SLOVENSKI STANDARD
oSIST prEN 10025-6:2018

01-september-2018

Vroče valjani izdelki iz konstrukcijskih jekel - 6. del: Tehnični dobavni pogoji za ploščate izdelke iz konstrukcijskih jekel z veliko plastično trdnostjo v kaljenem in popuščenem stanju

Hot rolled products of structural steels - Part 6: Technical delivery conditions for flat products of high yield strength structural steels in the quenched and tempered condition

Warmgewalzte Erzeugnisse aus Baustählen - Teil 6: Technische Lieferbedingungen für Flacherzeugnisse aus Stählen mit höherer Streckgrenze im vergüteten Zustand

Produits laminés à chaud en aciers de construction - Partie 6 : Conditions techniques de livraison pour produits plats des aciers à haute limite d'élesticité à l'état trempé et revenu

Ta slovenski standard je istoveten z: **prEN 10025-6**

ICS:

77.140.10	Jekla za toplotno obdelavo	Heat-treatable steels
77.140.50	Ploščati jekleni izdelki in polizdelki	Flat steel products and semi-products

oSIST prEN 10025-6:2018 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 10025-6

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ICS 77.140.10; 77.140.50

Will supersede EN 10025-6:2004+A1:2009

English Version

Hot rolled products of structural steels - Part 6: Technical delivery conditions for flat products of high yield strength structural steels in the quenched and tempered condition

Produits laminés à chaud en aciers de construction - Partie 6 : Conditions techniques de livraison pour produits plats des aciers à haute limite d'élesticité à l'état trempé et revenu

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This draft European Standard is submitted to CEN members for second enquiry. It has been drawn up by the Technical Committee ECISS/TC 103.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 10025-6:2018) has been prepared by Technical Committee ECISS/TC 103 "Structural steels other than reinforcements", the secretariat of which is held by DIN.

This document is currently submitted to the second CEN Enquiry.

This document will supersede EN 10025-6:2004+A1:2009.

This European Standard consists of the following parts, under the general title *Hot rolled products of structural steels:*

Part 1: General

Part 2: Technical delivery conditions for non-alloy structural steels

Part 3: Technical delivery conditions for normalized/normalized rolled weldable fine grain structural steels

Part 4: Technical delivery conditions for thermomechanical rolled weldable fine grain structural steels

Part 5: Technical delivery conditions for structural steels with improved atmospheric corrosion resistance

Part 6: Technical delivery conditions for flat products of high yield strength structural steels in the quenched and tempered condition

For a short transition period there will be a coexistence of EN 10025-1:2004 with EN 10025-2:2018 to EN 10025−6:2018, since the new EN 10025-1 has to fulfil the requirements of the CPR and will therefore be published later. For this short transition period up-to-the publication of the next edition of part 1 the following has to be taken into account for EN 10025-1:2004:

a) all dated and undated references to EN 10025-1:2004 to EN 10025-6:2004 are unchanged to this version with following exception: In 9.2.2.1 the reference must be 8.3.1 and 8.3.2 instead of 8.4.1 and 8.4.2;

b) Clauses 5, 12 and 13 of EN 10025-1:2004 are no longer relevant.

The main changes with respect to the previous edition are listed below:

a) part 6 is now a stand-alone standard for technical delivery conditions including the preparation of samples and test pieces, the test methods, the marking, labelling and packaging and the drawings;

b) for construction purposes this standard and part 1 must be used together;

c) requirements for elements not definded were added to 7.2.1 and 7.2.2;

d) Option 33 was added, Option 3 was renumbered to Option 24 and Option 9 was deleted;

e) Si-content in 7.2.4 was changed;

f) 7.4.3 concerning hot-dip zinc coating was modified;

g) in Tables 3 and 4 the values were extended for thicknesses up to 200 mm;

h) references were updated and document editorial revised.

1 Scope

This document specifies technical delivery conditions for flat products of high yield strength alloy special steels. The grades and qualities are given in Tables 1 to 3 (chemical composition) and Tables 4 to 6 (mechanical properties) and are supplied in the quenched and tempered condition.

The steels specified in this document are applicable to hot-rolled flat products with a minimum nominal thickness of 3 mm and a maximum nominal thickness of 200 mm for grades S460, S500, S550, S620 and S690, a maximum nominal thickness of 125 mm for grades S890 and S960, in steels which, after quenching and tempering, have a specified minimum yield strength of 460 MPa to 960 MPa.

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.

2.1 General standards

EN 1011-2, *Welding — Recommendations for welding of metallic materials — Part 2: Arc welding of ferritic steels*

EN 10020:2000, *Definition and classification of grades of steel*

EN 10021, *General technical delivery conditions for steel products*

EN 10025-1:2004, *Hot rolled products of structural steels — Part 1: General technical delivery conditions*

EN 10027-1, *Designation systems for steels — Part 1: Steel names*

EN 10027-2, *Designation systems for steels — Part 2: Numerical system*

EN 10079, *Definition of steel products*

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

EN 10163-2, *Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections — Part 2: Plate and wide flats*

EN 10164, *Steel products with improved deformation properties perpendicular to the surface of the product — Technical delivery conditions*

EN 10168, *Steel products — Inspection documents — List of information and description*

EN 10204, *Metallic products — Types of inspection documents*

EN ISO 14713-2:2009, *Zinc coatings — Guidelines and recommendations for the protection against corrosion of iron and steel in structures — Part 2: Hot dip galvanizing (ISO 14713-2:2009)*

CR 10320, *Optical emission analysis of low alloy steels (routine method) — Method for determination of C, Si, S, P, Mn, Cr, Ni and Cu*

2.2 Standards on tolerances on dimensions and shape

EN 10029, *Hot-rolled steel plates 3 mm thick or above — Tolerances on dimensions and shape*

EN 10048, *Hot rolled narrow steel strip — Tolerances on dimensions and shape*

EN 10051, *Continuously hot-rolled strip and plate/sheet cut from wide strip of non-alloy and alloy steels — Tolerances on dimensions and shape*

2.3 Standards on testing

EN 10160, *Ultrasonic testing of steel flat product of thickness equal or greater than 6 mm (reflection method)*

EN ISO 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method (ISO 148-1:2016)*

EN ISO 377, *Steel and steel products — Location and preparation of samples and test pieces for mechanical testing (ISO 377)*

EN ISO 6892-1:2016, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1:2016)*

EN ISO 14284, *Steel and iron — Sampling and preparation of samples for the determination of chemical composition (ISO 14284)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 10079 and the following apply.

3.1
quenching
operation which consists of cooling a ferrous product more rapidly than in still air

3.2
tempering
heat treatment applied to a ferrous product generally after quench hardening or other heat treatment to bring the properties to the required level

Note 1 to entry: Tempering consists of heating to specific temperatures ($<A_{C1}$) and soaking one or more times followed by cooling at an appropriate rate.

4 Classification and designation

4.1 Classification

4.1.1 Main quality classes

The steel grades specified in this document shall be classified as alloy special steels according to EN 10020.

4.1.2 Grades and qualities

This document specifies seven steel grades. They differ in their minimum yield strength at room temperature.

All steel grades may be supplied in the following qualities as specified at the time of the order:

— with specified minimum values of impact energy at temperatures not lower than −20 °C, designated as Q;

— with specified minimum values of impact energy at temperatures not lower than −40 °C, designated as QL;

— with specified minimum values of impact energy at temperatures not lower than −60 °C, designated as QL1.

4.2 Designation

4.2.1 For the steel grades covered by this document the steel names shall be allocated in accordance with EN 10027-1; the steel numbers shall be allocated in accordance with EN 10027-2.

4.2.2 The designation shall consist of:

— the number of this document (EN 10025-6);

— the steel name or the steel number; the steel name consisting of:

  — the symbol S (for structural steel);

  — the indication of the minimum specified yield strength for thickness ≤ 50 mm expressed in MPa;

  — the delivery condition Q;

  — the capital letter L or L1 for the quality with specified minimum values of impact energy at temperatures not lower than −40 °C or −60 °C.

EXAMPLE Structural steel (S) quenched and tempered (Q), with a specified minimum yield strength at room temperature of 460 MPa and with a specified minimum of impact energy at −40 °C (L):

EN 10025-6 – S460QL
or
EN 10025-6 - 1.8906

5 Information to be supplied by the purchaser

5.1 Mandatory information

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

a) quantity to be delivered;

b) product form and the number of the standard for dimensions and tolerances (see 2.2);

c) nominal dimensions and tolerances on dimensions and shape (see 7.7.1);

d) steel designation (see 4.2.2);

e) additional requirements of inspection and testing and all required options (see 5.2 and Clause 13);

f) type of inspection document according to EN 10204 (see 8.1).

5.2 Options

A number of options are specified in Clause 13. 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 5.1 a) to d) and f).

6 Manufacturing process

6.1 Steel making process

The steel making process is at the discretion of the manufacturer with the exclusion of the open hearth (Siemens-Martin) process.

See ***Option 1*** (details of manufacturing process).

6.2 Deoxidation and grain structure

Steels of EN 10025-6 shall:

— be fully killed;

— have a fine grain structure;

— contain nitrogen binding elements in amounts sufficient to bind the available nitrogen (for example min. 0,020 % total aluminium). The usual guideline is a minimum aluminium to nitrogen ratio of 2:1, when no other nitrogen binding elements are present. Such other elements shall be reported in the inspection document (see Table 1).

6.3 Delivery conditions

The products shall be supplied in the quenched and tempered condition (Q) as defined in Clause 3.

NOTE Direct quenching after hot-rolling followed by tempering is considered equivalent to conventional quenching and tempering.

7 Requirements

7.1 General

The requirements in 7.2 and 7.3 apply for sampling, preparation of test pieces and testing specified in Clauses 9 and 10.

7.2 Chemical composition

7.2.1 The chemical composition determined by ladle analysis shall comply with the specified values of Table 1.

For elements not defined in the table for the chemical composition for ladle analysis, limit values of Table 1 of EN 10020:2000 shall apply as maximum values.

7.2.2 The upper limits applicable for the product analysis are given in Table 2. The product analysis shall be carried out when specified at the time of the order.

See ***Option 2*** (product analysis).

For elements not defined in the table for the chemical composition for product analysis, limit values of Table 1 of EN 10020:2000 shall apply as maximum values.