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

*Matériaux métalliques — Désignation des axes des éprouvettes en
relation avec la texture du produit*





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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.

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 of the voluntary nature of standards, 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 4, *Fatigue, fracture and toughness testing*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 459/SC 1, *Test methods for steel (other than chemical analysis)*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 3785:2006), which has been technically revised.

The main changes are as follows:

- a reference to [Annex A](#) was added in the Introduction;
- in [6.5](#) a reference to ISO 15653 was added;
- a new [Subclause 6.6](#) (Additive manufacturing) was added.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The measured mechanical properties of a metallic product, especially those characterizing ductility and toughness, such as elongation, reduction of area, fracture toughness and impact resistance, are dependent on the test specimen location within the product and orientation with respect to the product's principal directions of metal working, grain flow or otherwise-produced texture. This document specifies a method for designating specimen orientation in relation to product texture.

Additional information on the influence of mechanical working on material structure and properties is provided in [Annex A](#).

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

1 Scope

This document specifies a method for designating test specimen axes in relation to product texture by means of an X-Y-Z orthogonal coordinate system.

This document applies equally to unnotched and notched (or precracked) test specimens.

This document is intended only for metallic materials with uniform texture that can be unambiguously determined.

Test specimen orientation is decided before specimen machining, identified in accordance with the designation system specified in this document, and recorded.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

4 Designation system

4.1 General

The method for relating specimen axes to the characteristic directions of the product makes use of an X-Y-Z orthogonal coordinate system for wrought metals:

- the letter X always denotes the direction of principal deformation (maximum grain flow in the product);
- the letter Y denotes the direction of least deformation;
- the letter Z denotes the direction normal to the X-Y plane.

4.2 Exception — not aligned

When the specimen direction does not coincide with the product's characteristic grain-flow directions, two letters are used as described for unnotched specimens in [5.2.2](#) and [5.2.4](#), and for notched specimens in [6.3](#).