

Cold rolled narrow steel strip for heat treatment — Technical delivery conditions —

Part 1: General

The European Standard EN 10132-1:2000 has the status of a
British Standard

ICS 77.140.10; 77.140.50

National foreword

This British Standard is the official English language version of EN 10132-1:2000. Together with BS EN 10132-2 and BS EN 10132-3, it supersedes BS 1449-1.15:1991 which is withdrawn. Together with BS EN 10132-4 it supersedes BS 5770:Parts 1, 2 and 3:1981 which are withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ISE/31, Wrought steels, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 13 and a back cover.

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Technische Lieferbedingungen - Teil 1: Allgemeines

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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of an identical text or by endorsement, at the latest by August 2000, and conflicting national standards shall be withdrawn at the latest by August 2000.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.

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.

The European Standard EN 10132, Cold rolled narrow steel strip for heat-treatment - Technical delivery conditions, is subdivided as follows:

- Part 1: General;
- Part 2: Case hardening steels;
- Part 3: Steels for quenching and tempering;
- Part 4: Spring steels and other special applications.

1 Scope

1.1 This part of EN 10132 specifies the general technical delivery conditions for non-alloy and alloy cold rolled narrow steel strip in rolling widths < 600 mm for heat treatment.

1.2 In special cases supplementary requirements or deviations with respect to this European Standard may be agreed between the purchaser and the supplier at the time of enquiry and order (see annex A).

1.3 In addition to the requirements of this standard, the general technical delivery requirements specified in EN 10021 apply.

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.

CR 10260, *Designation systems for steel - Additional symbols*.

CR 10261, *Iron and steel - Review of available methods of chemical analysis*.

EN 10002-1, *Metallic materials - Tensile testing - Part 1: Method of test (at ambient temperature)*.

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

EN 10021, *General technical delivery requirements for steel and iron products*

EN 10027-1, *Designation systems for steel - Part 1: Steel names, principal symbols*.

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

EN 10052, *Vocabulary of heat treatment terms for ferrous products*.

EN 10079, *Definition of steel products*.

EN ISO 6508-1, *Metallic materials - Rockwell hardness test - Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T) (ISO 6508-1:1999)*.

EN 10132-2, *Cold rolled narrow steel strip - Technical delivery conditions - Part 2: Case hardening steels*.

EN 10132-3, *Cold rolled narrow steel strip - Technical delivery conditions - Part 3: Steel for quenching and tempering*.

EN 10132-4, *Cold rolled narrow steel strip - Technical delivery conditions - Part 4: Spring steels and other special applications.*

EN 10140, *Cold rolled narrow steel strip - Tolerances on dimensions and shape.*

EN 10204, *Metallic products - Types of inspection documents (includes amendment A1:1995).*

EN ISO 377, *Steel and steel products - Location and preparation of samples and test pieces for mechanical testing (ISO 377:1997).*

EN ISO 6507-1, *Metallic materials - Vickers hardness test - Part 1: Test method (ISO 6507-1:1997).*

EURONORM 103¹⁾, *Microscopic determination of the ferritic or austenitic grain size of steels.*

ISO 14284, *Steel and iron - Sampling and preparation of samples for the determination of chemical composition.*

3 Terms and definitions

For the purposes of this standard the following term and definition apply in addition to the terms and definitions in EN 10020, EN 10021, EN 10052, EN 10079, EN ISO 377 and ISO 14284:

3.1

production lot

products from the same cast, with the same thickness and the same heat-treatment cycle

¹⁾ It may be agreed at the time of ordering, until this EURONORM has been adopted as a European Standard, that either this EURONORM or a corresponding national standard should be applied.

4 Classification and designation

4.1 Classification

The classification of the relevant steel grades according to EN 10020 is indicated in EN 10132-2, EN 10132-3 and EN 10132-4.

4.2 Designation

4.2.1 Steel names

For the steel grades covered by this European Standard, the steel names as given in the relevant tables of EN 10132-2, EN 10132-3 and EN 10132-4 are allocated in accordance with EN 10027-1 and CR 10260.

4.2.2 Steel numbers

For the steel grades covered by this European Standard, the steel numbers as given in the relevant tables of EN 10132-2, EN 10132-3 and EN 10132-4 are allocated in accordance with EN 10027-2.

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 enquiry and order to enable the supplier to comply with the requirements of this European Standard:

- a) the quantity to be delivered;
- b) the designation of the product form (cold rolled narrow strip);
- c) the number of the dimensional standard (EN 10140);
- d) the dimensions and tolerances on dimensions and shape and, if applicable, letters denoting relevant special tolerances;
- e) the number of this European Standard including the number of the relevant part;
- f) steel name or steel number (see 4.2);
- g) the delivery condition (see 7.3);
- h) if required, the type of inspection document in accordance with EN 10204.

EXAMPLE 5 tons of cold rolled narrow strip EN 10140 - 1,50x200GK
EN 10132-2 - 16MnCr5+A
EN 10204 - 2.2

or

5 tons of cold rolled narrow strip EN 10140 - 1,50x200GK
EN 10132-2 - 1.7131+A
EN 10204 - 2.2

5.2 Options

A number of options are specified in this European Standard and listed below. If the purchaser does not indicate his wish to implement one of these options, the supplier shall act in accordance with the basic specification of this European Standard (see 5.1):

- a) any requirement on surface condition;
- b) any requirement concerning type of edges;
- c) any special requirement concerning bend test (see 7.5);
- d) any special requirement relating to grain size (see 7.6.1 and A.2);
- e) any requirement concerning non-metallic inclusions (see 7.6.2 and A.3);
- f) any requirement concerning surface roughness (see 7.7);
- g) any requirement on labelling (see clause 11);
- h) any special requirement on marking (see clause 11);
- i) any requirement on dimensions and weight of coils (see clause 11);
- j) any requirement on the method of packaging (see clause 11);
- k) any requirement concerning protection during transport and handling (see clause 11);
- l) any requirement concerning bar coding (see clause 11);
- m) any verification of the product analysis (see A.1).

6 Manufacturing process

6.1 General

The manufacturing process of the steel and of the products is left to the discretion of the manufacturer and subject to restrictions given by the requirements in 6.2.

6.2 Deoxidation

All steels shall be killed.

7 Requirements

7.1 General

The manufacturer is responsible, using the means he thinks fit, for controlling his production from the point of view of the various quality criteria specified.

7.2 Method of delivery

The products shall be delivered by cast or part of a cast. The number of casts per delivery shall be minimized as far as it is possible.

7.3 Delivery condition

The products shall be supplied as agreed at the time of enquiry and order in one of the delivery conditions indicated in EN 10132-2, EN 10132-3 and EN 10132-4.

7.4 Chemical composition

7.4.1 Cast analysis

The chemical composition of the steel as shown by the cast analysis shall conform with the values specified in the relevant tables of EN 10132-2, EN 10132-3 and EN 10132-4.

7.4.2 Product analysis

The permissible deviations in the product analysis in relation to the specified limits of cast analysis (see 7.4.1) are indicated in the relevant tables of EN 10132-2, EN 10132-3 and EN 10132-4.

7.5 Mechanical properties

The mechanical properties of the products shall meet the values stated in the relevant tables of EN 10132-2, EN 10132-3 and EN 10132-4.

7.6 Structure

7.6.1 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, the special requirement as detailed in A.2 shall be ordered.

7.6.2 Non-metallic inclusions

The steels shall have a degree of cleanliness corresponding to the special steel quality. The degree of cleanliness may be agreed at the time of enquiry and order (see A.3).

7.6.3 Decarburization

Independent of their heat treatment, all steels listed in EN 10132-3 with minimum carbon contents > 0,50 % and all steels listed in EN 10132-4 shall not have decarburization levels exceeding the limits outlined in EN 10132-3 and EN 10132-4.

7.7 Surface finish

All products shall have a smooth finish as described in EN 10132-2, EN 10132-3 and EN 10132-4.

Requirements concerning roughness may be agreed upon at the time of enquiry and order.

7.8 Dimensions and tolerances on dimensions and shape

The nominal dimensions and tolerances on dimensions and shape for the products shall conform to EN 10140, unless otherwise agreed at the time of enquiry and order. Width tolerances specified in EN 10140 may not be requested for strip in the quenched and tempered condition (+QT).

8 Inspection

8.1 General

The manufacturer shall carry out appropriate process control, inspection and testing to assure himself that the delivery complies with the requirements of the order.

This includes, for example, the following:

- A suitable frequency of verification of the dimensions of the products.
- An adequate intensity of visual examination of the surface quality of the products.

An appropriate frequency and type of test to ensure that the correct grade of steel is used.

The nature and frequency of these verifications, examinations and tests shall be determined by the manufacturer, in the light of the degree of consistency that has been determined by the evidence of the quality system. In view of this, verifications by specific tests for these requirements are not necessary unless otherwise agreed.

8.2 Specific inspection and testing

8.2.1 Verification of mechanical properties

Verification of the mechanical properties shall be carried out in the delivery condition which is specified in the relevant tables of EN 10132-2, EN 10132-3 and EN 10132-4.

8.2.2 Number and frequency of tests

The number of tests taken shall be a minimum of 1 test per production lot.

9 Sampling

9.1 The specifications of EN ISO 377 and ISO 14284 shall be observed in sampling and sample preparation. The stipulations in 9.2 apply additionally for the mechanical tests.

9.2 The samples for the tensile test shall be taken in such a way that they are located halfway between the centre and a longitudinal edge.

The samples shall be taken from products in the delivery condition. If agreed, the samples may be taken before flattening. For samples to be given a simulated heat treatment the conditions for annealing or hardening and tempering shall be agreed upon.

10 Test methods

10.1 Chemical analysis

The methods to be applied for the verification of the product analysis shall be agreed at the time of ordering, with reference to existing European Standards where these are available.

10.2 Tensile test

The tensile test shall be carried out in accordance with EN 10002-1.

10.3 Hardness test

The hardness test shall be carried out in accordance with EN ISO 6507-1 (Vickers) or EN ISO 6508-1 (Rockwell).

11 Labelling, packaging and protection

The manufacturer shall label the products in a suitable way so that it is possible to identify the manufacturer's name or symbol, the batch number, the nominal dimensions and the steel grade.

Any special or additional marking shall be agreed upon at the time of the enquiry or order.

The internal and external diameter of the coil and the method of packaging of the product to be delivered shall be agreed during ordering.

The products are normally supplied oiled. In this case, both sides are protected by a coat of non-drying neutral oil, free from foreign bodies and spread uniformly so that under the normal packing, transport, loading and storage conditions there will be no corrosion after three months.

If the transport and storage conditions make special corrosion protection necessary, the user shall inform the manufacturer of this at the time of ordering.

The oil film shall be removable by an alkaline solution or other normal solvents.

The selection of protection oils shall be the subject of a separate agreement.

Bar coding according to ENV 606 can be agreed at the time of enquiry and order.

12 Retests

For retests, EN 10021 shall apply.

Annex A (normative)

Supplementary or special requirements

NOTE One or more of the following supplementary or special requirements may be agreed upon at the time of enquiry and order. The details of these requirements may be agreed upon between the manufacturer and the purchaser at the time of enquiry and order, if necessary.

A.1 Product analysis

One product analysis shall be carried out per cast for elements for which values are specified for the cast analysis of the steel type concerned.

The conditions for sampling shall be in accordance with ISO 14284. In the case of dispute about the analytical method, the chemical composition shall be determined in accordance with a reference method taken from one of the European Standards listed in CR 10260.

A.2 Fine grain steel

When tested in accordance with EURONORM 103, the steel shall have an austenite grain size number of 5 and higher. If specific testing is ordered, it shall also be agreed whether this grain size requirement is to be verified by determining the aluminium content or micrographically. In the first case, the aluminium content shall also be agreed.

In the second case, one test piece shall be inspected per cast for the determination of the austenitic grain size. Sampling and sample preparation shall be as specified in EURONORM 103.

Unless otherwise agreed at the time of enquiry and order, the quenched grain size shall be determined. Hardening shall be carried out under the following conditions for the purpose of determining the quenched grain size:

- for steels with a lower carbon content limit $\leq 0,35 \%$ (880 ± 10) °C for 90 minutes/water;
- for steels with a lower carbon content limit $> 0,35 \%$ (850 ± 10) °C, 90 minutes/water.

In cases of dispute, pretreatment at 1 150 °C for 30 minutes/air shall be carried out in order to produce a uniform starting condition.

A.3 Content of non-metallic inclusions

The content of non-metallic inclusions shall be within limits which have been agreed upon, when microscopically determined according to an agreed procedure (for example see ENV 10247).

Bibliography

ENV 606, *Bar coded transport and handling labels for steel products.*

ENV 10247, *Metallographic test methods - Examination of steels using standard diagrams to assess the content of non-metallic inclusions.*

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