and necessary re-inspection.

5.2 Axial Direction of Test Piece

The relations between test piece's axial direction and product's primary processing direction shall be stipulated in corresponding product standard or contract. The determination of test piece's axis shall comply with the requirement in GB/T 20832.

5.3 Condition and Preparation of Sample

5.3.1 Overview

In accordance with the stipulation in product standard or contract, the conditions of sample can be divided into:

a) Test under the condition of delivery (please refer to 5.3.2);

b) Test under reference condition (please refer to 5.3.3).

Appendix A

(Normative)

Sampling Location of Test Piece and Sample

A.1 General Requirements

A.1.1 This appendix is applicable to the sampling location of the following products:

---Section steel;

---Steel bar and steel wire rod;

---Steel plate;

---Steel pipe.

A.1.2 Please refer to Figure A.1 ~ Figure A.15 for the sampling location of test piece for tensile and impact test.

A.1.3 In terms of bending test, the sampling location along the width direction shall be the same as the tensile test piece; at least one original surface of the test piece shall be retained.

A.1.4 When more than 1 test pieces are requested, take the test piece in an adjacent area of the stipulated location.

A.2 Section Steel

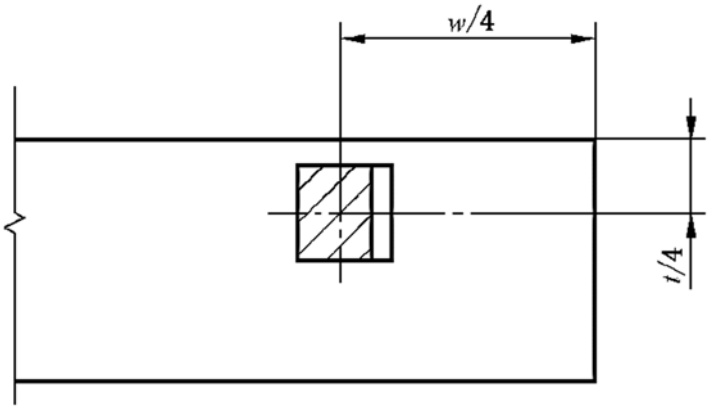
A.2.1 Sampling location of section steel along the width direction

A.2.1.1 Please refer to Figure A.1 for the sampling location of section steel along the width direction.

A.2.1.2 In terms of section steel with slanted flange, test piece can be taken from the ventral shield [please refer to Figure A.1 b) and d)]; through negotiation, it is also allowable to take test piece from the flange for machining.

A.2.1.3 In terms of product with a dimension of over 150 mm and flange that is not slanted, take tensile test piece from the flange [please refer to A.1 f)]. In terms of other products, if it is stipulated in product standard, test piece can be taken from the ventral shield.

A.2.1.4 In terms of angle steel with uneven length of flange, test piece can be taken from any flange.



d) 28 mm ≤ t < 40 mm (optional)

Figure A.11 -- Steel Plate - Sampling Location of Impact Test Piece (please refer to A.6.2)

A.7 Steel Pipe

A.7.1 Steel pipe and round hollow section steel

A.7.1.1 Tensile test piece

A.7.1.1.1 Please refer to Figure A.12 for the sampling location of tensile test piece. When machining and testing machine capability allows, full-section test piece shall be taken [please refer to Figure A.12 a)].

A.7.1.1.2 In terms of welded pipe, when strip test piece needs to be taken to test the performance of welding seam, the welding seam shall be located in the center of the test piece.

A.7.1.1.3 If the sampling location is not stipulated in product standard or contract, it shall be selected by the manufacturing factory.

A.7.1.2 Impact test piece

A.7.1.2.1 Please refer to Figure A.13 for the sampling location of impact test piece of seamless pipe and welded pipe.

A.7.1.2.2 If the sampling location is not stipulated in product standard or contract, it shall be selected by the manufacturing factory.

A.7.1.2.3 The sampling direction shall be determined by the dimension of the pipe. When it is stipulated to take transversal test piece, take the maximum thickness of test piece between 5 mm ~ 10 mm.

A.7.1.2.4 The minimum (nominal) diameter D_{min} of pipe that is needed for the sampling of transversal test piece is provided in Formula (A.1) below:

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