



# SLOVENSKI STANDARD

## SIST EN 10025-5:2005

01-januar-2005

Nadomešča:  
SIST EN 10155:1998

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**Vročje valjani izdelki iz konstrukcijskih jekel – 5. del: Tehnični dobavni pogoji za konstrukcijska jekla z izboljšano odpornostjo proti atmosferski koroziji**

Hot rolled products of structural steels - Part 5: Technical delivery conditions for structural steels with improved atmospheric corrosion resistance

Warmgewalzte Erzeugnisse aus Baustählen - Teil 5: Technische Lieferbedingungen für wetterfeste Baustähle

Produits laminés a chaud en aciers de construction - Partie 5: Conditions techniques de livraison pour les aciers de construction a résistance améliorée a la corrosion atmosphérique

**Ta slovenski standard je istoveten z: EN 10025-5:2004**

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**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

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EUROPEAN STANDARD

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## Hot rolled products of structural steels - Part 5: Technical delivery conditions for structural steels with improved atmospheric corrosion resistance

Produits laminés à chaud en aciers de construction - Partie 5: Conditions techniques de livraison pour les aciers de construction à résistance améliorée à la corrosion atmosphérique

Warmgewalzte Erzeugnisse aus Baustählen - Teil 5: Technische Lieferbedingungen für wetterfeste Baustähle

This European Standard was approved by CEN on 1 April 2004.

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**EN 10025-5:2004 (E)****Foreword**

This document (EN 10025-5:2004) 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of an identical text or by endorsement, at the latest by May 2005, and conflicting national standards shall be withdrawn at the latest by May 2005.

This document supersedes together with EN 10025-1:2004, EN 10155:1993, *Structural steels with improved atmospheric corrosion resistance - Technical delivery conditions*.

The titles of the other parts of this document are:

*Part 1: General technical delivery conditions;*

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

This document has been prepared under Mandate M/120 given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of the EU Construction Products Directive (89/106/EEC). For relationship with the EU Construction Products Directive, see informative Annex ZA of EN 10025-1:2004.

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, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

## 1 Scope

Part 5 of this document, in addition to part 1, specifies requirements for flat and long products of hot rolled steels with improved atmospheric corrosion resistance in the grades and qualities given in Tables 2 and 3 (chemical composition) and Tables 4 and 5 (mechanical properties) in the usual delivery conditions as given in 6.3.

The thicknesses in which products of the steel grades and qualities specified in this document may be supplied are given in Table 1.

In addition to EN 10025-1:2004 the steels specified in this document are especially intended for use in welded, bolted and riveted components which shall have enhanced resistance to atmospheric corrosion, for service at ambient temperatures (subject to the restrictions described in 7.4.1).

The steels specified in this Part 5 are not intended to be heat treated except products delivered in the delivery condition +N. Stress relief annealing is permitted (see also the NOTE in 7.3.1.1 of EN 10025-1:2004). Products delivered in +N condition can be hot formed and/or normalized after delivery (see Clause 3).

## 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 10020, *Definition and classification of grades of steel.*

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, principal symbols.*

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

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: Plates and wide flats.*

EN 10163-3, *Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections – Part 3: Sections.*

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

EN 10221, *Surface quality classes for hot-rolled bars and rods – Technical delivery conditions.*

CR 10260, *Designation systems for steels – Additional symbols.*

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**EN 10025-5:2004 (E)****2.2 Standards on dimensions and tolerances (see 7.7.1)**

EN 10017, *Non-alloy steel rod for drawing and/or cold rolling – Dimensions and tolerances.*

EN 10024, *Hot rolled taper flange I sections - Tolerances on shape and dimensions.*

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

EN 10034, *Structural steel I and H sections - Tolerances on shape and dimensions.*

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

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

EN 10055, *Hot-rolled steel equal flange tees with radiused root and toes - Dimensions and tolerances on shape and dimensions.*

EN 10056-1, *Structural steel equal and unequal leg angles - Part 1: Dimensions.*

EN 10056-2, *Structural steel equal and unequal leg angles - Part 2: Tolerances on shape and dimensions.*

EN 10058, *Hot rolled flat steel bars for general purposes - Dimensions and tolerances on shape and dimensions.*

EN 10059, *Hot rolled square steel bars for general purposes - Dimensions and tolerances on shape and dimensions.*

EN 10060, *Hot rolled round steel bars for general purposes - Dimensions and tolerances on shape and dimensions.*

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EN 10061, *Hot rolled hexagon steel bars for general purposes - Dimensions and tolerances on shape and dimensions.*

EN 10067, *Hot rolled bulb flats - Dimensions and tolerances on shape, dimensions and mass.*

EN 10162, *Cold rolled steel sections - Technical delivery conditions - Dimensional and cross-sectional tolerances.*

EN 10279, *Hot rolled steel channels - Tolerances on shape and dimensions.*

**2.3 Standards on testing**

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

EN 10306, *Iron and steel - Ultrasonic testing of H beams with parallel flanges and IPE beams.*

EN 10308, *Non-destructive testing - Ultrasonic testing of steel bars.*

EN ISO 643, *Steels – Micrographic determination of the apparent grain size (ISO 643:2003).*

**3 Terms and definitions**

For the purposes of this document, the terms and definitions given in EN 10025-1:2004 and the following apply.



**3.1****normalizing rolling**

rolling process in which the final deformation is carried out in a certain temperature range leading to a material condition equivalent to that obtained after normalizing so that the specified values of the mechanical properties are retained even after normalizing

The abbreviated form of this delivery condition is +N.

NOTE In international publications for both the normalizing rolling, as well as the thermomechanical rolling, the expression "controlled rolling" may be found. However in view of the different applicability of the products a distinction of the terms is necessary.

**3.2****as-rolled**

delivery condition without any special rolling and/or heat treatment condition

The abbreviated form of this delivery condition is +AR.

**3.3****steel with improved atmospheric corrosion resistance**

steel in which a certain number of alloying elements, such as P, Cu, Cr, Ni, Mo, .... has been added in order to increase its resistance to atmospheric corrosion, by forming an auto-protective oxide layer on the base metal under the influence of weather conditions

NOTE 1 Steel with improved atmospheric corrosion resistance is often called weathering steel.

NOTE 2 Additional information for the use of steel with improved atmospheric corrosion resistance is given in Annex C.

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**4 Classification and designation**

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**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 the steel grades S235 and S355 (see Table 5), which differ in their mechanical properties.

The steel grades may be supplied in qualities J0, J2 and K2. The qualities differ in specified impact energy requirements.

Grade S355 is subdivided into the classes W and WP, which differ mainly in their carbon and phosphorus contents (see Tables 2 and 3) and availability (see Table 1).

**4.2 Designation**

**4.2.1** The designation shall be in accordance with EN 10025-1.

NOTE For a list of corresponding former designations and the former designations from EURONORM 155 (1980) and EN 10155:1993 see Annex A, Table A.1.

**4.2.2** The designation shall consist of:

- number of this document (EN 10025-5);
- steel name or the steel number; the steel name consisting of:

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- symbol S (for structural steel);
- indication of the minimum specified yield strength for thickness  $\leq 16$  mm expressed in MPa<sup>1</sup>);
- quality designation (see 4.1.2) in respect of specified impact energy values;
- letter W indicating that the steel has an improved atmospheric corrosion resistance;
- if applicable, the letter P for the class with a greater phosphorus content (only in the case of grade S355);
- the indication "+N or +AR", when the products are ordered and delivered in the condition +N or +AR (see 3.1, 3.2 and 6.3). The indication "+N or +AR" shall be added to the steel name or steel number.

EXAMPLE Structural steel (S) with improved atmospheric corrosion resistance (W), with a specified minimum yield strength at ambient temperature of 355 MPa<sup>1</sup>), with a minimum impact energy value of 27 J at 0 °C (J0) and delivery condition normalized rolled (or as rolled):

Steel EN 10025-5 - S355J0W+N (or +AR)

or

Steel EN 10025-5 - 1.8959+N (or +AR)

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## **5 Information to be supplied by the purchaser**

### **5.1 Mandatory information**

SIST EN 10025-5:2005

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The information that shall be supplied by the purchaser at the time of the order is specified in EN 10025-1.

In addition to EN 10025-1 the following information shall be supplied by the purchaser at the time of the order:

g) whether products have to be submitted to specific or non-specific inspection and testing and which inspection document is required (see 8.2);

### **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.

## **6 Manufacturing process**

### **6.1 Steel making process**

The steel making process shall be in accordance with EN 10025-1. If specified at the time of the order the steel making process shall be reported to the purchaser.

See option 1.

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<sup>1</sup>) 1 MPa = 1 N/mm<sup>2</sup>.

## 6.2 Deoxidation

6.2.1 The method of deoxidation shall be as given in Table 2.

6.2.2 The deoxidation methods are designated as follows:

- a) FN - Rimming steel not permitted;
- b) FF - Fully killed steel containing 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.

## 6.3 Delivery conditions

The delivery condition of long products and continuous mill flat products is at the manufacturer's discretion. The delivery condition of quarto mill products can only be +AR or +N at the manufacturer's discretion.

The delivery condition +AR or +N can be agreed at the time of the order.

See option 19a.

If an inspection document is required (see 8.2) the delivery condition shall be indicated in it with its specific symbol (+N, +AR or +M). In case the products are ordered in the delivery condition +N or +AR the specific symbol (+N or +AR) shall be added to the designation (see 4.2.2).

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## 7 Requirements

### 7.1 General

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The following requirements apply when sampling, preparation of test pieces and testing specified in Clauses 8, 9 and 10 are carried out.

### 7.2 Chemical composition

7.2.1 The chemical composition determined by ladle analysis shall comply with the specified values of Table 2.

7.2.2 The limits applicable for the product analysis are given in Table 3.

The product analysis shall be carried out when specified at the time of the order.

See option 2.

7.2.3 For steel grade S235 a maximum carbon equivalent value of 0,44 % and for steel grade S355 a maximum carbon equivalent value of 0,52 % based on the ladle analysis shall apply for all thicknesses. For the carbon equivalent value formula see 7.2.3 of EN 10025-1:2004.

### 7.3 Mechanical properties

#### 7.3.1 General

7.3.1.1 Under the inspection and testing conditions as specified in Clauses 8, 9 and 10 and in the delivery condition as specified in 6.3 the mechanical properties shall comply with the values given in Tables 4 and 5.