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Technical delivery conditions for the surface condition of hot rolled steel plate, wide flats and sections

Plate and wide flats

DIN EN 10163 Part 2

Lieferbedingungen für die Oberflächenbeschaffenheit von warmgewalzten Stahlerzeugnissen (Blech, Breitflachstahl und Profile); Blech und Breitflachstahl

European Standard EN 10 163-2 : 1991 has the status of a DIN Standard.

A comma is used as the decimal marker.

National foreword

This standard has been prepared by ECISS/TC 10.

The responsible German body involved in the preparation of this standard was the *Normenausschuß Eisen und Stahl* (Steel and Iron Standards Committee), Technical Committee 20/1 *Maßnormen für warmgewalzte Flacherzeugnisse*.

This standard is the first German standard to deal with technical delivery conditions for the surface condition of hot rolled steel plate and wide flats, previously dealt with in the *Stahl-Eisen-Lieferbedingung* (Technical delivery condition for iron and steel) 071 issued by the *Verein Deutscher Eisenhüttenleute* (German Association of Metallurgical Engineers). This *Stahl-Eisen-Lieferbedingung* differs from the European Standard in that it does not permit a lower material thickness due to grinding than the minimum value specified.

The present standard specifies requirements regarding the surface condition, i.e. deals with the type, permissible depth and size of imperfections and discontinuities as well as grinding allowances (cf. clauses 4 and 5), and establishes surface quality classes (cf. clause 3).

The DIN Standards corresponding to the European Standards/EURONORMs referred to in clause 2 of the EN are as follows:

European Standard/EURONORM	DIN Standard
EN 10 029	DIN EN 10 029 (at present at the stage of draft)
EN 10 051	DIN EN 10 051
EURONORM 91	DIN 59 200

Standards and other document referred to

(and not included in **Normative references**)

DIN EN 10 029	(at present at the stage of draft) Hot rolled plate 3 mm thick or above; tolerances on dimensions, shape and mass
DIN EN 10 051	(at present at the stage of draft) Continuously hot rolled uncoated plate, sheet and strip of non-alloy and alloy steel; tolerances on dimensions and shape
DIN 59 200	Hot rolled wide steel flats; dimensions, mass and limit deviations

Stahl-Eisen-Lieferbedingung 071 *Oberflächenbeschaffenheit von warmgewalztem Grob- und Mittelblech sowie Breitflachstahl* (Surface condition of hot rolled steel sheet and plate)

Other relevant standards

DIN EN 10 163 Part 1	Technical delivery conditions for the surface condition of hot rolled steel plate, wide flats and sections; general requirements
DIN EN 10 163 Part 3	Technical delivery conditions for the surface condition of hot rolled steel plate, wide flats and sections; sections

International Patent Classification

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Continued overleaf.

EN comprises 4 pages.

Editor's note

*This standard reproduces the official text of the English version of EN 10 163-2 as issued by CEN. In its preparation for publication as DIN EN 10 163 Part 2 (English version), certain points have been noted which we consider to be in need of correction. These have been marked *). The suggested amendments are given below and will be forwarded to the responsible CEN Secretariat for its consideration.*

In presentation, orthography, punctuation and hyphenation, the aim has been to implement the PNE Rules consistently. Obvious errors (e.g. redundancies and omissions) have been rectified without further reference.

Suggested amendments

1 *In the title and text of the standard, 'steel plates' should preferably read 'steel plate' in those cases where reference is made to the semi-finished product.*

2 *The first paragraph of subclauses 4.2.1.1 should preferably read 'Owing to the nature of the manufacturing process, the occurrence of discontinuities other than cracks, shell and seams (see 4.2.2.3) cannot be avoided. All such discontinuities are to be deemed acceptable provided that they do not exceed the depth specified in table 1.'*

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 10163-2

August 1991

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Descriptors: Iron and steel products, hot rolled products, steels, delivery condition, surface condition, quality classes.

English version

Delivery requirements for surface condition of hot rolled steel plates+), wide flats and sections

Part 2: Plate and wide flats

Conditions de livraison relatives à l'état de surface des tôles, larges plats et profilés en acier laminés à chaud. Partie 2: Tôles et larges plats

Lieferbedingungen für die Oberflächenbeschaffenheit von warmgewalzten Stahlerzeugnissen (Blech, Breitflachstahl und Profile). Teil 2: Blech und Breitflachstahl

This European Standard was approved by CEN on 1991-08-21. 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.

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 Central Secretariat has the same status as the official versions.

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CEN

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

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Contents

Foreword

This draft European Standard has been drawn up by ECISS/TC 10 'Structural steel; quality standards' whose Secretariat is held by NNI.

Parts 1 and 2 of this European Standard replace: EURONORM 163-83 Delivery conditions for surface finish of hot rolled plates and wide flats.

Parts 1 and 2 of this document were originally drawn up as EURONORM 163 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 3 and 4 May, 1990 in Brussels and agreed on the text for publication as a European Standard. The following countries were represented at that meeting: Austria, Belgium, Denmark, Finland, France, Germany, Italy, Luxembourg, Netherlands, Sweden and United Kingdom.

This European Standard EN 10 163-2 was approved by CEN on 1991-04-16.

According to the CEN/CENELEC Internal Regulations, the 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.

1 Scope

This Part 2, in addition to Part 1, specifies the delivery requirements which apply to the surface quality of hot rolled plates*) and wide flats with thicknesses of 3 mm $\leq e \leq$ 250 mm.

NOTE: For plates*) with a thickness >250 mm, special agreements should be made at the time of ordering.

2 Normative references

EN 10 029	Hot rolled plates*) 3 mm thick or above; tolerances on dimensions, shape and mass
EN 10 051	Continuously hot rolled uncoated plate, sheet and strip of non-alloy and alloy steel; tolerances on dimensions and shape
EURONORM 91[1])	Hot rolled wide flats; tolerances on dimensions, shape and mass

3 General

3.1 The surface requirements and repair conditions are subdivided into 2 classes and each class is further subdivided into 3 subclasses.

[1]) Until this EURONORM is transformed into a European Standard, it can either be implemented or reference made to the corresponding national standard, the list of which is given in annex C to Part 1 of this European Standard.

Class A
The surface condition shall comply with the requirements of 4.2 and 5.1.1.

The remaining thickness of the affected area under discontinuities and of repaired ground areas may be less than the minimum thickness as specified in the appropriate tolerance standard.

Class B
The surface condition shall comply with the requirements of 4.3 and 5.1.2.

The remaining thickness of the affected area under discontinuities and of repaired ground areas shall not be less than the minimum thickness as specified in the appropriate tolerance standard.

Subclass 1
Repair by chipping and/or grinding followed by welding is permitted in compliance with 5.2.1.

Subclass 2
Repair by welding is only permitted if agreed at the time of ordering and under agreed conditions (see 5.2.2).

Subclass 3
Repair by welding is not allowed.

The required class and subclass is specified in the appropriate material or product standard. If this is not the case, the class and subclass shall be class A and subclass 1 unless otherwise specified at the time of ordering.

3.2 If the purchaser needs to be sure that all discontinuities visible to the naked eye have been identified, assessed and where necessary repaired before delivery, products should be ordered descaled (see clause 3 of Part 1).

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4 Requirements

4.1 General

Plates*) and wide flats may have surface discontinuities, which may be divided into categories depending on their nature, depth and number, as defined in 4.2 and 4.3.

4.2 Class A

4.2.1 Imperfections

4.2.1.1 Discontinuities others than cracks, shell and seams (see 4.2.2.3) with a depth not exceeding the limits of table 1 are regarded as being inherent of the manufacturing process and are permissible irrespective of their number.

A surface area with a remaining thickness under the discontinuities less than the minimum thickness as specified in EN 10 029, EN 10 051 and EURONORM 91 is permissible, with a maximum of 15 % of the inspected surface.

Table 1. **Maximum permissible depth of imperfections**

Dimensions in mm

Nominal thickness of the product, e	Maximum permissible depth of imperfections
$3 \leq e < 8$	0,2
$8 \leq e < 25$	0,3
$25 \leq e < 40$	0,4
$40 \leq e < 80$	0,5
$80 \leq e < 150$	0,6
$150 \leq e \leq 250$	0,9

4.2.1.2 Discontinuities other than cracks, shell and seams (see 4.2.2.3) with a depth exceeding the limits of table 1 but not exceeding the limits of table 2 and of which the sum of the affected areas does not exceed 5 % of the inspected surface, may be left unrepaired.

A surface area with a remaining thickness under the discontinuities less than the minimum thickness as specified in EN 10 029, EN 10 051 and EURONORM 91 is permissible with a maximum of 2 % of the inspected surface.

Table 2. **Maximum permissible depth of discontinuities**

Dimensions in mm

Nominal thickness of the product, e	Maximum permissible depth of discontinuities
$3 \leq e < 8$	0,4
$8 \leq e < 25$	0,5
$25 \leq e < 40$	0,6
$40 \leq e < 80$	0,8
$80 \leq e < 150$	0,9
$150 \leq e \leq 250$	1,2

4.2.2 Defects

4.2.2.1 Discontinuities with a depth not exceeding the limits of table 2, but with an affected surface area of more than 5 % of the inspected surface shall be repaired.

4.2.2.2 Discontinuities with a depth exceeding the limits of table 2 shall be repaired irrespective of their number.

4.2.2.3 Discontinuities such as cracks, shell and seams which are in general deep and sharp, and therefore impair the use of the products, shall always be repaired irrespective of their depth and number.

4.3 Class B

The requirements of 4.2.1 and 4.2.2 apply except that the remaining thickness under the discontinuities and repair ground areas shall not be less than the minimum permissible thickness as specified in the appropriate European Standards or EURONORMs specifying tolerances.

5 Repair procedures

5.1 Grinding

The producer shall be allowed to repair the entire surface by grinding to the minimum thickness specified in the appropriate European Standards or EURONORMs specifying the dimensional requirements.

Grinding of defects shall be carried out subject to the following conditions.

5.1.1 Class A

5.1.1.1 The maximum permissible depth of ground areas is given in table 3.

Table 3. **Grinding allowances for plates and wide flats**

Dimensions in mm

Nominal thickness of the product, e	Permitted grinding depth allowance below the minimum thickness as specified in EN 10 029, EN 10 051 and EU 91
$3 \leq e < 8$	0,3
$8 \leq e < 15$	0,4
$15 \leq e < 25$	0,5
$25 \leq e < 40$	0,8
$40 \leq e < 60$	1,0
$60 \leq e < 80$	1,5
$80 \leq e \leq 250$	2,0

5.1.1.2 For ground areas with a thickness under the minimum permissible thickness, as specified in the European Standards or EURONORMs specifying tolerances, the sum of all ground areas below the minimum permissible thickness of one side of the product shall not exceed 2 % of the surface area under inspection. For products of surface area greater than 12,5 m^2, the size of a single ground area below the minimum permissible thickness shall not exceed 0,25 m^2.

5.1.1.3 For the remaining thickness of two ground areas lying opposite to each other on both sides of the product, the requirements of 5.1.1.1 apply.

5.1.2 Class B

The remaining thickness of the repaired ground area shall not be under the minimum permissible thickness as specified in the appropriate European Standards or EURONORMs specifying tolerances.

5.2 Welding

The following conditions apply for the repair by welding of defects which cannot be repaired by grinding as stated under 5.1.

5.2.1 Subclass 1

A single welded area shall not exceed 0,125 m^2 and the sum of the welded areas shall not exceed 0,125 m^2 or 2 % of the surface area under inspection, whichever is the greater.

Ground and welded areas which are separated by a distance less than their average width shall be treated as a single area for the purpose of determining the limiting area.

5.2.2 Subclass 2

Repair by welding is only allowed if agreed at the time of ordering. In this case, requirements different from 5.2.1 may be specified.

5.2.3 Subclass 3

Repair by welding is not allowed.

Annex A

(informative)

Classes and subclasses for surface conditions with their respective requirements

Table 4. **Classes and subclasses for surface conditions with their respective requirements**

		Remaining thickness of repaired ground area in compliance with 5.1.1		
		Repair chipping/grinding followed by welding	Repair welding by agreement	Repair welding not allowed
Class A	Subclass 1	×		
	Subclass 2		×	
	Subclass 3			×

		Remaining thickness of repaired ground area not under tolerance standard in compliance with 5.1.2		
		Repair chipping/grinding followed by welding	Repair welding by agreement	Repair welding not allowed
Class B	Subclass 1	×		
	Subclass 2		×	
	Subclass 3			×