UDC 669.14-122.4-41:621.713

February 1992

Continuously hot rolled uncoated unalloyed and alloy steel plate, sheet and strip

Dimensional and geometrical tolerances

English version of DIN EN 10 051

DIN

EN 10 051

Kontinuierlich warmgewalztes Blech und Band ohne Überzug aus legierten und unlegierten Stählen; Grenzabmaße und Formtoleranzen

Supersedes part of DIN 1016, June 1987 edition.

European Standard EN 10 051:1991 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 12.

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*.

Since this standard specifies dimensional and geometrical tolerances for wide flats with a width from 600 to 2200 mm for the steel grades listed in table 1, it supersedes only part of DIN 1016, which also covers products less than 600 mm in width. Such products will be dealt with in another European Standard, based on EURONORM 48-84, which is currently being prepared by ECISS/TC 13.

It should be noted that the position of Germany, which sought to specify closer tolerances on thickness for sheet/plate less than 600 mm wide did not find substantial support in the responsible committee. Thus, for all widths of 1200 mm or less, the same tolerances now apply (cf. table 2). For this reason, Germany did not vote in favour of EN 10 051 in the present form.

On the other hand, the committee has accepted the German proposal not to grade the thickness tolerances for steel exhibiting a high deformation resistance at elevated temperatures on the basis of the minimum yield strength at ambient temperature but according to the deformation resistance (cf. tables 3 and A.1 to A.3).

Continued on pages 2 and 3.

EN comprises 15 pages.

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

European Standard/EURONORM	DIN Standard
EN 10 020	DIN EN 10 020
EN 10 025	DIN EN 10 025
EN 10 028-1	DIN 17 155 Part 1*)
EN 10 028-2	DIN 17 155 Part 2*)
EN 10 028-3	DIN 17 155 Part 3*)
EN 10 079	DIN EN 10 079
EN 10 083-1	DIN EN 10 083 Part 1
EN 10 083-2	DIN EN 10 083 Part 2
EN 10 113-1	DIN EN 10 113 Part 1*)
EN 10 113-2	DIN EN 10 113 Part 2*)
EN 10 113-3	DIN EN 10 113 Part 3*)
EN 10 207	DIN EN 10 207
prEN 10 155	DIN EN 10 155*)
prEN 10 208-2	DIN EN 10 208 Part 2*)
EURONORM 48-84	DIN 1016
EURONORM 84-70	DIN 17 210
EURONORM 88-2-86	DIN 17 440
EURONORM 88-3-86	DIN 17 440
EURONORM 96-79	DIN 17 350
EURONORM 111	DIN 1614 Parts 1 and 2
EURONORM 149-80	cf. Stahl-Eisen-Werkstoffblatt (SEW) (Iron and steel materials sheet) 092[1])

Standards referred to

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

DIN 1016	Hot rolled steel sheet and strip; limit deviations, form and mass tolerances
DIN 1614 Part 1	Hot rolled steel sheet and strip; technical delivery conditions for mild unalloyed steel for cold reducing
DIN 1614 Part 2	Hot rolled steel sheet and strip; technical delivery conditions for mild unalloyed steel for immediate cold forming
DIN 17 102 Part 10	Weldable fine grain normalized structural steel plate and strip for pressure purposes
DIN 17 155 Part 1	Steel plate and strip for pressure purposes; general requirements
DIN 17 155 Part 2	Steel plate and strip for pressure purposes; unalloyed and alloy steel with elevated temperature properties
DIN 17 210	Case hardening steel; technical delivery conditions
DIN 17 350	Tool steel; technical delivery conditions
DIN 17 440	Stainless steel; technical delivery conditions for sheet, hot rolled strip, wire rod, drawn wire, steel bars, forgings and semi-finished products
DIN EN 10 020	Definition and classification of steel
DIN EN 10 025	Hot rolled unalloyed structural steel products; technical delivery conditions
DIN EN 10 079	Definition and classification of steel products by shape and dimensions
DIN EN 10 083 Part 1	Quenched and tempered steels; technical delivery conditions for special steels
DIN EN 10 083 Part 2	Quenched and tempered steels; technical delivery conditions for unalloyed quality steels
DIN EN 10 113 Part 1*)	Hot rolled weldable fine grain structural steel products; technical delivery conditions
DIN EN 10 113 Part 2*)	Hot rolled weldable fine grain structural steel products; technical delivery conditions for normalized steel
DIN EN 10 113 Part 3*)	Hot rolled weldable fine grain structural steel products; technical delivery conditions for thermo-mechanically rolled steel
DIN EN 10 155*)	Structural steel with improved atmospheric corrosion resistance; technical delivery conditions
DIN EN 10 207	Steel plate, strip and bars for the manufacture of simple pressure vessels
DIN EN 10 208 Part 2*)	Steel pipes for use with combustible fluids; requirement class B pipes; technical delivery conditions

Stahl-Eisen-Werkstoffblatt 092 *Warmgewalzte Feinkornstähle zum Kaltumformen; Gütevorschriften* (Hot rolled fine grain structural steel for cold forming; quality specifications)

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*) At present at the stage of draft.

[1]) Obtainable from *Verlag Stahleisen mbH*, Sohnstraße 65, D-4000 Düsseldorf.

Previous editions

DIN 1541 Parts 1 and 2: 05.32; DIN 1016: 10.41x, 01.59, 11.72, 06.87.

Amendments

In comparison with DIN 1016, June 1987 edition, the following amendments have been made.

a) The scope of the standard has been extended to cover plate and strip up to 25 mm nominal thickness and 2200 mm nominal width.

b) Hot rolled strip less than 600 mm in width is no longer given separate treatment (cf. National foreword).

c) The tolerances on width of products with trimmed edges have been amended (cf. table 5).

d) Special tolerances on flatness have been specified (cf. table 6) and tolerances on flatness for steel exibiting a high deformation resistance at elevated temperatures have been introduced.

International Patent Classification

B 21 B 1/00
C 22 C 38/04
C 22 C 38/22
B 21 B 1/02
G 01 B 21/22
G 01 B 21/30

Editor's note

This standard reproduces the official text of the English version of EN 10 051 as issued by CEN. In its preparation for publication as DIN EN 10 051 (English version), one point has been noted which we consider to be in need of correction. This has been marked +). The suggested amendment is 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 amendment

Re clause 7.7

To avoid possible misunderstandings arising from the non-existence of the term 'superimposement', we suggest the following amendment which is also more consistent with the German version:

'Alternative order specification

By agreement at the time of ordering, the requirements regarding tolerance on out-of-squareness and edge camber may be replaced by the requirement that each sheet supplied contain a rectangle corresponding in terms of length and width to the dimensions as ordered.'

Item 5 in clause 10 is to be modified accordingly.

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 10 051

December 1991

UDC 669.14-122.4-41 : 621.753.14

Descriptors: Iron and steel products, hot rolled products, metal plate, wide strip, alloy steel, unalloyed steel, dimensional tolerances, form tolerances.

English version

Continuously hot rolled uncoated plate, sheet and strip of non-alloy and alloy steels

Tolerances on dimensions and shape

Tôles, larges bandes et larges bandes refendues laminées à chaud en continu en aciers alliés et non alliés; tolérances sur les dimensions et la forme

Kontinuierlich warmgewalztes Blech und Band ohne Überzug aus legierten und unlegierten Stählen; Grenzabmaße und Formtoleranzen

This European Standard was approved by CEN on 1991-12-20. 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.

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.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization

Comité Européen de Normalisation

Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

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Contents

Foreword

This European Standard has been drawn up by ECISS/TC 12 'Structural steel and steels for pressure purposes, flat products; dimensions and tolerances', whose Secretariat is held by NNI.

This document was originally drawn up as a EURONORM under the European Coal and Steel Community. With the formation of ECISS and the establishment of the ECISS work programme, TC 12 was asked to prepare this document for eventual publication as a European Standard.

This European Standard replaces EURONORMs:

EU 51-82 Continuously hot-rolled non coated sheet/plate and strip of non-alloyed and alloyed steel with specified minimum yield strength; tolerances on dimensions and shape

EU 112-81 Continuously hot-rolled non-coated, non-alloy mild steel sheet/plate and strip for cold forming and bending; tolerances on dimensions and shape

ECISS/TC 12 met in September 1990 in Brussels and agreed on the text for circulation for Formal Vote within CEN. The following countries were represented at that meeting: Austria, Belgium, Finland, France, Germany, Italy, Luxembourg and United Kingdom.

This European Standard was approved by CEN on 1991-12-20.

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.

Table 1: Field of application

Product	Thickness mm	Steel grades according to
Sheet/plate, wide strip (minimum width 600 mm), strip <600 mm wide, slit from wide strip	≤ 25	EURONORMs 84, 88-2, 88-3, 96, 111, 120, 137, 149-2, 149-3, 156, as well as EN 10 025, EN 10 083-1, EN 10 083-2, prEN 10 028, prEN 10 113-2, prEN 10 113-3, prEN 10 155, prEN 10 207 and prEN 10 208-2

1 Scope

This European Standard applies to continuously hot rolled uncoated flat products with a maximum width of 2 200 mm of non-alloy and alloy steels, including stainless steels, in accordance with table 1.

This European Standard also applies to hot rolled strip for cold rolling.

This European Standard does not apply to hot rolled strip rolled in widths < 600 mm (see EURONORM 48).

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 10 020	Definition and classification of grades of steel
EN 10 025	Hot rolled products of non-alloy structural steels; technical delivery conditions
EN 10 079	Definitions of steel products
EN 10 083-1	Quenched and tempered steels; technical delivery conditions for special steels
EN 10 083-2	Quenched and tempered steels; technical delivery conditions for unalloyed quality steels
EN 10 207	Steels for simple pressure vessels; technical delivery requirements for plates, strips and bars
prEN 10 028	Flat products made of steels for pressure purposes
prEN 10 113	Hot rolled products in weldable fine grain structural steels
prEN 10 155	Structural steels with improved atmospheric corrosion resistance; technical delivery conditions
prEN 10 208-2	Steel pipes for pipelines for combustible fluids; technical delivery conditions. Part 2: Pipes of requirement class B
EURONORM 48-84[1])	Hot rolled narrow steel strip; tolerances on dimensions and shape
EURONORM 84-70[1])	Case hardening steels; quality requirements
EURONORM 88-2-86[1])	Stainless steels; technical delivery conditions for sheet/plate and strip for general purposes
EURONORM 88-3-86[1])	Stainless steels; technical delivery conditions for sheet/plate and strip for boilers and pressure vessels
EURONORM 96-79[1])	Tool steels; quality requirements
EURONORM 111-77[1])	Continuously hot rolled non-coated mild unalloyed steel sheet and strip for cold forming; quality standard
EURONORM 120-83[1])	Steel sheet and strip for welded gas cylinders
EURONORM 137-83[1])	Plates and wide flats made of weldable fine-grain structural steels in the quenched and tempered conditions; technical delivery conditions; general requirements
EURONORM 149-80[1])	Flat products in high yield strength steels for cold forming; wide flats, sheet/plate, wide and narrow strip
EURONORM 156-80[1])	Steels for shipbuilding; normal and high-strength qualities

3 Definitions

For the purpose of this European Standard, the following definitions apply:

non-alloy and alloy steels: see EN 10 020.

wide strip and sheet/plate: see EN 10 079.

4 Information to be supplied by the purchaser

4.1 General

The following information shall be supplied by the purchaser at the time of ordering:

a) description of the product (strip, sheet/plate);

b) number of this European Standard (EN 10 051);

c) nominal thickness and width, in mm;

d) the letter GK if strip and sheet/plate with trimmed edges is ordered (see 6.2);

Option 1.

[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 B of this European Standard.

e) nominal length, in mm (for sheet and plate);

f) width tolerances for products with thickness >10 mm (see 7.3);

g) tolerances on flatness for products of catergory D (see table 7);

h) flatness requirements for wide strip and strip <600 mm wide slit from strip (see 8.4);

i) edge camber requirements for strip < 600 mm wide slit from wide strip (see 8.5).

Where no specific choice is made by the purchaser concerning points f, g, h and i, the supplier shall refer back to the purchaser.

4.2 Options

A number of options are specified in clause 10. 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 (see 6.2).

5 Designation

The designation of products in accordance with 4.1 shall also include the exact designation of the ordered steel grade.

Examples of designation:

a) Sheet according to this European Standard with a nominal thickness of 2,0 mm, a nominal width of 1 200 mm, with trimmed edges (GK), a nominal length of 2 500 mm, of 34 Cr 4 steel as specified in EN 10 083:

Sheet EN 10 051 – 2,0 × 1 200 GK × 2 500
Steel EN 10 083 – 34 Cr 4

b) Strip according to this European Standard with a nominal thickness of 4,5 mm, a nominal width of 1 500 mm, with mill edges, of Fe 360 B steel, as specified in EN 10 025:

Strip EN 10 051 – 4,5 × 1 500
Steel EN 10 025 – Fe 360 B

6 Form of supply

6.1 Sheet/plate and strip shall be supplied with mill edges or with trimmed edges (GK), as agreed at the time of ordering.

6.2 In the absence of information on the form of supply, sheet/plate and strip shall be supplied with mill edges.

6.3 The possibility of delivering coils with welds may be agreed at the time of ordering. The indication of the location of the weld can be agreed at the same time.

Option 2.

7 Tolerances for sheet and plate

7.1 Thickness

7.1.1 The tolerances on thickness for steels with normal deformation resistance at elevated temperatures are given in table 2. These tolerances are indicated as category A.

7.1.2 For steels exhibiting a high deformation resistance at elevated temperatures, the values of table 2 shall be increased by the amounts specified in table 3.

This results in the following categories and increments:

for steels of category B of table 3, the values in table 2 shall be increased by 15 %;

for steels of category C of table 3, the values in table 2 shall be increased by 30 %;

for steels of category D of table 3, the values in table 2 shall be increased by 40 %.

Table 2: Tolerances on thickness for sheet/plate

Dimensions in mm

Nominal thickness	Tolerances for a nominal width of			
	≤ 1 200	> 1 200 ≤ 1 500	> 1 500 ≤ 1 800	> 1 800
≤ 2,00	± 0,17	± 0,19	± 0,21	--
> 2,00 ≤ 2,50	± 0,18	± 0,21	± 0,23	± 0,25
> 2,50 ≤ 3,00	± 0,20	± 0,22	± 0,24	± 0,26
> 3,00 ≤ 4,00	± 0,22	± 0,24	± 0,26	± 0,27
> 4,00 ≤ 5,00	± 0,24	± 0,26	± 0,28	± 0,29
> 5,00 ≤ 6,00	± 0,26	± 0,28	± 0,29	± 0,31
> 6,00 ≤ 8,00	± 0,29	± 0,30	± 0,31	± 0,35
> 8,00 ≤ 10,00	± 0,32	± 0,33	± 0,34	± 0,40
> 10,00 ≤ 12,50	± 0,35	± 0,36	± 0,37	± 0,43
> 12,50 ≤ 15,00	± 0,37	± 0,38	± 0,40	± 0,46
> 15,00 ≤ 25,00	± 0,40	± 0,42	± 0,45	± 0,50

Table 3: Thickness tolerance increments for steels exhibiting a high deformation resistance at elevated temperatures [1] [2]

Category B (increment of 15 %)		Category C (increment of 30 %)		Category D (increment of 40 %)	
Designation	Standardized in	Designation	Standardized in	Designation	Standardized in
Fe 490-2 Fe 590-2 Fe 690-2 Fe 510 C; D1; D2 DD1; DD2 Fe 510 C1 KI; D1 KI; C2 KI; D2 KI; DD2 KI Fe E 355-TM; -TD Fe E 355 KG N; TM Fe E 355 KT N; TM PH 295 PH 355	EN 10 025 EN 10 025 EN 10 025 EN 10 025 prEN 10 155 EU 149-80 prEN 10 113 prEN 10 113 prEN 10 028-2 prEN 10 028-2	360; 360 QT; 360 TM 415; 415 QT; 415 TM Fe E 420 KG TM Fe E 420 KT TM Fe E 420-TM; -TD P 420 N 445; 445 QT; 445 TM Fe E 460 KG N; TM Fe E 460 KT N; TM Fe E 460 V; V KG; V KW; V KT P 460 N	prEN 10 208-2 prEN 10 208-2 prEN 10 113-3 prEN 10 113-3 EU 149-80 prEN 10 028-3 prEN 10 208-2 prEN 10 113 prEN 10 113 EU 137-83 prEN 10 028-3	480 QT; 480 TM Fe E 490-TM; -TD Fe E 500 V; V KG; V KW; V KT 550 QT; 550 TM Fe E 550 V; V KG; V KW; V KT Fe E 560-TM Fe E 620 V; V KG; V KW; V KT Fe E 690 V; V KG; V KW; V KT	prEN 10 208-2 EU 149-80 EU 137-83 prEN 10 208-2 EU 137-83 EU 149-80 Part 2 EU 137-83 EU 137-83
1 C 35 2 C 35 C 36 1 C 45 2 C 45 C 46 1 C 50 2 C 50	EN 10 083-2 EN 10 083-1 EU 86-70 EN 10 083-2 EN 10 083-1 EU 86-70 EN 10 083-2 EN 10 083-1	C 53 1 C 55 2 C 55 1 CS 55 1 C 60 2 C 60 1 CS 60 1 CS 67	EU 86-70 EN 10 083-2 EN 10 083-1 EU 132-79 EN 10 083-2 EN 10 083-1 EU 132-79 EU 132-79	CT 70 1 CS 75 CT 80 2 CS 85 2 CS 100 CT 105 CT 120	EU 96-79 EU 132-79 EU 96-79 EU 132-79 EU 132-79 EU 96-79 EU 96-79
16 Mo 3 28 Mn 6 38 Cr 2 46 Cr 2 34 Cr 4 41 Cr 4 45 Cr 2 38 Cr 4 16 MnCr 5 13 CrMo 4 5 10 CrMo 9 10	prEN 10 028-2 EN 10 083-1 EN 10 083-1 EN 10 083-1 EN 10 083-1 EN 10 083-1 EU 86-70 EU 86-70 EU 84-70 prEN 10 028-2 prEN 10 028-2	25 CrMo 4 34 CrMo 4 41 CrMo 4 42 CrMo 4 14 CrNi 6 20 NiCrMo 2 17 CrNiMo 7	EN 10 083-1 EN 10 083-1 EU 86-70 EN 10 083-1 EU 84-70 EU 84-70 EU 84-70	50 CrMo 4 36 CrNiMo 4 34 CrNiMo 6 30 CrNiMo 8 51 CrV 4 All grades, e.g. 39 CrMoV 13 31 CrMo 12 34 CrAlMo 5 41 CrAlMo 7 All grades, e.g. 50 CrV 4 67 SiCr 5 50 CrV 4	EN 10 083-1 EN 10 083-1 EN 10 083-1 EN 10 083-1 EN 10 083-1 EU 85-70 EU 85-70 EU 85-70 EU 85-70 EU 89-71 EU 132-79 EU 132-79
All ferritic and martensitic stainless steels	EU 88-86 Part 2	All non-Mo-alloyed austenitic stainless steels	EU 88-86 Parts 2 and 3	All Mo-alloyed austenitic stainless steels	EU 88-86 Parts 2 and 3

[1] A list of corresponding national designations and standards is given in annex A, tables A.1–A.3.

[2] In this table, not all steel grades covered by the present European Standards and EURONORMs are mentioned. Other grades the designation of which is based on the same values for the mechanical properties (R_e, R_m, etc.) or for the chemical composition or intermediate grades shall be classified in the same categories as the comparable grades mentioned in this table.

EXAMPLES:
Grade PH 460 N or PL 460 N G1 (according to prEN 10 028-3): category C (as P 460 N).
Grade 2 CS 75 (EU 132-79): category D (as 1 CS 75).
Grade 37 Cr 4 (EN 10 083-1): category B (as 34 Cr 4 and 38 Cr 4).

7.2 Length

The tolerances on length shall be as given in table 4.

Table 4: Tolerances on length Dimensions in mm

Nominal length	Tolerances	
	Lower	Upper
< 2 000	0	+ 10
≥ 2 000 < 8 000	0	+ 0,005 × nominal length
≥ 8 000	0	+ 40

7.3 Width

The tolerances on width for sheet/plate shall be as given in table 5.

Table 5: Tolerances on width for sheet/plate Dimensions in mm

Nominal width	Tolerances			
	Mill edges		Trimmed edges[1])	
	Lower	Upper	Lower	Upper
≤ 1 200	0	+ 20	0	+ 3
> 1 200 ≤ 1 500	0	+ 20	0	+ 5
> 1 500	0	+ 25	0	+ 6

[1]) Tolerances for trimmed edges apply to products with nominal thicknesses ≤ 10 mm, for nominal thickness > 10 mm the upper tolerances shall be agreed at the time of ordering.

7.4 Flatness

7.4.1 For steels with normal deformation resistance at elevated temperatures, the deviation from flatness shall not exceed the tolerances given in table 6.

Closer flatness tolerances shall be agreed at the time of ordering.

Option 3.

Table 6: Tolerances on flatness for steels with normal deformation resistance at elevated temperatures (category A)
Dimensions in mm

Nominal thickness	Nominal width	Tolerances on flatness	
		Standard tolerances	Special tolerances on flatness
≤ 2,00	≤ 1 200	18	9
	> 1 200 ≤ 1 500	20	10
	> 1 500	25	13
> 2,00 ≤ 25	≤ 1 200	15	8
	> 1 200 ≤ 1 500	18	9
	> 1 500	23	12

7.4.2 For steels exhibiting a high deformation resistance at elevated temperatures, the deviation from flatness shall not exceed the tolerances given in table 7.

Closer tolerances for categories B and C may be agreed at the time of ordering.

Option 4.

Table 7: Tolerances on flatness for steels exhibiting a high deformation resistance at elevated temperatures
Dimensions in mm

Nominal thickness	Nominal width	Tolerances on flatness for category[1])		
		B	C	D
≤ 25	≤ 1 200	18	23	To be agreed at the time of ordering.
	> 1 200 ≤ 1 500	23	30	
	> 1 500	28	38	

[1]) Categories B, C and D are defined in 7.1.2 and table 3.

7.5 Out-of-squareness

The out-of-squareness, u, measured in accordance with 9.5, shall not exeed 1 % of the actual width of the sheet/plate.

7.6 Edge camber

The edge camber shall not exceed 0,5 % of the actual length of the sheet/plate for a nominal length < 5 000 mm.

For sheet/plate with a nominal length ≥ 5 000 mm and widths ≥ 600 mm, the edge camber shall not exceed 20 mm for any length of 5 000 mm in the case of sheet/plate with mill edges and 15 mm in the case of sheet with trimmed edges.

7.7 Superimposement of dimensions*)

By agreement at the time of ordering, the tolerances on out-of-squareness and edge camber may be replaced by a requirement that a perfect rectangle formed by the ordered width and length dimensions can be superimposed into the sheets delivered.

Option 5.

8 Tolerances for wide strip and strip slit from wide strip

8.1 General

The specified values for tolerances shall not apply to the uncropped ends of the coil for a total length, l, which is calculated using the formula:

$$l\,(\mathrm{m}) = \frac{90}{\text{nominal thickness (mm)}},$$

provided that the result does not exceed 20 m.

8.2 Thickness

8.2.1 The tolerances on thickness shall be the same as those for sheet/plate (see 7.1).

8.2.2 For hot rolled strip for cold rolling of category A of 7.1.1, maximum values for crown as given in table 8 and permissible thickness differences within one coil as given in table 9 shall apply if agreed at the time of ordering.

Option 6.

NOTE: For coils not slitted in longitudinal direction, the crown should be aimed to be as constant and symmetrical from the middle of the coil as possible.

The thickness (within the coil) shall change gradually; the changes should not be discontinuous.

8.2.3 More severe tolerances on thickness and crown may be agreed at the time of ordering.

Option 7.

Table 8: Maximum values for crown for hot rolled strip for cold rolling for steel grades of categrory A

Dimensions in mm

Nominal width	Permissible crown[1])
≤ 1 200	0 to 0,10
> 1 200 ≤ 1 500	0 to 0,13
> 1 500 ≤ 1 800	0 to 0,16
> 1 800 ≤ 2 200	0 to 0,20

[1]) The values for permissible crown shall be lowered by 20 % for hot rolled strip slit from wide strip meant for cold rolling.

Table 9: Permissible thickness differences within one coil for hot rolled strip for cold rolling

Dimensions in mm

Nominal thickness	Permissible thickness differences for nominal width of strip of		
	≤ 1 200	> 1 200 ≤ 1 500	> 1 500 ≤ 2 200
≥ 0,8 ≤ 2,0	0,20	0,24	0,28
> 2,0 ≤ 3,0	0,22	0,27	0,33
> 3,0 ≤ 4,0	0,28	0,32	0,40
> 4,0 ≤ 8,0	0,28	0,32	0,40

8.3 Width

The tolerances on width for strip shall be the same as for sheet/plate (see 7.3).

8.4 Flatness

Requirements concerning flatness shall be agreed at the time of ordering.

NOTE: Any requirements agreed shall take into account the processing equipment at the user's disposal.

8.5 Edge camber

For strip ≥ 600 mm, the edge camber shall not exceed 20 mm for any length of 5 000 m in the case of strip with mill edges and 15 mm in the case of strip with trimmed edges.

For strip < 600 mm wide slit from wide strip, the tolerances on edge camber shall be agreed at the time of ordering.

9 Measurement

9.1 Thickness

9.1.1 The thickness shall be measured at any point situated at least 40 mm from the edges for products with mill edges and at least 25 mm from the edges for products with trimmed edges.

9.1.2 The crown shall be measured as the thickness difference between the centreline of the product and a measuring point at 40 mm from any edge of the product in case of mill edges and at 25 mm in case of trimmed edges.

9.1.3 The difference in thickness within one coil shall be measured at a line with a invariable distance from the longitudinal edges (minimum distance from the edges in accordance with 9.1.1).

9.2 Length

The length shall be measured along one of the longer edges of the sheet/plate.

9.3 Width

The width shall be measured at right angles to the longitudinal axis of the product.

9.4 Flatness

Deviation from flatness shall be determined by measuring the deviation in distance between the product and a flat horizontal surface on which it is placed.

9.5 Out-of-squareness

The out-of-squareness, u, is the orthogonal projection of a transverse edge over a longitudinal edge (see figure 1).

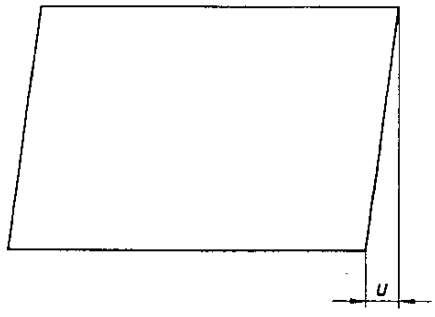

Figure 1: Out-of-squareness, u

9.6 Edge camber

The edge camber is the maximum deviation of a longitudinal edge from a straight edge measuring base applied to it.

The camber is measured on the concave edge.

For sheet/plate, the measuring base shall be the length of the product for a nominal length $< 5\,000$ mm.

For strip and sheet/plate with a nominal length $\geq 5\,000$ mm, the measuring base shall be 5 000 mm, taken anywhere along the edge but excluding the uncropped ends.

10 Options (see 4.2)

1) Whether trimmed edges are required (see 4.1 and 6.2).

2) Whether coils may be delivered with welds (see 6.3).

3) Whether for steels with normal deformation resistance at elevated temperatures closer tolerances on flatness are required (see 7.4.1).

4) Whether for steels with high deformation resistance at elevated temperatures of categories B and C, closer tolerances on flatness are required (see 7.4.2).

5) Whether the tolerances on out-of-squareness and edge camber shall be replaced by a requirement that a perfect rectangle formed by the ordered width and length dimensions can be superimposed into the sheets delivered (see 7.7).

6) Whether for hot rolled strip for cold rolling, maximum values for crown according to table 8 and permissible thickness differences within one coil according to table 9 are required (see 8.2.2).

7) Whether closer tolerances on thickness and crown are required (see 8.2.3).

Annex A (informative)
List of corresponding national designations and standards or specifications for categories B, C and D

In addition to table 3, the corresponding national designations and standards or specifications for the categories B, C and D are listed in tables A.1 to A.3.

Table A.1: Corresponding national designations and standards for category B (increment of 15%)

Europe		Germany		France	
Designation	Standardized in	Designation	Standardized in	Designation	Standardized in
Fe 490-2	EN 10 025	St 50-2	DIN 17 100	A 50-2	NF A 35-501
Fe 590-2	EN 10 025	St 60-2	DIN 17 100	A 60-2	NF A 35-501
Fe 690-2	EN 10 025	St 70-2	DIN 17 100	A 70-2	NF A 35-501
Fe 510 C; D1; D2 DD1; DD2	EN 10 025	St 52-3	DIN 17 100	E 36-3; E 36-4	NF A 36-101
Fe 510 C1 KI;	prEN 10 155	–	–	E 36 W A3;	NF A 35-502
D1 KI; C2 KI;	prEN 10 155	–	–	E 36 W A4; B3	NF A 35-502
D2 KI; DD2 KI	prEN 10 155	WTSt 52-3	SEW 087	E 36 W B4	NF A 35-502
–	–	QStE340N	SEW 092	–	–
Fe E 355-TM; -TD	EU 149-80	QStE340TM	SEW 092	E 335 D	NF A 36-203
Fe E 355 KG N	prEN 10 113-2	StE355	DIN 17 102	E 355 R	NF A 36-201
Fe E 355 KG TM	prEN 10 113-3	BStE355TM	SEW 083	–	–
Fe E 355 KT N	prEN 10 113-2	TStE355	DIN 17 102	E 355 FP	NF A 36-201
Fe E 355 KT TM	prEN 10 113-3	BTStE355TM	SEW 083	–	–
PH 295	prEN 10 028-2	17 Mn 4	DIN 17 155	A 48 CP; AP	NF A 36-205
PH 355	prEN 10 028-2	19 Mn 5	DIN 17 155	A 52 CP; AP	NF A 36-205
1 C 35	EN 10 083-2	C 35	DIN 17 200	AF 55 C 35	NF A 33-101
2 C 35	EN 10 083-1	Ck 35	DIN 17 200	XC 38	NF A 35-553
C 36	EU 86-70	Cf 35	DIN 17 212	XC 38 TC	not standardized
1 C 45	EN 10 083-2	C 45	DIN 17 200	AF 65 C 45	NF A 33-101
2 C 45	EN 10 083-1	Ck 45	DIN 17 200	XC 45	NF A 35-553
–	–	C 45 W	DIN 17 350	–	–
C 46	EU 86-70	Cf 45	DIN 17 212	XC 42 H 1	NF A 35-552
1 C 50	EN 10 083-2	C 50	DIN 17 200	–	–
2 C 50	EN 10 083-1	Ck 50	DIN 17 200	XC 50	NF A 35-553
16 Mo 3	prEN 10 028-2	15 Mo 3	DIN 17 155	15 D 3	NF A 36-206
28 Mn 6	EN 10 083-1	28 Mn 6	DIN 17 200	–	–
–	–	32 Cr 2	DIN 17 200	–	–
38 Cr 2	EN 10 083-1	38 Cr 2	DIN 17 200	38 C 2	NF A 35-552
46 Cr 2	EN 10 083-1	46 Cr 2	DIN 17 200	–	–
–	–	28 Cr 4	DIN 17 200	–	–
34 Cr 4	EN 10 083-1	34 Cr 4	DIN 17 200	32 C 4	NF A 35-522
41 Cr 4	EN 10 083-1	41 Cr 4	DIN 17 200	42 C 4	NF A 35-552
–	–	17 Cr 3	DIN 17 210	–	–
–	–	20 Cr 4	DIN 17 210	–	–
45 Cr 2	EU 86-70	45 Cr 2	DIN 17 212	42 C 2	NF A 35-552
38 Cr 4	EU 86-70	38 Cr 4	DIN 17 212	–	–
–	–	42 Cr 4	DIN 17 212	42 C 4	NF A 35-552
16 MnCr 5	EU 84-70	16 MnCr 5	DIN 17 210	16 MC 5	NF A 35-551
–	–	20 MnCr 5	DIN 17 210	20 MC 5	NF A 35-551
–	–	22 CrMoS 35	DIN 17 210	–	–
13 CrMo 4 5	prEN 10 028-2	13 CrMo 4 4	DIN 17 155	15 CD 2.05 15 CD 4.05	NF A 36-206 NF A 36-206
10 CrMo 9 10	prEN 10 028-2	10 CrMo 9 10	DIN 17 155	12 CD 9.10	NF A 36-210 NF A 36-206
All ferritic and martensitic stainless steels	EU 88-86 Part 2	All ferritic and martensitic stainless steels	DIN 17 440	All ferritic and martensitic stainless steels	NF A 35-573

(continued)

Table A.1 (concluded)

Europe		United Kingdom		Italy	
Designation	Standardized in	Designation	Standardized in	Designation	Standardized in
Fe 490-2	EN 10025	–	–	Fe 490	UNI 7070-82
Fe 590-2	EN 10025	–	–	Fe 590	UNI 7070-82
Fe 690-2	EN 10025	–	–	Fe 690	UNI 7070-82
Fe 510 C; D1; D2 DD1; DD2	EN 10025	50C; 50D	BS 4360	Fe 510 C; D	UNI 7070-82
Fe 510 C1 KI;	prEN 10155	WR50A	BS 4360	–	–
D1 KI; C2 KI;	prEN 10155	WR50B	BS 4360	–	–
D2 KI; DD2 KI	prEN 10155	WR50C	BS 4360	–	–
Fe E 355-TM; -TD	EU 149-80	43F35	BS 1449 Part 1	Fe E 355-TM; -TD	UNI 8890-87
Fe E 355 KG N	prEN 10113-2	–	–	Fe E 355 KG	UNI 7382-75
Fe E 355 KG TM	prEN 10113-3	–	–	–	–
Fe E 355 KT N	prEN 10113-2	–	–	Fe E 355 KT	UNI 7382-75
Fe E 355 KT TM	prEN 10113-3	–	–	–	–
PH 295	prEN 10028-2	–	–	Fe E 295	UNI EU 28-88
PH 355	prEN 10028-2	–	–	Fe E 355-2	UNI EU 28-88
				Fe E 355-3	UNI EU 28-88
1 C 35	EN 10083-2	–	–	1 C 35	UNI 8373-82
2 C 35	EN 10083-1	080M36	BS 970 Part 1	C 35	UNI 7845-78; UNI 7874-79 UNI 8787-85
C 36	EU 86-70	060A32	BS 970 Part 1	C 36	UNI 7847-79; UNI 8551-84
1 C 45	EN 10083-2	–	–	1 C 45	UNI 8373-82
2 C 45	EN 10083-1	080M46	BS 970 Part 1	C 45	UNI 7845-78; UNI 7874-79 UNI 8787-85
–	–	–	–	–	–
C 46	EU 86-70	080M46	BS 970 Part 1	C 46	UNI 7847-79; UNI 8551-84
1 C 50	EN 10083-2	–	–	1 C 50	UNI 8373-82
2 C 50	EN 10083-1	080M50	BS 970 Part 1	C 50	UNI 7845-78; UNI 8787-85 UNI 7874-79
16 Mo 3	prEN 10028-2	243	BS 1501 Part 2	16 Mo 3	UNI EU 28-88
28 Mn 6	EN 10083-1	150M19	BS 970 Part 1	C 28 Mn	UNI 7874-79
–	–	–	–	–	–
38 Cr 2	EN 10083-1	–	–	38 Cr 2	UNI 7874-79
46 Cr 2	EN 10083-1	–	–	–	–
–	–	580A30	BS 970 Part 1	–	–
34 Cr 4	EN 10083-1	530H32	BS 970 Part 1	34 Cr 4	UNI 7874-79
41 Cr 4	EN 10083-1	530M40	BS 970 Part 1	41 Cr 4	UNI 7874-79; UNI 8787-85 UNI 7845-78
–	–	–	–	–	–
–	–	–	–	–	–
45 Cr 2	EU 86-70	–	–	45 Cr 2	UNI 7847-79; UNI 8551-84
38 Cr 4	EU 86-70	–	–	38 Cr 4	UNI 7847-79; UNI 8551-84
–	–	530A40	BS 970 Part 1	41 Cr 4	UNI 7874-79
16 MnCr 5	EU 84-70	527M17	–	16 MnCr 5	UNI 7846-78; UNI 8550-84 UNI 8788-85
–	–	–	–	20 MnCr 5	UNI 7846-78; UNI 8550-84 UNI 8788-85
–	–	–	–	–	–
13 CrMo 4 5	prEN 10028-2	620	BS 1501 Part 2	14 CrMo 4 5	UNI EU 28-88
10 CrMo 9 10	prEN 10028-2	622	BS 1501 Part 2	14 CrMo 4 5	UNI EU 28-88
All ferritic and martensitic stainless steels	EU 88-86 Part 2	All ferritic and martensitic stainless steels	BS 1449 Part 2	All ferritic and martensitic stainless steels	UNI 6900 UNI 6901 UNI 8317

Table A.2: Corresponding national designations and standards for category C (increment of 30 %)

Europe		Germany		France	
Designation	Standardized in	Designation	Standardized in	Designation	Standardized in
360; 360 QT; 360 TM	prEN 10 208-2	StE 360.7; TM	DIN 17 172	–	–
–	–	StE 380	DIN 17 102	–	–
–	–	QSt E 380 N	SEW 092	–	–
–	–	StE 385.7	DIN 17 172	–	–
415; 415 QT; 415 TM	prEN 10 208-2	StE 415.7; TM	DIN 17 172	–	–
–	–	StE 420	DIN 17 102	E 420	NF A 36-201
Fe E 420 KG TM	prEN 10 113-3	BStE 420 TM	SEW 083	–	–
Fe E 420 KT TM	prEN 10 113-3	BTStE 420 TM	SEW 083	–	–
Fe E 420-TM; -TD	EU 149-80	QSt E 420 N	SEW 092	–	–
P 420 N	prEN 10 028-3	–	–	–	–
445; 445 QT; 445 TM	prEN 10 208-2	StE 445.7 TM	DIN 17 172	–	–
Fe E 460 KG N	prEN 10 113-2	StE 460	DIN 17 102	E 460	NF A 36-201
Fe E 460 KG TM	prEN 10 113-3	BStE 460 TM	SEW 083	–	–
Fe E 460 KT N	prEN 10 113-2	TStE 460	DIN 17 102	E 460	NF A 36-201
Fe E 460 KT TM	prEN 10 113-3	BTStE 460 TM	SEW 083	–	–
Fe E 460 V; V KG; V KW; V KT	EU 137-83	–	–	E 460 T	NF A 36-204
–	–	QSt E 460 N	SEW 092	–	–
P 460 N	prEN 10 028-3	–	–	–	–
–	–	StE 500	DIN 17 102	–	–
–	–	QSt E 500 N	SEW 092	–	–
–	–	BSt E 500 TM	SEW 083	–	–
–	–	BSt E 550 TM	SEW 083	–	–
–	–	QSt E 550 TM	SEW 092	–	–
C 53	EU 86-70	Cf 53	DIN 17 212	XC 48 TS	not standardized
1 C 55	EN 10 083-2	C 55	DIN 17 200	AF 70 C 55	NF A 33-101
2 C 55	EN 10 083-1	Ck 55	DIN 17 200	XC 54	NF A 35-553
1 CS 55	EU 132-79	C 55	DIN 17 222	42 C 2	NF A 35-552
1 C 60	EN 10 083-2	C 60	DIN 17 200	–	–
2 C 60	EN 10 083-1	Ck 60	DIN 17 200	XC 60	NF A 35-553
1 CS 60	EU 132-79	C 60	DIN 17 222	AF 70 C 55	NF A 33-101
–	–	C 60 W	DIN 17 350	–	–
1 CS 67	EU 132-79	C 67	DIN 17 222	–	–
25 CrMo 4	EN 10 083-1	25 CrMo 4	DIN 17 200	25 CD 4	NF A 35-553
34 CrMo 4	EN 10 083-1	34 CrMo 4	DIN 17 200	35 CD 4	NF A 35-553
41 CrMo 4	EU 86-70	41 CrMo 4	DIN 17 212	42 CD 4	NF A 35-553
42 CrMo 4	EN 10 083-1	42 CrMo 4	DIN 17 200	42 CD 4	NF A 35-553
14 CrNi 6	EU 84-70	15 CrNi 6	DIN 17 210	–	–
20 NiCrMo 2	EU 84-70	21 NiCrMo 2	DIN 17 210	20 NCD 2	NF A 35-553
17 CrNiMo 7	EU 84-70	17 CrNiMo 7	DIN 17 210	18 NCD 6	not standardized
All non-Mo-alloyed austenitic stainless steels	EU 88-86 Parts 2 and 3	All non-Mo-alloyed austenitic stainless steels	DIN 17 440	All non-Mo-alloyed austenitic stainless steels	NF A 35-573 NF A 36-209

(continued)

Table A.2 (concluded)

Europe		United Kingdom		Italy	
Designation	Standardized in	Designation	Standardized in	Designation	Standardized in
360; 360 QT; 360 TM	prEN 10 208-2	–	–	–	–
–	–	–	–	Fe E 390	UNI 7382-75
–	–	–	–	Fe E 380 TD	UNI 8890-87
–	–	–	–	–	–
415; 415 QT; 415 TM	prEN 10 208-2	–	–	–	–
–	–	55EE	BS 4360	–	–
Fe E 420 KG TM	prEN 10 113-3	–	–	–	–
Fe E 420 KT TM	prEN 10 113-3	–	–	–	–
Fe E 420-TM; -TD	EU 149-80	–	–	Fe E 420 TM; TD	UNI 8890-87
P 420 N	prEN 10 028-3	–	–	–	–
445; 445 QT; 445 TM	prEN 10 208-2	–	–	–	–
Fe E 460 KG N	prEN 10 113-2	–	–	Fe E 460 KG	UNI 7382-75
Fe E 460 KG TM	prEN 10 113-3	–	–	–	–
Fe E 460 KT N	prEN 10 113-2	–	–	Fe E 460 KT	UNI 7382-75
Fe E 460 KT TM	prEN 10 113-3	–	–	–	–
Fe E 460 V; V KG; V KW; V KT	EU 137-83	–	–	Fe E 460 V; V KG; V KW; V KT	UNI EU 137-89
–	–	–	–	Fe E 460 TD	UNI 8890-87
P 460 N	prEN 10 028-3	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	Fe E 560 TM	UNI 8890-87
C 53	EU 86-70	070M55	BS 970 Part 1	C 53	UNI 7847-79; UNI 8551-84
1 C 55	EN 10 083-2	–	–	1 C 55	UNI 8373-82
2 C 55	EN 10 083-1	070M55	BS 970 Part 1	C 55	UNI 7895-78; UNI 7874-79 UNI 8787-85
1 CS 55	EU 132-79	070M55	BS 970 Part 1	C 55	UNI 7064-82
1 C 60	EN 10 083-2	–	–	1 C 60	UNI 8373-82
2 C 60	EN 10 083-1	070M60	–	C 60	UNI 7845-78; UNI 7874-79 UNI 8787-85
1 CS 60	EU 132-79	080A57	BS 970 Part 1	C 60	UNI 7064-82
–	–	–	–	–	–
1 CS 67	EU 132-79	080A67	–	C 67	UNI 7064-82
25 CrMo 4	EN 10 083-1	708A25	BS 970 Part 1	25 CrMo 4	UNI 7845-78; UNI 7874-79 UNI 8787-85
34 CrMo 4	EN 10 083-1	708A30	BS 970 Part 1	35 CrMo 4	UNI 7845-78; UNI 7874-79 UNI 8787-85
41 CrMo 4	EU 86-70	708M40	BS 970 Part 1	41 CrMo 4	UNI 7847-79; UNI 8551-84
42 CrMo 4	EN 10 083-1	708M40	BS 970 Part 1	42 CrMo 4	UNI 7845-78; UNI 7874-79 UNI 8787-85
14 CrNi 6	EU 84-70	–	–	–	–
20 NiCrMo 2	EU 84-70	805M20	BS 970 Part 1	20 NiCrMo 2	UNI 7846-78; UNI 8550-84 UNI 8788-85
17 CrNiMo 7	EU 84-70	820A16	BS 970 Part 1	(18 NiCrMo 7)	UNI 7846-78; UNI 8550-84 UNI 8788-85
All non-Mo-alloyed austenitic stainless steels	EU 88-86 Parts 2 and 3	All non-Mo-alloyed austenitic stainless steels	BS 1449 Part 2 BS 1501 Part 3	All non-Mo-alloyed austenitic stainless steels	UNI 6900 UNI 6901 UNI 7500 UNI 8317

Table A.3: Corresponding national designations and standards for category D (increment of 40 %)

Europe		United Kingdom		Italy	
Designation	Standardized in	Designation	Standardized in	Designation	Standardized in
480 QT; 480 TM	prEN 10 208-2	StE 480.7 TM	DIN 17 172	–	–
Fe E 490-TM; -TD	EU 149-80	QStE 500 TM; N	SEW 092	–	–
Fe E 500 V; V KG; V KW; V KT	EU 137-83	–	–	E 500 T	NF A 36-204
550 QT; 550 TM	prEN 10 208-2	–	–	–	–
Fe E 550 V; V KG; V KW; V KT	EU 137-83	–	–	E 550 T	NF A 36-204
Fe E 560-TM	EU 149-2-80	QStE 550 TM	SEW 092	–	–
Fe E 620 V; V KG; V KW; V KT	EU 137-83	–	–	E 620 T	NF A 36-204
Fe E 690 V; V KG; V KW; V KT	EU 137-83	–	–	E 690 T	NF A 36-204
CT 70	EU 96-79	C 70 W 2	DIN 17 350	–	–
1 CS 75	EU 132-79	C 75	DIN 17 222	C 75	NF A 37-502
CT 80	EU 96-79	C 80 W 1	DIN 17 350	–	–
–	–	C 85 W	DIN 17 350	–	–
2 CS 85	EU 132-79	Ck 85	DIN 17 222	XC 90	NF A 37-502 NF A 35-533
2 CS 100	EU 132-79	Ck 101	DIN 17 222	XC 100	NF A 37-502 NF A 35-533
CT 105	EU 96-79	C 105 W 1	DIN 17 350	–	–
CT 120	EU 96-79	C 125 W	not standardized	–	–
50 CrMo 4	EN 10 083-1	50 CrMo 4	DIN 17 200	–	–
36 CrNiMo 4	EN 10 083-1	36 CrNiMo 4	DIN 17 200	40 NCD 3	not standardized
34 CrNiMo 6	EN 10 083-1	34 CrNiMo 6	DIN 17 200	35 NCD 6	–
30 CrNiMo 8	EN 10 083-1	30 CrNiMo 8	DIN 17 200	30 CND 8	NF A 35-552
–	–	30 CrNiV 8	DIN 17 200	–	–
51 CrV 4	EN 10 083-1	50 CrV 4	DIN 17 200	50 CV 4	NF A 35-553
All grades, e.g.	EU 85-70	All grades, e.g.	DIN 17 211	–	–
39 CrMoV 13	EU 85-70	39 CrMoV 13 9	DIN 17 211	–	–
31 CrMo 12	EU 85-70	31 CrMo 12	DIN 17 211	30 CD 12	–
34 CrAlMo 5	EU 85-70	34 CrAlMo 5	DIN 17 211	30 CAd6.12	not standardized
41 CrAlMo 7	EU 85-70	41 CrAl Mo 7	DIN 17 211	–	–
–	EU 86-70	Cf 70	DIN 17 212	XC 70	not standardized
–	EU 86-70	49 CrMo 4	DIN 17 212	–	–
All grades, e.g.	EU 89-71	All grades, e.g.	DIN 17 221		
50 CrV 4	EU 89-71	50 CrV 4	DIN 17 221	50 CV 4	NF A 35-553
–	–	55 Si 7	DIN 17 222	55 S 7	NF A 35-533
–	–	71 Si 7	DIN 17 222	–	–
67 SiCr 5	EU 132-79	67 SiCr 5	DIN 17 222	–	–
50 CrV 4	EU 132-79	50 CrV 4	DIN 17 222	50 CV 4	NF A 35-571 NF A 35-553
All Mo-alloyed austentic stainless steels	EU 88-86 Parts 2 and 3	All Mo-alloyed austentic stainless steels	DIN 17 440	All Mo-alloyed austentic stainless steels	NF A 35-573 NF A 36-209

(continued)

Table A.3 (concluded)

Europe		United Kingdom		Italy	
Designation	Standardized in	Designation	Standardized in	Designation	Standardized in
Fe E 490-TM; -TD	EU 149-80	–	–	Fe E 490 TM	UNI 8890-84
Fe E 500 V; V KG V KW; V KT	EU 137-83	–	–	Fe E 500 V; V KG; V KW; V KT	UNI EU 137-89
550 QT; 550 TM	prEN 10 208-2	–	–	–	–
Fe E 550 V; V KG; V KW; V KT	EU 137-83	–	–	Fe E 550 V; V KG; V KW; V KT	UNI EU 137-89
Fe E 560-TM	EU 149-2-80	–	–	Fe E 560 TM	UNI 8890-87
Fe E 620 V; V KG; V KW; V KT	EU 137-83	–	–	Fe E 620 V; V KG; V KW; V KT	UNI EU 137-89
Fe E 690 V; V KG; V KW; V KT	EU 137-83	–	–	Fe E 690 V; V KG; V KW; V KT	UNI EU 137-89
CT 70	EU 96-79	–	–	C 70 KU	UNI 2955/1-82
1 CS 75	EU 132-79	070A72	–	C 75	UNI 7064-82
CT 80	EU 96-79	–	–	C 80 KU	UNI 2955/1-82
–	–	–	–	–	–
2 CS 85	EU 132-79	–	–	C 85	UNI 7064-82
2 CS 100	EU 132-79	060A96	–	C 100	UNI 7064-82
CT 105	EU 96-79	–	–	C 100 KU	UNI 2955/1-82
CT 120	EU 96-79	–	–	C 120 KU	UNI 2955/1-82
50 CrMo 4	EN 10 083-1	708M40	BS 970 Part 1	–	–
36 CrNiMo 4	EN 10 083-1	817M37	–	–	–
34 CrNiMo 6	EN 10 083-1	817M40	BS 970 Part 1	–	–
30 CrNiMo 8	EN 10 083-1	823M30	–	–	–
51 CrV 4	EN 10 083-1	735A51	BS 970 Part 2	50 CrV 4	UNI 7845-78; UNI 7874-79 UNI 8787-85
All grades, e.g.	EU 85-70	–	–	–	–
39 CrMoV 13	EU 85-70	–	–	–	–
31 CrMo 12	EU 85-70	722M24	BS 970 Part 1	31 CrMo 12	UNI 8552-84; UNI 8077-80
34 CrAlMo 5	EU 85-70	–	–	–	–
41 CrAlMo 7	EU 85-70	–	–	41 CrAlMo 7	UNI 8552-84, UNI 8077-80
–	EU 86-70	–	–	–	–
–	EU 86-70	–	–	–	–
All grades, e.g.	EU 89-71			All grades, e.g.	UNI 3545-80
50 CrV 4	EU 89-71	735A51	BS 970 Part 2	50 CrV 4	UNI 3545-80
–	–	251A58	BS 970 Part 2	55 Si 7	UNI 3545-80
–	–	–	–	–	–
67 SiCr 5	EU 132-79	–	–	67 SiCr 5	UNI 7064-82
50 CrV 4	EU 132-79	735A51	BS 970 Part 2	50 CrV 4	UNI 7064-82
All Mo-alloyed austenitic stainless steels	EU 88-86 Parts 2 and 3	All Mo-alloyed austenitic stainless steels	BS 1449 Part 2; BS 1501 Part 3	All Mo-alloyed austenitic stainless steels	UNI 6900 UNI 6901 UNI 7500 UNI 8317

Annex B (informative)

List of national standards which correspond with EURONORMs referenced

Until the following EURONORMs are transformed into European Standards, they may be either implemented or reference made to the corresponding national standards as listed in table B.1.

Table B.1: EURONORMs with corresponding national standards

EURONORM	Corresponding national standard in					
	Germany	France	United Kingdom	Spain	Italy	Belgium
48-1984	DIN 1016	NF A 46-100	BS 1449, P.1	UNE 36-553	UNI 6685	NBN 253-03
84-1970	DIN 17 210	NF A 35-551	BS 970 Part 1	UNE 36-013	UNI 8788	NBN A 21-227
88-1986	DIN 17 440	NF A 35-573 NF A 36-209	BS 970 Part 1		UNI 6900 UNI 6901 UNI 7500 UNI 8317	
96-1979	DIN 17 350	NF A 35-590	BS 4959	UNE 36-071 UNE 36-072/1-2	UNI 2955/1-2	NBN A 21-227
111-1977	DIN 1614	NF A 36-301	BS 1449 Part 1	UNE 36-093	UNI 5867	NBN A 23-102
120-1983	–	NF A 36-211	BS 5045 Part 2	UNE 36-129	UNI EU 120	–
137-1983	–	NF A 03-116	BS 1501 Part 1 BS 1449 Part 1 BS 4360	UNE 36-800	–	–
149-1980	SEW 093	NF A 36-203	BS 1449 Part 1	PrA 36-122	UNI 8890	NBN A 21-112
156-1980	–	–	–	UNE 36-084-1	UNI EU 156	–