



SLOVENSKI STANDARD

SIST EN 10268:2006

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Cold rolled steel flat products with high yield strength for cold forming - Technical delivery conditions

Kaltgewalzte Flacherzeugnisse aus Stählen mit hoher Streckgrenze zum Kaltumformen -
Technische Lieferbedingungen

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Produits plats laminés à froid à haute limite d'élasticité pour formage à froid - Conditions techniques de livraison

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EUROPEAN STANDARD

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NORME EUROPÉENNE

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Cold rolled steel flat products with high yield strength for cold forming - Technical delivery conditions

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Kaltgewalzte Flacherzeugnisse aus Stählen mit hoher Streckgrenze zum Kaltumformen - Technische Lieferbedingungen

This European Standard was approved by CEN on 12 June 2006.

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This document (EN 10268:2006) has been prepared by Technical Committee ECISS/TC 13 "Flat products for cold working - Qualities, dimensions, tolerances and specific tests", the secretariat of which is held by IBN.

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of an identical text or by endorsement, at the latest by January 2007, and conflicting national standards shall be withdrawn at the latest by January 2007.

This document supersedes EN 10268:1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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1 Scope

This European Standard applies to cold rolled uncoated steel flat products for cold forming with high yield strength. The thickness is equal to or less than 3 mm.

These products are delivered in sheet, wide strip, slit wide strip, narrow strip or cut lengths obtained from slit wide strip, narrow strip or sheet.

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.

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

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

EN 10021:1993, *General technical delivery requirements for steel and iron products*

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

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

EN 10079:1992, *Definition of steel products* **(standards.iteh.ai)**

EN 10130, *Cold rolled low carbon steel flat products for cold forming - Technical delivery conditions*

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EN 10131, *Cold rolled uncoated low carbon and high yield strength steel flat products for cold forming - Tolerances on dimensions and shape*

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EN 10139, *Cold rolled uncoated mild steel narrow strip for cold forming - Technical delivery conditions*

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

EN 10204:2004, *Metallic products - Types of inspection documents*

prEN 10325, *Steel - Determination of yield strength increase by the effect of heat treatment (Bake-Hardening-Index)*

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

EN ISO 14284, *Steel and iron - Sampling and preparation of samples for the determination of chemical composition (ISO 14284:1996)*

ISO 10113, *Metallic materials - Sheet and strip - Determination of plastic strain ratio*

ISO 10275, *Metallic materials - Sheet and strip - Determination of tensile strain hardening exponent*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 10020:2000, EN 10021:1993, EN 10079:1992 and EN 10204:2004 and the following apply.

3.1

bake-hardening steels (B)

steels that demonstrate a defined increase in proof strength following heating in the region of 170 °C for 20 minutes

NOTE These steels have a good suitability for cold forming and present a high resistance to plastic straining which is increased on finished parts during the heat treatment. Dent resistance is improved. These steels are often used in car body outer parts.

3.2

rephosphorized steels (P)

steels that contain up to 0,12% P and achieve the required proof strength levels

NOTE These steels present a high mechanical resistance and a good suitability for cold forming due to solid solution hardening by phosphorus. They are used in car body panels and structural components due to their good impact and fatigue resistance properties.

3.3

low alloy / micro-alloyed steels (LA)

steels containing one or more of alloys Nb, Ti and V to achieve required proof strength levels

NOTE Combined precipitation and grain refinement hardening modes allow reaching a high mechanical resistance while reducing the content of alloying elements. Suitability for welding is improved and cold forming is limited. These steels are used in reinforcing structural parts and have good impact and fatigue strengths.

3.4

high strength interstitial free steels (Y)

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steels whose composition is controlled to achieve improved plastic strain ratio (r) and strain hardening exponent (n) values

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NOTE These steels have both a high mechanical strength and an excellent suitability for cold forming due to their solid solution hardening and interstitial free microstructure. They are used for complex components involving deep drawing processes.

3.5

isotropic steels (I)

steels with limited plastic strain ratio (r) value

NOTE These steels have excellent stretch formability due to their isotropic behaviour. They are used in the automotive industry for bonnets and doors.

4 Designation

The steel names are in compliance with EN 10027-1; the steel numbers with EN 10027-2.

The designation consists of the word "sheet", "cold rolled wide strip", "cold rolled narrow strip", "slit cold rolled wide strip" or "cut length" followed in order by:

- reference to this European Standard EN 10268;
- steel name or the steel number (see Table 1 or Table 2);
- symbol concerning the surface quality (A or B);
- if applicable, the symbol relating to the surface finish.

EXAMPLE 1 Designation of sheet made of steel grade HC260P (1.0417), surface quality A, surface finish normal (m):

Sheet EN 10268-HC260P-A-m
or
Sheet EN 10268-1.0417-A-m.

EXAMPLE 2 Designation of coil made of steel grade HC220B (1.0396), surface quality B, surface finish normal (m):

Coil EN 10268-HC220B-B-m
or
Coil EN 10268-1.0396-B-m.

5 Requirements

5.1 Steelmaking and manufacturing processes

Unless otherwise agreed at the time of enquiry or order, the steelmaking and manufacturing processes are left to the discretion of the manufacturer.

If specified by the purchaser, he or she will be informed of these processes.

5.2 Chemical composition

The chemical composition based on the ladle analysis shall be as given in Table 1.

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5.3 Delivery conditions

5.3.1 The products are supplied in the skin-passed condition only.

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5.3.2 Usually the products are supplied oiled. In this case, both sides are corrosion protected by a layer of neutral non-drying oil, free of impurities and uniformly spread so that under the normal packing, transportation, loading and storage conditions, there will be no corrosion for up to three months.

The layer of oils shall be capable of being removed by alkaline solutions or usual solvents.

The choice of protective oils may be subject to a special agreement.

If the purchaser does not require the surfaces to be oiled, this shall be clearly indicated at the time of order.

If the conditions of transportation or storage are such that special protection against corrosion is required, the purchaser shall inform the manufacturer at the time of enquiry and order.

NOTE If the order is for un-oiled products, the manufacturer is not responsible for the risk of corrosion. The purchaser is also advised that there is a greater risk of the appearance of light scratches during handling, transportation and application.

Table 1 — Ladle analysis chemical composition

Steel name	Steel number	C max %	Si max %	Mn max %	P max %	S max %	Al min %	Ti max a b %	Nb max a b %
HC180Y	1.0922	0,01	0,3	0,7	0,06	0,025	0,01	0,12	
HC180P	1.0342	0,05	0,4	0,6	0,08	0,025	0,015		
HC180B	1.0395	0,05	0,5	0,7	0,06	0,025	0,015		
HC220Y	1.0925	0,01	0,3	0,9	0,08	0,025	0,01	0,12	
HC220I	1.0346	0,07	0,5	0,5	0,05	0,025	0,015	0,05	
HC220P	1.0397	0,07	0,5	0,7	0,08	0,025	0,015		
HC220B	1.0396	0,06	0,5	0,7	0,08	0,025	0,015		
HC260Y	1.0928	0,01	0,3	1,6	0,1	0,025	0,01	0,12	
HC260I	1.0349	0,07	0,5	0,5	0,05	0,025	0,015	0,05	
HC260P	1.0417	0,08	0,5	0,7	0,1	0,025	0,015		
HC260B	1.0400	0,08	0,5	0,7	0,1	0,025	0,015		
HC260LA	1.0480	0,1	0,5	0,6	0,025	0,025	0,015	0,15	
HC300I	1.0447	0,08	0,5	0,7	0,08	0,025	0,015	0,05	
HC300P	1.0448	0,1	0,5	0,7	0,12	0,025	0,015		
HC300B	1.0444	0,1	0,5	0,7	0,12	0,025	0,015		
HC300LA	1.0489	0,1	0,5	1,0	0,025	0,025	0,015	0,15	0,09
HC340LA	1.0548	0,1	0,5	1,0	0,025	0,025	0,015	0,15	0,09
HC380LA	1.0550	0,1	0,5	1,6	0,025	0,025	0,015	0,15	0,09
HC420LA	1.0556	0,1	0,5	1,6	0,025	0,025	0,015	0,15	0,09

^a These additional elements may be used individually or in combination where they appear in the definition of the steel within the composition limits indicated. Vanadium and boron may also be added. However, the sum of the contents of these four dispersoidal elements shall not exceed 0,22 %.

^b For all interstitial free (Y) grades, Nb may be added alternatively or in combination with Ti. For all grades containing "I" in its designation, Ti can be substituted by Nb or B.

5.4 Mechanical properties

The products shall comply with the requirements for transverse test pieces given in Table 2. By agreement, they may be delivered as suitable for making a particular part; in this case a maximum percentage of scrap may be agreed and acceptance on the basis of mechanical properties is not applicable.

The mechanical properties given in Table 2 and Table 3 are valid for a period of at least 6 months from the date on which the products are made available.

By agreement, special formability criteria can be defined between producer and purchaser.