

Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections —

Part 2: Plate and wide flats

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National foreword

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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

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Contents

	Page
Foreword.....	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	4
4 General.....	4
5 Classification.....	4
6 Requirements	5
6.1 Depth and affected area of discontinuities	5
6.2 Repair requirements	5
6.2.1 Class A.....	5
6.2.2 Class B.....	6
6.3 Repair procedures	6
6.3.1 General.....	6
6.3.2 Grinding	7
6.3.3 Welding.....	8
Annex A (informative) Classes and subclasses for surface conditions with their respective requirements	10

Foreword

This document (EN 10163-2:2004) has been prepared by Technical Committee ECISS/TC 10 “Structural steels – Grades and qualities”, the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by June 2005, and conflicting national standards shall be withdrawn at the latest by June 2005.

This document supersedes EN 10163-2:1991, *Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections – Part 2: Plates and wide flats*.

This series of standards consists of the following parts, under the general title *Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections*:

- *Part 1: General requirements*
- *Part 3: Sections*.

During the 5 year review of EN 10163-2:1991 the members of ECISS/TC 10 agreed to revise EN 10163-2:1991. It was asked to bring the text in line with ECISS DOCS N 809 “Iron and steel standardization – Model for a product standard”. Also the range of dimensions from EN 10025-2, which is increased from 250 mm to 400 mm is incorporated in this new edition.

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

1 Scope

In addition to EN 10163-1 this document specifies the delivery requirements which apply to the surface condition of hot-rolled plates and surface condition of the faces of wide flats with thicknesses of $3 \text{ mm} \leq t \leq 400 \text{ mm}$.

NOTE For plates with a thickness $> 400 \text{ mm}$ special agreements should be made at the time of the order.

2 Normative references

The following referenced documents are indispensable for the application 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 10029, *Hot rolled steel plates 3 mm thick or above - Tolerances on dimensions, shape and mass.*

EN 10051, *Continuously hot-rolled uncoated plate, sheet and strip of non-alloy and alloy steels - Tolerances on dimensions and shape.*

EN 10163-1:2004, *Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections – Part 1: General requirements.*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 imperfections for flat products

surface discontinuities other than cracks, shell and seams with a depth and/or area equal to or less than a specified limiting value

3.2 defects for flat products

surface discontinuities with a depth and/or area greater than a specified limiting value and all cracks, shell and seams irrespective of their depth or/and area

4 General

In addition to the conditions stated in EN 10163-1, it applies that 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 4 of EN 10163-1:2004).

5 Classification

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

Class A The surface condition shall comply with the requirements of 6.2.1 and 6.3.2.2. 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 6.2.2 and 6.3.2.3. 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 6.3.3.2.

Subclass 2 Repair by welding is only permitted if agreed at the time of the order and under agreed conditions (see 6.3.3.3).

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 the order.

6 Requirements

6.1 Depth and affected area of discontinuities

The requirements of EN 10163-1 apply.

6.2 Repair requirements

6.2.1 Class A

6.2.1.1 Imperfections

6.2.1.1.1 Discontinuities other than cracks, shell and seams (see 6.2.1.2.3) 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 discontinuities within the limits of Table 1 but with a remaining thickness under the discontinuities less than the minimum thickness as specified in EN 10029 and EN 10051 is permissible with a maximum of 15 % of the inspected surface.

Table 1 — Maximum permissible depth of imperfections

Dimensions in millimetres

Nominal thickness of the product t	Maximum permissible depth of imperfections
$3 \leq t < 8$	0,2
$8 \leq t < 25$	0,3
$25 \leq t < 40$	0,4
$40 \leq t < 80$	0,5
$80 \leq t < 250$	0,7
$250 \leq t \leq 400$	1,3

6.2.1.1.2 Discontinuities other than cracks, shell and seams (see 6.2.1.2.3) 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.

In this case is a surface area with a remaining thickness under the discontinuities less than the minimum thickness as specified in EN 10029 and EN 10051 permissible with a maximum of 2 % of the inspected surface.

Table 2 — Maximum permissible depth of discontinuities
Dimensions in millimetres

Nominal thickness of the product t	Maximum permissible depth of discontinuities
$3 \leq t < 8$	0,4
$8 \leq t < 25$	0,5
$25 \leq t < 40$	0,6
$40 \leq t < 80$	0,8
$80 \leq t < 150$	0,9
$150 \leq t < 250$	1,2
$250 \leq t \leq 400$	1,5

6.2.1.2 Defects

6.2.1.2.1 Discontinuities with a depth exceeding the limits of Table 1 but not exceeding the limits of Table 2, but with an affected surface area of more than 5 % of the inspected surface shall be repaired.

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

6.2.1.2.3 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.

6.2.2 Class B

The requirements of 6.2.1.1 and 6.2.1.2 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 specifying tolerances.

6.3 Repair procedures

6.3.1 General

In addition to the requirements of EN 10163-1 the following apply.

6.3.2 Grinding

6.3.2.1 Introduction

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

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

6.3.2.2 Class A

6.3.2.2.1 The maximum permissible depth of ground areas is given in Table 3 and 4 respectively.

Table 3 — Maximum permissible depth of ground areas with a maximum of 15 % of the inspected area
Dimensions in millimetres

Nominal thickness of the product t	Permitted grinding depth allowances below the minimum thickness as specified in EN 10029 and EN 10051
$3 \leq t < 8$	0,3
$8 \leq t < 15$	0,4
$15 \leq t < 25$	0,5
$25 \leq t < 40$	0,6
$40 \leq t < 60$	0,7
$60 \leq t < 80$	0,8
$80 \leq t < 150$	1,0
$150 \leq t < 250$	1,2
$250 \leq t \leq 400$	1,4

Table 4 — Maximum permissible depth of ground areas not exceeding 2 % of the inspected area
Dimensions in millimetres

Nominal thickness of the product t	Permitted grinding depth allowances below the minimum thickness as specified in EN 10029 and EN 10051
$3 \leq t < 8$	0,4
$8 \leq t < 15$	0,5
$15 \leq t < 25$	0,7
$25 \leq t < 40$	0,9
$40 \leq t < 60$	1,1
$60 \leq t < 80$	1,3
$80 \leq t < 150$	1,6
$150 \leq t < 250$	1,9
$250 \leq t \leq 400$	2,2

6.3.2.2.2 When the depth of the ground area is less than indicated in Table 3, a surface area with a remaining thickness under the ground area less than the minimum thickness as specified in EN 10029 and EN 10051 is permissible with a maximum of 15 % of the inspected surface.

6.3.2.2.3 When the depth of the ground area exceeds the limits given in Table 3 but is less than indicated in Table 4, the sum of all ground areas below the minimum permissible thickness of one side of the product shall not exceed 2 % of the inspected surface area. For products of surface area greater than 12,5 m² the size of a single ground area below the minimum permissible thickness shall not exceed 0,25 m².

6.3.2.2.4 For the remaining thickness of two ground areas lying opposite to each other on both sides of the product the requirements of Table 4 apply.

6.3.2.3 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 specifying tolerances.

6.3.3 Welding

6.3.3.1 General

The following conditions apply for the repair by welding of defects which cannot be repaired by grinding as stated under 6.3.2.

6.3.3.2 Subclass 1

A single welded area shall not exceed 0,125 m² and the sum of the welded areas shall not exceed 0,125 m² 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.

6.3.3.3 Subclass 2

Repair by welding is only allowed if agreed at the time of the order. In this case requirements different from 6.3.3.2 can be specified.

6.3.3.4 Subclass 3

Repair by welding is not allowed.

Annex A (informative)

Classes and subclasses for surface conditions with their respective requirements

In Table A.1 the classes and subclasses for surface conditions are given with their respective requirements.

Table A.1 — Classes and subclasses for surface conditions with their respective requirements

		Remaining thickness of repaired ground area in compliance with 6.3.2.2		
		Repair chipping/grinding followed by welding	Repair welding by agreement	Repair welding not allowed
Class A	Subclass 1	x		
	Subclass 2		x	
	Subclass 3			x

		Remaining thickness of repaired ground area <u>not</u> under tolerance standard in compliance with 6.3.2.3		
		Repair chipping/grinding followed by welding	Repair welding by agreement	Repair welding not allowed
Class B	Subclass 1	x		
	Subclass 2		x	
	Subclass 3			x

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