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BSI Standards Publication

Steel products with improved deformation properties perpendicular to the surface of the product – Technical delivery conditions

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National foreword

This British Standard is the UK implementation of EN 10164:2018. It supersedes BS EN 10164:2004, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ISE/103, Structural Steels Other Than Reinforcements.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Amendments/corrigenda issued since publication

Date	Text affected
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EUROPÄISCHE NORM

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ICS 77.140.50; 77.140.70

Supersedes EN 10164:2004

English Version

Steel products with improved deformation properties perpendicular to the surface of the product - Technical delivery conditions

Aciers de construction à caractéristiques
de déformation améliorées dans le sens
perpendiculaire à la surface du produit -
Conditions techniques de livraison

Stahlerzeugnisse mit verbesserten
Verformungseigenschaften senkrecht zur
Erzeugnisoberfläche - Technische Lieferbedingungen

This European Standard was approved by CEN on 16 May 2018.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (EN 10164:2018) has been prepared by Technical Committee ECISS/TC 103 "Structural steels other than reinforcements", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2019, and conflicting national standards shall be withdrawn at the latest by April 2019.

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

This document supersedes EN 10164:2004.

The main changes with respect to the previous edition are listed below:

- a) Normative references added and updated;
- b) Clauses 6.1 and 6.2 revised;
- c) Clause 8.2.2.2.3 c) is applicable for thicknesses $20 \text{ mm} < t \leq 80 \text{ mm}$;
- d) Figure 1 and 4 revised;
- e) Clause 12 revised;
- f) Standard editorial revised.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

Flat products and sections of steel as normally manufactured have deformation properties perpendicular to the surface (through thickness) which are different from those obtained in the surface direction. This anisotropy of the properties may lead to difficulties in welded structures, for instance lamellar tearing.

It is, however, possible to improve the through thickness properties by using additional steel making procedures.

Through thickness properties are characterized in this document by specified values for reduction of area in a through thickness tensile test.

The minimum values for reduction of area in this document cannot by themselves be regarded as ensuring safety against occurrence of lamellar tearing. Indeed, the risk of lamellar tearing is also basically influenced for instance by the type of structure, weld design and welding procedure.

However, the reduction of area is a good general guide to lamellar tear resistance, i.e. the risk of lamellar tearing decreases with increased reduction of area in the through thickness tensile test.

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1 Scope

This document specifies deformation properties perpendicular to the surface of the product.

This document can be applied as a supplement to all product standards for flat products and sections of fully killed steels, except stainless steels. It covers products having a nominal thickness (t) between 15 mm and 400 mm of steels with a specified minimum upper yield strength R_{eH} or proof strength $R_{p0,2} \leq 960 \text{ MPa}$ ¹⁾ for which improved through thickness properties are required.

This document can be applied to other steel types if agreed at the time of the order.

This document can be applied to products with thickness between $10 \text{ mm} \leq t < 15 \text{ mm}$ if agreed at the time of the order. See option 1.

This document can be applied to products with thickness $t > 400 \text{ mm}$ if agreed at the time of the order. See option 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 ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1)*

EN 10021, *General technical delivery conditions for steel products*

EN 10160, *Ultrasonic testing of steel flat product of thickness equal or greater than 6 mm (reflection method)*

EN 10306:2001, *Iron and steel — Ultrasonic testing of H beams with parallel flanges and IPE beams*

3 Terms and definitions

No terms and definitions are listed in this document.

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>

4 Designation

Products with requirements for improved deformation properties perpendicular to the surface of the product shall be designated as follows:

- the designation of the steel (according to the relevant product standard);
- the number of this document (EN 10164);
- the designation of the quality class (according to [Table 1](#)).

EXAMPLE Steel according to EN 10025-3 of the grade S355N (1.0545) with requirements for improved deformation properties perpendicular to the surface of the product according to EN 10164 of class Z25:

Steel EN 10025-3- S355N + EN 10164 - Z25

or

1) $1 \text{ MPa} = 1 \text{ N/mm}^2$