SLOVENSKI STANDARD
SIST EN 10221:1998

01-avgust-1998

Kakovostni razredi površin vroče valjanih drogov in palic - Tehnični dobavni pogoji

Surface quality classes for hot-rolled bars and rods - Technical delivery conditions

Oberflächengüteklassen für warmgewalzten Stabstahl und Walzdraht - Technische Lieferbedingungen

Classes de qualité de surface des barres et fils machine laminés a chaud - Conditions techniques de livraison

Ta slovenski standard je istoveten z: **EN 10221:1995**

ICS:

77.140.60 Jeklene palice in drogovi Steel bars and rods

SIST EN 10221:1998 **en**

EUROPEAN STANDARD **EN 10221**

NORME EUROPÉENNE

EUROPÄISCHE NORM November 1995

ICS 77.140.60; 77.140.70

Descriptors: iron- and steel products, hot rolled products, bars, wire rod, surface condition, delivery condition, designation, quality classes, inspection, tests

English version

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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.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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

Contents

Foreword

This draft European Standard has been drawn up by a joint working group of ECISS/TC 15 "Wire rod - Qualities, dimensions, tolerances and specific tests" (Secretariat: Italy) and ECISS/TC 23 "Steels for heat treatment, alloy steels and free-cutting steels - Qualities" (Secretariat: Germany).

This European Standard replaces:

prEN 10 163-4 Delivery requirements for surface quality of hot rolled steel products - Part 4: Round bars and wire rod

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of an identical text or by endorsement, at the latest by May 1996, and conflicting national standards shall be withdrawn at the latest by May 1996.

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

1 Scope

1.1 This European Standard specifies the requirements for the surface quality of hot rolled round bars and rods with nominal diameters of 5 mm $\leq d_N \leq$ 150 mm.

1.2 By agreement between the manufacturer and purchaser, this European Standard may be applied also for squares, hexagons and octagons.

1.3 This European Standard applies particularly for steels for engineering applications, but may by agreement also be applied for general structural steels or tool steels.

1.4 This European Standard does not include any requirements for the permissible depth of surface decarburization.

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.

prEN 10 079 Definition of steel products

ISO 7800 Metallic materials - Wire - Simple torsion test ,

3 Definitions

For the purposes of this European Standard the following definitions apply:

3.1 Delivery lot

Unless otherwise specified in the order or in the appropriate product standard, a quantity of steel of the same type and the same diameter ordered with the same requirements for the surface quality, delivered at the same time.

3.2 Bars, rod

See prEN 10 079.

3.3 Discontinuities

Surface discontinuities are geometric irregularities projecting inwards.

3.3.1 Imperfections

Discontinuities with a depth equal to or less than the specified limiting value.

3.3.1.1 Sharp discontinuities

All discontinuities which may act as a notch as, for example, laps, seams and cracks.

3.3.1.2 Shallow discontinuities

Discontinuities which have a less notchlike effect and which have a more shallow aspect such as rolled-in scale and slivers.

3.3.2 Defects

Discontinuities with a depth greater than the specified limiting value.

4 Requirements

4.1 General

The surface requirements are subdivided into the classes according to table 1 and figure 1. If the appropriate European Standard or EURONORM specifying the quality requirements for the material does not contain exact specifications, the required surface quality class and the admissible portion of defective material shall be stated in the order as indicated in 4.2.

4.2 Ordering

The following indications shall be given in the order:

a) the surface quality class (see table 1)

and either

b1) if the original depth of the surface discontinuities can still be determined after the processing of the material, the maximum admissible portion za of defective material in the total delivery lot found during or after further processing (see notes 1 and 2)

or

b2) if the total delivery lot can be checked before processing, the maximum admissible portion zb of defective material in the total delivery lot found before processing (see notes 1 and 2)

or

b3) if it is not possible to check the total delivery lot, special agreements shall be made with regard to the maximum admissible portion z of defective material

and

c) the type of proof, e.g. by sampling inspection giving the AQL and inspection plan, proof of quality level by statistical process control...

NOTE 1:
In view of the limitations of continuous inspection equipment for rod relative to the exactness of imperfection depth measurements it is normally only possible to inspect the ends of the coils. Therefore, it cannot be proved that no value greater than the specified value is to be found in the coil as a whole.

NOTE 2:
Additionally, the handling of defective material, e.g. whether it shall be sent back to the manufacturer or scrapped etc. should - also for cases where the total delivery lot is accepted - be agreed at the time of enquiry and order.

4.3 Designation

The required surface finish shall be designated at the time of enquiry and order. a) and b) below give examples of possible designations based on the sampling method specified by the purchaser, e.g. test plan, statistical process control etc. ...

a) Example for case b1 (see 4.2)
Agreed is surface quality class C and a maximum admissible portion za = 2,5 % of defective material in the total delivery lot found during or after further processing, corresponding to the agreed AQL of 2,5 %.

Designation:
Surface quality EN 10 221 - Class C - za 2,5 - AQL 2,5 %

b) Example for case b2 (see 4.2)
Agreed is surface quality class C and a maximum admissible portion zb = 0,5 % of defective material in the total delivery lot found before processing; proof corresponding to separate specification.

Designation:
Surface quality EN 10 221 - Class C - zb 0,5
Prof ...

5 Testing

5.1 General

5.1.1 The manufacturer takes under his own responsibility and according to his own judgement suitable measures to supervise his production in view of the specified surface quality requirements.

NOTE:
At the present state of the development, facilities for continuous measuring of the depth of defects at high temperatures have serious limitations. The rod manufacturer can normally, after rolling, only check the end of the coils for their compliance with the requirements for surface quality.

5.1.2 The purchaser has total freedom to check the surface quality of the delivered material by methods he regards as suitable. However, disputes shall be resolved using depth discontinuities measured by techniques specified in 5.2.3.2.

5.2 Test methods

5.2.1 General

5.2.1.1 The methods used for detecting discontinuities and measuring the depth of discontinuities shall be sufficiently accurate and shall give reproducible results.

5.2.1.2 Non-destructive methods (see 5.2.2.1 and 5.2.3.1) and also technological methods (see 5.2.2.2) are permitted.

5.2.1.3 In cases of dispute, the measures are carried out in accordance with 5.2.3.2 on products in the delivery condition shall be decisive.

5.2.2 Methods for the detection of discontinuities

The following or other suitable methods can be used for the detection of surface discontinuities.

5.2.2.1 Non-destructive methods

- visual examination,
- magnetic flux method: for example magnetic particle inspection or probe methods,
- inductive methods (eddy currents),
- dye penetrant,
- thermography.

5.2.2.2 Technological test methods

The following tests may be taken into consideration:

- warm compression tests,
- cold compression tests,
- torsion tests (see ISO 7800).

5.2.3 Methods for measuring the depth of discontinuities

5.2.3.1 Non-destructive test methods such as:

- magnetic flux measurement with rotating or stationary probes,
- inductive methods,
- potential probe method using direct current,
- ultrasonic tests

can only determine the depth of discontinuities approximately.

5.2.3.2 The exact determination of the depth of a discontinuity is to be carried out either by grinding the discontinuity down to its root or by examining a metallographic specimen. In both cases, the depth is measured in the radial direction (see also footnote 2 to table 1).