SLOVENSKI STANDARD

SIST EN 10263-3:2018

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Nadomešča:

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Jekleni drogovi, palice in žica za hladno nakrčevanje in hladno iztiskanje - 3. del: Tehnični dobavni pogoji za cementirna jekla

Steel rod, bars and wire for cold heading and cold extrusion - Part 3: Technical delivery conditions for case hardening steels

Walzdraht, Stäbe und Draht aus Kaltstauch- und Kaltfließpressstählen - Teil 3: Technische Lieferbedingungen für Einsatzstähle

Barres, fil machine et fil en acier pour transformation à froid à froid et extrusion à froid - Partie 3: Conditions techniques de livraison des aciers de cémentation

Ta slovenski standard je istoveten z: **EN 10263-3:2017**

ICS:

77.140.60	Jeklene palice in drogovi	Steel bars and rods
77.140.65	Jeklene žice, jeklene vrvi in verige	Steel wire, wire ropes and link chains

SIST EN 10263-3:2018 **en,fr,de**

EUROPEAN STANDARD

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English Version

Steel rod, bars and wire for cold heading and cold extrusion - Part 3: Technical delivery conditions for case hardening steels

Barres, fil machine et fil en acier pour transformation à froid à froid et extrusion à froid - Partie 3: Conditions techniques de livraison des aciers de cémentation

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This European Standard was approved by CEN on 26 July 2017.

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European foreword

This document (EN 10263-3:2017) has been prepared by Technical Committee ECISS/TC 106 “Wire rod and wires”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by May 2018, and conflicting national standards shall be withdrawn at the latest by May 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 10263-3:2001.

This European Standard EN 10263 is subdivided as follows:

— *Part 1: General technical delivery conditions*

— *Part 2: Technical delivery conditions for steels not intended for heat treatment after cold working*

— *Part 3: Technical delivery conditions for case hardening steels*

— *Part 4: Technical delivery conditions for steels for quenching and tempering*

— *Part 5: Technical delivery conditions for stainless steels*

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1 Scope

1.1 This part of EN 10263 is applicable to round rod, round bars and wire with a diameter up to and including 100 mm, of non-alloy and alloy steel, intended for cold heading and cold extrusion and case hardening.

1.2 EN 10263-1:2017 is indispensable for this part of EN 10263.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

EN 10263-1:2017, *Steel rod, bars and wire for cold heading and cold extrusion — Part 1: General technical delivery conditions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 10263-1:2017 and the following apply.

3.1
case-hardening steels
structural steels with a relatively low carbon content, which are carburized or carbonitrided on their surface and subsequently hardened

Note 1 to entry: These steels, after hardening, have a high degree of hardness in the surface zone and good resistance to wear, while the core material is characterized principally by extreme toughness.

Note 2 to entry: Further possibilities for heat treatment of case-hardening steels are, for example, nitrocarburizing and nitriding.

4 Classification and Designation

4.1 Classification

All steels covered by this part of EN 10263 are special steels according to EN 10020.

Steel grades from C10E2C to C20E2C as quoted in Table 3 are non-alloy steels and all others are alloy steels according to EN 10020.

4.2 Designation

See EN 10263-1:2017.

5 Production process

5.1 Steelmaking process

See EN 10263-1:2017.

5.2 Deoxidation

All steels quoted in Table 3 shall be deoxidised.

6 Requirements

6.1 Delivery conditions

The delivery conditions in which the products covered by this part of EN 10263 are normally supplied, the product forms and the applicable requirements are given in Tables 1 and 2.

6.2 Chemical composition

6.2.1 Cast analysis

The chemical composition shall be in accordance with the values specified in Table 3 for the cast analysis.

6.2.2 Product analysis

In cases where a product analysis is requested, the admissible deviations from the values specified for the cast analysis are indicated in Table 4.

6.3 Mechanical properties

The mechanical properties of the products, to be determined by the tensile test or hardness test, shall be in accordance with Tables 5, 6 and 7 but by consideration of the prescriptions given in Table 1 and of the delivery conditions given in Table 2.

6.4 Hardenability

6.4.1 In the case of products ordered with standard requirements regarding hardenability, that is, when the steel names or numbers as quoted in Table 3 are supplemented by the symbols "+H", the hardness values obtained in the end quench test (Jominy test) (see Table 1 of EN 10263-1:2017) shall be in compliance with the values given in Table 8.

6.4.2 In the case of products ordered with restricted requirements regarding the scatter bands of the hardness values obtained by the Jominy test, that is when the steel name or number as quoted in Table 3 is supplemented by the symbol "+HH" or "+HL", the above hardness values shall be in compliance with the values given in Table 9.

NOTE 1 The symbol "+HH" denotes that the upper limit of the scatter band coincides with the upper limit for the corresponding steel "+H".

NOTE 2 The symbol "+HL" denotes that the lower limit of the scatter band coincides with the lower limit for the corresponding steel "+H".

NOTE 3 See EN 10263-1:2017, 7.7.4 and 10.2

6.4.3 The austenizing temperatures for the Jominy test are given in Tables 8 and 9.

6.5 Surface quality

For any particular surface requirement to be agreed at the time of ordering see EN 10263-1:2017, 7.10.

6.6 Supplementary or special requirements

Other requirements that can be agreed at the time of enquiry and order are described in Annex A of EN 10263-1:2017.

Table 1 — Combination of heat-treatment condition at delivery, product forms and applicable requirements

Heat-treatment condition at delivery	Symbol	Products form			Applicable requirements in cases where the steel concerned has been ordered with reference to the steel names indicated in					
		rod	bar	wire	Tables 3, 5 or 6 or 7		Tables 3,5 or 6 or 7,8 or 9			Table 3,5,6,7,8 or 9
untreated	None or +U	X	X	X	Chemical composition as specified in Tables 3 and 4	Mechanical properties as specified in Table 5 or 6 or 7	Chemical composition as specified in Tables 3 and 4	Mechanical properties as specified in Table 5 or 6 or 7	Values for hardenability according to Tables 8 or 9	Supplementary or special requirements as specified in Annex A of EN 10263-1:2017 [a]
spheroidized	+AC	X	X	X						
Treated to ferrite-pearlite structure and hardness range	+FP	–	X	–						
Others	Other delivery conditions may be agreed at the time of ordering									

Key
X = applicable
– = not applicable

a If agreed at the time of the enquiry and order.

Table 2 — Surface condition at delivery

Surface condition at delivery		Symbol	bar	rod	wire
Unless otherwise agreed	as rolled	none or +AR	x	x	–
Particular surface conditions supplied by agreement	cold drawn	+C	x	–	x
	skin passed	+LC	x	–	x
	peeled	+PE	x	x	x

Table 3 — Steel grades and chemical composition. Heat analysis % (by mass)

Steel grades		C	Si max. [a]	Mn	P max.	S	Cr	Mo	Ni	B	Cu max
Steel name	Steel number										
C10E2C	1.1122	0.08 to 0,12	0,30	0,30 to 0,60	0,025	0,025 max.					0,25
C15E2C	1.1132	0,13 to 0,17	0,30	0,30 to 0,60	0,025	0,025 max.					0,25
C17E2C	1.1147	0,15 to 0,19	0,30	0,60 to 0,90	0,025	0,025 max.					0,25
C20E2C	1.1152	0,18 to 0,22	0,30	0,30 to 0,60	0,025	0,025 max.					0,25
15B2	1.5501	0,13 to 0,16	0,30	0,60 to 0,80	0,025	0,025 max.				0,0008 to 0,005	0,25
18B2	1.5503	0,16 to 0,20	0,30	0,60 to 0,80	0,025	0,025 max.				0,0008 to 0,005	0,25
18MnB4	1.5521	0,16 to 0,20	0,30	0,90 to 1,20	0,025	0,025 max.				0,0008 to 0,005	0,25
22MnB4	1.5522	0,20 to 0,24	0,30	0,90 to 1,20	0,025	0,025 max.				0,0008 to 0,005	0,25
17Cr3	1.7016	0,14 to 0,20	0,30	0,60 to 0,90	0,025	0,025 max.	0,70 to 1,00				0,25
17CrS3	1.7014	0,14 to 0,20	0,30	0,60 to 0,90	0,025	0,020 to 0,040	0,70 to 1,00				0,25

Steel grades		C	Si max. [a]	Mn	P max.	S	Cr	Mo	Ni	B	Cu max
Steel name	Steel number										
16MnCr5	1.7131	0,14 to 0,19	0,30	1,00 to 1,30	0,025	0,025 max.	0,80 to 1,10			0,0008 to 0,005	0,25
16MnCrS5	1.7139	0,14 to 0,19	0,30	1,00 to 1,30	0,025	0,020 to 0,040	0,80 to 1,10				0,25
16MnCrB5	1.7160	0,14 to 0,19	0,30	1,00 to 1,30	0,025	0,025 max.	0,80 to 1,10				0,25
20MnCrS5	1.7149	0,17 to 0,22	0,30	1,10 to 1,40	0,025	0,020 to 0,040	1,00 to 1,30				0,25
12CrMo4	1.7201	0,10 to 0,15	0,30	0,60 to 0,90	0,025	0,025 max.	0,90 to 1,20	0,15 to 0,25			0,25
18CrMo4	1.7243	0,15 to 0,21	0,30	0,60 to 0,90	0,025	0,025 max.	0,90 to 1,20	0,15 to 0,25			0,25
18CrMoS4	1.7244	0,15 to 0,21	0,30	0,60 to 0,90	0,025	0,020 to 0,040	0,90 to 1,20	0,15 to 0,25			0,25
20MoCr4	1.7321	0,17 to 0,23	0,30	0,70 to 1,00	0,025	0,025 max.	0,30 to 0,60	0,40 to 0,50			0,25
20MoCrS4	1.7323	0,17 to 0,23	0,30	0,70 to 1,00	0,025	0,020 to 0,040	0,30 to 0,60	0,40 to 0,50			0,25
10NiCr5–4	1.5805	0,07 to 0,12	0,30	0,60 to 0,90	0,025	0,025 max.	0,90 to 1,20		1,20 to 1,50		0,25
12NiCr3–2	1.5701	0,09 to 0,15	0,30	0,30 to 0,60	0,025	0,025 max.	0,40 to 0,70		0,50 to 0,80		0,25
17CrNi6–6	1.5918	0,14 to 0,20	0,30	0,50 to 0,90	0,025	0,025 max.	1,40 to 1,70		1,40 to 1,70		0,25
20NiCrMo2–2	1.6523	0,17 to 0,23	0,30	0,65 to 0,95	0,025	0,025 max.	0,35 to 0,70	0,15 to 0,25	0,40 to 0,70		0,25
20NiCrMoS2–2	1.6526	0,17 to 0,23	0,30	0,65 to 0,95	0,025	0,020 to 0,040	0,35 to 0,70	0,15 to 0,25	0,40 to 0,70		0,25
20NiCrMoS6–4	1.6571	0,16 to 0,23	0,30	0,50 to 0,90	0,025	0,020 to 0,040	0,60 to 0,90	0,25 to 0,35	1,40 to 1,70		0,25

a A lower silicon content or a specific silicon range may be agreed at the time of ordering.

NOTE 1 Elements not quoted in this table should not be intentionally added to the steel without the agreement of the purchaser, except those intended for finishing the heat. All reasonable precautions shall be taken in order to prevent the addition of such elements from scrap or other materials used in the production process, which may affect the hardenability, mechanical properties and applicability.

NOTE 2 In the case of steels with hardenability requirements (see Tables 8 and 9) minor deviation from the specified limits are permitted (with the exception of sulphur and phosphorus), provided that they do not exceed 0,01 % for carbon and the values indicated in Table 4 for the other elements.

NOTE 3 To improve the performance of cold heading, it is possible to add Aluminium Al: 0,020 % to 0,050 %.