



SLOVENSKI STANDARD

SIST EN 10164:1998

01-avgust-1998

Jekleni izdelki z izboljšanimi sposobnostmi deformacije pravokotno na površino - Tehnični dobavni pogoji

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

Stahlerzeugnisse mit verbesserten Verformungseigenschaften senkrecht zur Erzeugnisoberfläche - Technische Lieferbedingungen

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

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Ta slovenski standard je istoveten z: EN 10164:1993

ICS:

77.140.01	Železni in jekleni izdelki na splošno	Iron and steel products in general
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EUROPEAN STANDARD

EN 10164:1993

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 1993

UDC 669.14.018.29:620.1

Descriptors: Iron- and steel products, hot rolled products, metal plates, wide flats, strips, metal sections, steels, quality classes, tests, delivery

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

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This European Standard was approved by CEN on 1993-06-20. 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 Central Secretariat or to any CEN member.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

This draft European Standard has been drawn up by ECISS/TC 10 "Structural steel -- qualities" whose Secretariat is held by NNI.

This European standard replaces:
EURONORM 164 (1983) Steel flat products with specified
through thickness properties --
Technical conditions of delivery

The paragraphs concerning flat products of this document were originally drawn up as EURONORM 164 under the European Coal and Steel Community. With the formation of ECISS and the establishment of the ECISS work programme TC 10 was asked to prepare this document for eventual publication as a European Standard.

ECISS/TC 10 met 26 and 27 September, 1991 in Brussels and agreed on the text for circulation for formal vote within CEN. The following countries were represented in that meeting: Austria, Belgium, Denmark, Finland, France, Germany, Italy, Luxembourg, the Netherlands, Sweden and United Kingdom. (standards.iteh.ai)

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 December 1993, and conflicting national standards shall be withdrawn at the latest by December 1993.

This standard was approved in accordance with the CEN/CENELEC Internal Regulations, following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Introduction

Steel plates, strip, wide flats and sections 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 steelmaking procedures.

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

There is no direct relationship between these values and the integrity of structures, because the risk of lamellar tearing is also basically influenced by the type of structure, weld design and welding procedure. The minimum values for reduction of area in this standard cannot therefore by themselves be regarded as ensuring safety against occurrence of lamellar tearing. 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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Scope

This European Standard specifies through thickness properties and associated test methods for steel plates, strip, wide flats and sections.

This European Standard may be applied as a supplement to all product standards for plate, strip, wide flats and sections of killed steels, except stainless steels. It covers products having a thickness between 15 mm and 250 mm inclusive of steels with a specified minimum upper yield strength R_{eH} or proof strength $R_{p0.2} \leq 500$ N/mm² for which improved through thickness properties are required.

The application of this European Standard to other product thicknesses and other steel types shall be the subject of agreement at the time of the enquiry and order.

Option 1.

2

Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard

only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 10002-1	Metallic materials -- Tensile testing -- Part 1: Method of test (at ambient temperature)
EN 10021	General technical delivery requirements for steel and iron products
EURONORM 160 (1985) ¹⁾	Ultrasonic testing of steel plate of thickness ≥ 6 mm (reflection method)
EURONORM 186 (1987) ¹⁾	Ultrasonic testing of broad flanged beams with parallel flanges and IPE beams.

3 Information to be supplied by the purchaser

3.1 General

The following information shall be supplied by the purchaser at the time of enquiry and order:

- a) the designation of the steel (according to the relevant product standard);
- b) the designation of the quality class (see table 1).

Where no specific choice is made by the purchaser the supplier shall refer back to the purchaser.

3.2 Options

A number of options is specified in clause 8. In the event that the purchaser does not indicate his wish to implement any of these options, the supplier shall supply in accordance with the basic specification.

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);

1) Until these EURONORMS are transformed into European Standards, they can either be implemented or reference made to the corresponding national standards, the list of which is given in Annex A to this European Standard.

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- the number of this European Standard (EN 10164);
- the designation of the quality class (according to table 1).

Example: steel according to EN 10113-2 of the grade S355N with requirements for improved deformation properties perpendicular to the surface of the product according to EN 10164 of class Z25,

Steel EN 10113-2 S355N + EN 10164 - Z25.

5 Requirements

5.1 Reduction of area

Table 1 gives minimum values for reduction of area for the specified quality classes.

NOTE: Reduction of area (Z) is defined in EN 10002-1:1990 as:

$$Z = \frac{S_0 - S_u}{S_0} \times 100$$

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where:

S_0 is the original cross-sectional area of the parallel length;
 S_u is the minimum cross-sectional area after fracture.

The purchaser shall select one of the quality classes at the time of enquiry and order.

For plates, strip and wide flats the minimum values for reduction of area apply to the whole product.

For sections the minimum values for reduction of area apply to either the flange or the web depending on where the samples are taken (see 6.2.3).

Table 1 -- Quality classes and minimum values for the reduction of area

Quality class	Reduction of area in %	
	Minimum average value of three tests	Minimum individual value
Z15	15	10
Z25	25	15
Z35	35	25

5.2 Ultrasonic testing

Flat products shall be submitted to an ultrasonic examination in accordance with the requirements of EURONORM 160-85. Sections shall be submitted to an ultrasonic examination in accordance with the requirements of EURONORM 186-87.

Unless otherwise agreed at the time of the enquiry and order plates and wide flats shall meet the requirements of class A in accordance with EURONORM 160-85, sections shall meet the requirements of class 22 in accordance with EURONORM 186-87 table 2.
Option 2.

NOTE: Application of the normal ultrasonic techniques does not give information about the susceptibility to lamellar tearing.

6

Testing

6.1

Test units

Each consignment shall be subdivided into test units in accordance with 6.1.1 to 6.1.3.

6.1.1

Sheet, plate and coil

The test units for sheet, plate and coil of the quality classes Z15, Z25 and Z35 based on the sulphur content of the ladle analysis are given in table 2.

Table 2 -- Test units for sheet, plate and coil

Quality class	Test unit for		
	S > 0,005 % ¹⁾		S ≤ 0,005 % ¹⁾
	Parent plate or coil ²⁾	max. 40 t ³⁾	cast ⁴⁾
Z15	if agreed	x ⁵⁾	x
Z25	x	-	x ⁵⁾
Z35	x	-	x ⁵⁾

1) Ladle analysis.
2) Coil applies to wide strip, narrow strip and slit strip.
3) Or part thereof of products of the same cast with the same heat treatment.
4) Products with the same heat treatment.
5) Unless otherwise agreed at the time of enquiry and order.
Option 3.