



SLOVENSKI STANDARD
SIST EN 10277-5:2000
01-november-2000

Svetli jekleni izdelki - Tehnični dobavni pogoji - 5. del: Jekla za poboljšanje

Bright steel products - Technical delivery conditions - Part 5: Steels for quenching and tempering

Blankstahlerzeugnisse - Technische Lieferbedingungen - Teil 5: Vergütungsstähle

Produits en acier transformés a froid - Conditions techniques de livraison - Partie 5:
Aciers pour trempe et revenu (standards.iteh.ai)

Ta slovenski standard je istoveten z: ^{SIST EN 10277-5:2000} **EN 10277-5:1999**
<https://standards.iteh.ai/catalog/standards/sist/7d255c95-4e17-404a-9a37-8736ac2711eb/sist-en-10277-5-2000>

ICS:

77.140.01	Železni in jekleni izdelki na splošno	Iron and steel products in general
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 10277-5

July 1999

ICS 77.140.20; 77.140.60

English version

Bright steel products - Technical delivery conditions - Part 5: Steels for quenching and tempering

Produits en acier transformés à froid - Conditions
techniques de livraison - Partie 5: Aciers pour trempe et
revenu

Blankstahlerzeugnisse - Technische Lieferbedingungen -
Teil 5: Vergütungsstähle

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

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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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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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.

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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 steels for quenching and tempering.

1.2 This EN 10277-5 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 10083-1:1991+A1:1996	Quenched and tempered steels - Part 1: Technical delivery conditions for special steels
EN 10277-1	Bright steel products - Technical delivery conditions - Part 1: General

3 Definitions

For the purpose of this standard, the following definition applies in addition to the definitions in EN 10277-1.

3.1 Steels for quenching and tempering: Engineering steels which because of their chemical composition are suitable for hardening and in the quenched and tempered condition have good toughness at a given tensile strength.

4 Classification and designation

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4.1 Classification

Steel grades C35E, C35R, C40E, C40R, C45E, C45R, C50E, C50R, C60E and C60R are non-alloy special steels. All other steel grades covered by this European Standard are alloy special steels.

4.2 Designation

See EN 10277-1.

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, table 4 and table 5.

7.3 Hardenability

Where steels are ordered with hardenability requirements, the requirements of EN 10083-1 shall apply.

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7.4 Grain size

Unless otherwise agreed at the time of ordering the grain size shall be left to the discretion of the manufacturer. If a fine grain structure is required in accordance with a reference treatment, special requirement B.2 of EN 10277-1 shall be ordered.

7.5 Non-metallic inclusions

The degree of cleanness may be agreed in accordance with EN 10083-1:1991+A1:1996 corresponding to the special steel quality.

7.6 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.

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Table 1: Chemical composition (cast analysis) of steels for quenching and tempering

Designation		Steel grade according to	Chemical composition, % by mass ¹⁾²⁾												
Steel name	Steel number		C ³⁾	Si max.	Mn	P max.	S	Cr	Mo	Ni	V	Cr+Mo+Ni max. ³⁾			
C35E	1.1181	EN 10083-1:1991+A1:1996	0,32 to 0,39	0,40	0,50 to 0,80	0,035	max. 0,035	max. 0,40	max. 0,10	max. 0,40	-	0,63			
C35R	1.1180	EN 10083-1:1991+A1:1996	0,32 to 0,39	0,40	0,50 to 0,80	0,035	0,020 to 0,040	max. 0,40	max. 0,10	max. 0,40	-	0,63			
C40E	1.1186	EN 10083-1:1991+A1:1996	0,37 to 0,44	0,40	0,50 to 0,80	0,035	max. 0,035	max. 0,40	max. 0,10	max. 0,40	-	0,63			
C40R	1.1189	EN 10083-1:1991+A1:1996	0,37 to 0,44	0,40	0,50 to 0,80	0,035	0,020 to 0,040	max. 0,40	max. 0,10	max. 0,40	-	0,63			
C45E	1.1191	EN 10083-1:1991+A1:1996	0,42 to 0,50	0,40	0,50 to 0,80	0,035	max. 0,035	max. 0,40	max. 0,10	max. 0,40	-	0,63			
C45R	1.1201	EN 10083-1:1991+A1:1996	0,42 to 0,50	0,40	0,50 to 0,80	0,035	0,020 to 0,040	max. 0,40	max. 0,10	max. 0,40	-	0,63			
C50E	1.1206	EN 10083-1:1991+A1:1996	0,47 to 0,55	0,40	0,60 to 0,90	0,035	max. 0,035	max. 0,40	max. 0,10	max. 0,40	-	0,63			
C50R	1.1241	EN 10083-1:1991+A1:1996	0,47 to 0,55	0,40	0,60 to 0,90	0,035	0,020 to 0,040	max. 0,40	max. 0,10	max. 0,40	-	0,63			
C60E	1.1221	EN 10083-1:1991+A1:1996	0,57 to 0,65	0,40	0,60 to 0,90	0,035	max. 0,035	max. 0,40	max. 0,10	max. 0,40	-	0,63			
C60R	1.1223	EN 10083-1:1991+A1:1996	0,57 to 0,65	0,40	0,60 to 0,90	0,035	0,020 to 0,040	max. 0,40	max. 0,10	max. 0,40	-	0,63			
34CrS4	1.7037	EN 10083-1:1991+A1:1996	0,30 to 0,37	0,40	0,60 to 0,90	0,035	0,020 to 0,040	0,90 to 1,20	--	--	-	--			
41CrS4	1.7039	EN 10083-1:1991+A1:1996	0,38 to 0,45	0,40	0,60 to 0,90	0,035	0,020 to 0,040	0,90 to 1,20	--	--	-	--			
25CrMoS4	1.7213	EN 10083-1:1991+A1:1996	0,22 to 0,29	0,40	0,60 to 0,90	0,035	0,020 to 0,040	0,90 to 1,20	0,15 to 0,30	--	-	--			
42CrMoS4	1.7227	EN 10083-1:1991+A1:1996	0,38 to 0,45	0,40	0,60 to 0,90	0,035	0,020 to 0,040	0,90 to 1,20	0,15 to 0,30	--	-	--			
34CrNiMo6	1.6582	EN 10083-1:1991+A1:1996	0,30 to 0,38	0,40	0,50 to 0,80	0,035	max. 0,035	1,30 to 1,70	0,15 to 0,30	1,30 to 1,70	-	--			
51CrV4	1.8159	EN 10083-1:1991+A1:1996	0,47 to 0,55	0,40	0,70 to 1,10	0,035	max. 0,035	0,90 to 1,20	-	-	0,10 to 0,25	-			

¹⁾ Elements not quoted shall not be intentionally added to the steel without the agreement of the purchaser, other than for the purpose of finishing the heat. All reasonable precautions shall be taken to prevent the addition from scrap or other material used in manufacture of such elements which affect the hardenability, mechanical properties and applicability.

²⁾ Where requirements are made on hardenability (see 7.3) slight deviations from the limits for the cast analysis are permissible, except for the elements, carbon (see footnote ³⁾, phosphorus and sulphur; the deviations shall not exceed the specifications of table 2.

³⁾ If the unalloyed steels are ordered without hardenability requirements (symbols +H, +HH, +HL) or without requirements on the mechanical properties in the quenched and tempered condition restriction in the carbon range to 0,05% and/or the total sum of the elements Cr, Mo and Ni to $\leq 0,45\%$ may be agreed at the time of ordering.