SLOVENSKI STANDARD
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Svetli jekleni izdelki - Tehnični dobavni pogoji - 2. del: Jekla za splošne tehnične namene

Bright steel products - Technical delivery conditions - Part 2: Steels for general engineering purposes

Blankstahlerzeugnisse - Technische Lieferbedingungen - Teil 2: Stähle für allgemeine technische Verwendung

Produits en acier transformés a froid - Conditions techniques de livraison - Partie 2: Aciers d'usage général

Ta slovenski standard je istoveten z: EN 10277-2:1999

ICS:

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

SIST EN 10277-2:2000 **en**

EUROPEAN STANDARD
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English version

Bright steel products - Technical delivery conditions - Part 2: Steels for general engineering purposes

Produits en acier transformés à froid - Conditions techniques de livraison - Partie 2: Aciers d'usage général

Blankstahlerzeugnisse - Technische Lieferbedingungen - Teil 2: Stähle für allgemeine technische Verwendung

This European Standard was approved by CEN on 11 June 1999.

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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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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 prepared by Technical Committee ECISS/TC 23 "Steels for heat treatment, alloy steels and free-cutting steels - Qualities and dimensions", 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of an identical text or by endorsement, at the latest by January 2000, and conflicting national standards shall be withdrawn at the latest by January 2000.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association. This European Standard is considered to be a supporting standard to those application and product standards which in themselves support an essential safety requirement of a New Approach Directive and which make reference to this European Standard.

This European Standard EN 10277 "Bright steel products - Technical delivery conditions" is subdivided as follows:

Part 1: General;
part 2: Steels for general engineering purposes;
part 3: Free-cutting steels;
part 4: Case hardening steels;
part 5: Steels for quenching and tempering.

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

1 Scope

1.1 This part of EN 10277 applies to bright steel bars in the drawn, turned or ground condition, in straight lengths of general engineering steels.

1.2 This EN 10277-2 is complemented by EN 10277-1.

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 10025:1990+A1:1993	Hot rolled products of non-alloy structural steels - Technical delivery conditions (includes amendment A1:1993)
EN 10083-2:1991+A1:1996	Quenched and tempered steels - Part 2: Technical delivery conditions for unalloyed quality steels (includes amendment A1:1996)
EN 10277-1	Bright steel products - Technical delivery conditions - Part 1: General

3 Definitions

See EN 10277-1.

4 Classification and designation

4.1 Classification

All steels specified in this European Standard are classified as non-alloy quality steels.

4.2 Designation

See EN 10277-1.

NOTE: This Standard does not comprise impact requirements.

5 Information to be supplied by the purchaser

See EN 10277-1.

6 Manufacturing process

See EN 10277-1.

7 Requirements

7.1 Chemical composition

7.1.1 Cast analysis

The chemical composition of the steel according to the cast analysis shall be as specified in table 1.

7.1.2 Product analysis

The permissible deviations from the chemical composition as specified in table 1 for cast analysis and the product analysis of the steel shall be as specified in table 2.

7.2 Mechanical properties

The mechanical properties of the steels shall be as specified in table 3.

7.3 Supplementary or special requirements

See annex B of EN 10277-1.

8 Inspection and testing

See EN 10277-1.

9 Marking

See EN 10277-1.

Table 1: Chemical composition[1)]

Designation		Steel grade according to	Chemical composition, % by mass									
Steel	Steel		C	Si	Mn	P	S	N[2)3)]	Cr	Mo	Ni	Cr+Mo+Ni
S235JRG2	1.0122	EN 10025:1990+A1:1993	max. 0,17[4)]	-[5)]	max. 1,40	0,045	0,045	0,009	-	-	-	-
E295GC[6)]	1.0533[6)]	EN 10025:1990+A1:1993	-	-[7)]	-	0,045	0,045	0,009	-	-	-	-
E335GC	1.0543	EN 10025:1990+A1:1993	-	-[7)]	-	0,045	0,045	0,009	-	-	-	-
S355J2G3C	1.0569[6)]	EN 10025:1990+A1:1993	max. 0,20[8)]	0,55[9)]	max. 1,60	0,035	0,035	-	-	-	-	-
C10[10)]	1.0301[10)]	-	0,07 to 0,13	0,40	0,30 to 0,60	0,045	0,045	-	-	-	-	-
C15[10)]	1.0401[10)]	-	0,12 to 0,18	0,40	0,30 to 0,80	0,045	0,045	-	-	-	-	-
C16[10)]	1.0407[10)]	-	0,12 to 0,18	0,40	0,60 to 0,90	0,045	0,045	-	-	-	-	-
C35[10)]	1.0501[10)]	EN 10083-	0,32 to 0,39	0 40	0,50 to 0,80	0,045	0,045	-	0,40	0,10	0,40	0,63
C40[10)]	1.0511[10)]	EN 10083-	0,37 to 0,44	0,40	0,50 to 0,80	0,045	0,045	-	0,40	0,10	0,40	0,63
C45[10)]	1.0503[10)]	EN 10083-	0,42 to 0,50	0,40	0,50 to 0,80	0,045	0,045	-	0,40	0,10	0,40	0,63
C50[10)]	1.0540[10)]	EN 10083-	0,47 to 0,55	0,40	0,60 to 0,90	0,045	0,045	-	0,40	0,10	0,40	0,63
C60[10)]	1.0601[10)]	EN 10083-	0,57 to 0,65	0,40	0,60 to 0,90	0,045	0,045	-	0,40	0,10	0,40	0,63

1) Chemical composition is determined by cast analysis.
2) It is permissible to exceed the specified values provided that for each increase of 0,001 % N the P max. content will be reduced by 0,005 %; the N content of the ladle analysis, however, shall not be more than 0,012 %.
3) The max. value for nitrogen does not apply if the chemical composition shows a minimum total Al content of 0,020 % or if sufficient other N binding elements are present. The N binding elements shall be mentioned in the inspection document.
4) Max. 0,20 % C for nominal thicknesses > 16 mm.
5) Method of deoxidation optional.
6) For applications where weldability is necessary, steel S355J2G3C (1.0569) should be used instead of E295GC (1.0533).
7) Rimming steel not permitted.
8) Max. 0,22 % C for nominal thicknesses > 30 mm.
9) Fully killed steel containing nitrogen binding elements in amounts sufficient to bind the available nitrogen (for example min. 0,020 % Al). If other elements are used they shall be reported in the inspection document.
10) Steels with improved machinability and/or addition of lead (Pb) may be supplied on request (e.g. 0,15 % Pb to 0,35 % Pb).

Table 2: Permissible deviations between the product analysis and the limiting values given in table 1 for the cast analysis

Element	Specified maximum content in the cast analysis % by mass	Steel grades	Permissible deviations [1] % by mass
C	≤ 0,17 > 0,17 ≤ 0,20	S235JRG2C	+ 0,04 + 0,05
	≤ 0,20 > 0,20 ≤ 0,22	S355J2G3C	+ 0,03 + 0,04
	≤ 0,55 > 0,55 ≤ 0,65	C10, C15, C16, C35, C45, C50 C60	± 0,02 ± 0,03
Si	≤ 0,40	C10 to C60	+ 0,03
	≤ 0,55	S355J2G3C	+ 0,05
Mn	≤ 1,40	S235JRC	+ 0,10
	≤ 1,60	S355J2G3C	+ 0,10
	≤ 0,90	C10 to C60	± 0,04
P and S	≤ 0,035	S355J2G3C	+ 0,010
	≤ 0,045	S235JRC to E335GC	+ 0,010
		C10 to C60	+ 0,005
N		S235JRC to E335GC	+ 0,002
Cr	≤ 0,40	C35 to C60	+ 0,05
Mo	≤ 0,10		+ 0,03
Ni	≤ 0,40		+ 0,05

[1] ± means that in one cast, the deviation may occur over the upper value or under the lower value of the specified range in table 1, but not both at the same time.