

SLOVENSKI STANDARD oSIST prEN 10250-3:2021

01-januar-2021

Prosto kovani jekleni izkovki za splošno tehnično uporabo - 3. del: Legirana plemenita jekla

Open die steel forgings for general engineering purposes - Part 3: Alloy special steels

Freiformschmiedestücke aus Stahl für allgemeine Verwendung - Teil 3: Legierte Edelstähle

iTeh STANDARD PREVIEW

Pièces forgées en acier pour usage général - Partie 3: Aciers spéciaux alliés
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ICS:

77.140.20	Visokokakovostna jekla	Stainless steels
77.140.85	Železni in jekleni kovani izdelki	Iron and steel forgings

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en,fr,de

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**EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM**

**DRAFT
prEN 10250-3**

November 2020

ICS 77.140.20; 77.140.85

Will supersede EN 10250-3:1999

English Version

**Open die steel forgings for general engineering purposes -
Part 3: Alloy special steels**

Pièces forgées en acier pour usage général - Partie 3:
Aciers spéciaux alliés

Freiformschmiedestücke aus Stahl für allgemeine
Verwendung - Teil 3: Legierte Edelstähle

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 459/SC 11.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 10250-3:2020) has been prepared by Technical Committee CEN/TC 459 "Steel castings and forgings", the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 10250-3:1999.

In comparison with the previous edition, the following technical modifications have been made:

- updating of normative references.

EN 10250, *Open die steel forgings for general engineering purposes*, consists of the following parts:

- *Part 1: General requirements;*
- *Part 2: Non-alloy quality and special steels;*
- *Part 3: Alloy special steels;*
- *Part 4: Stainless steels.*

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prEN 10250-3:2020 (E)

1 Scope

This document specifies the technical delivery requirements for open die forgings, forged bars and products pre-forged and finished in ring rolling mills, manufactured from alloy special steel and supplied in the quenched and tempered condition.

The majority of steels listed in this document are identical to steels specified in EN ISO 683-1 and EN ISO 683-2 and more extensive information on hardenability and technological properties is given in these standards.

General information on technical delivery conditions is given in EN 10021.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

prEN 10250-1:2020, *Open die steel forgings for general engineering purposes - Part 1: General requirements*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

4 Chemical composition

4.1 Cast analysis

The chemical composition of the steel shall be determined by cast analysis and shall conform to the analysis given in Table 1 (see A.7 and A.8 of prEN 10250-1:2020).

Measures should be taken to prevent the addition from the scrap, or other material used in the manufacture of the steels, of such elements which affect the hardenability, mechanical properties and applicability of the steel.

4.2 Product analysis

The product analysis shall not deviate from the specified cast analysis (see Table 1) by more than the values specified in Table 2 (see 9.2 of prEN 10250-1:2020).

5 Heat treatment

Heat treatment details are given in Annex A, Table A.1 for guidance.

6 Mechanical properties

The mechanical properties determined on test pieces selected, prepared and tested in accordance with Clauses 11 and 12 of prEN 10250-1:2020 shall conform to the property requirements given in Table 3.

Table 1 — Steel grades and chemical composition^a

Name	Number	C %	Si %	Mn %	P max %	S max %	Cr %	Mo %	Ni %	V %
38Cr2	1.7003	0,35 to 0,42	≤ 0,40	0,50 to 0,80	0,035	0,035	0,40 to 0,60	-	-	-
46Cr2	1.7006	0,42 to 0,50	≤ 0,40	0,50 to 0,80	0,035	0,035	0,40 to 0,60	-	-	-
34Cr4	1.7033	0,30 to 0,37	≤ 0,40	0,60 to 0,90	0,035	0,035	0,90 to 1,20	-	-	-
37Cr4	1.7034	0,34 to 0,41	≤ 0,40	0,60 to 0,90	0,035	0,035	0,90 to 1,20	-	-	-
41Cr4	1.7035	0,38 to 0,45	≤ 0,40	0,60 to 0,90	0,035	0,035	0,90 to 1,20	-	-	-
25CrMo4	1.7218 https://standards.iteh.ai/catalog/standards/sist/1cc03feb-723549e8a3f56fb58/osist-pren-10250-3-2021	0,22 to 0,29	≤ 0,40	0,60 to 0,90	0,035	0,035	0,90 to 1,20	0,15 to 0,30	-	-
34CrMo4	1.7220	0,30 to 0,37	≤ 0,40	0,60 to 0,90	0,035	0,035	0,90 to 1,20	0,15 to 0,30	-	-
42CrMo4	1.7225	0,38 to 0,45	≤ 0,40	0,60 to 0,90	0,035	0,035	0,90 to 1,20	0,15 to 0,30	-	-
50CrMo4	1.7228	0,46 to 0,54	≤ 0,40	0,50 to 0,80	0,035	0,035	0,90 to 1,20	0,15 to 0,30	-	-
36CrNiMo4	1.6511	0,32 to 0,40	≤ 0,40	0,50 to 0,80	0,035	0,035	0,90 to 1,20	0,15 to 0,30	0,90 to 1,20	-
34CrNiMo6	1.6582	0,30 to 0,38	≤ 0,40	0,50 to 0,80	0,035	0,035	1,30 to 1,70	0,15 to 0,30	1,30 to 1,70	-

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		C	Si	Mn	P max %	S max %	Cr	Mo	Ni	V
Name		%	%	%	%	%	%	%	%	%
30CrNiMo8	1.6580	0,26 to 0,34	≤ 0,40	0,30 to 0,60	0,035	0,035	1,80 to 2,20	0,30 to 0,50	1,80 to 2,20	-
36NiCrMo16	1.6773	0,32 to 0,39	≤ 0,40	0,30 to 0,60	0,030	0,025	1,60 to 2,00	0,25 to 0,45	3,60 to 4,10	-
51CrV4	1.8159	0,47 to 0,55	≤ 0,40	0,70 to 1,10	0,035	0,035	0,90 to 1,20	-	-	0,10 to 0,25
33NiCrMoV14-5	1.6956	0,28 to 0,38	≤ 0,40	0,15 to 0,40	0,035	0,035	1,00 to 1,70	0,30 to 0,60	2,90 to 3,80	0,08 to 0,25
40CrMoV13-9	1.8523	0,35 to 0,45	0,15 to 0,40	0,40 to 0,70	0,035	0,035	3,00 to 3,50	0,80 to 1,10	-	0,15 to 0,25
18CrMo4	1.7243	0,15 to 0,21	≤ 0,40	0,60 to 0,90 ^a	0,035	0,035	0,90 to 1,20	0,15 to 0,25	-	-
20MnMoNi4-5	e8a2f5fb58/osist-pren-10250-3:2021	0,17 to 0,23	≤ 0,40	1,00 to 1,50	0,035	0,035	≤ 0,50	0,45 to 0,60	0,40 to 0,80 ^b	-
30CrMoV9	1.7707	0,26 to 0,34	≤ 0,40	0,40 to 0,70	0,035	0,035	2,30 to 2,70	0,15 to 0,25	≤ 0,60	0,10 to 0,20
32CrMo12	1.7361	0,28 to 0,35	≤ 0,40	0,40 to 0,70	0,035	0,035	2,80 to 3,30	0,30 to 0,50	≤ 0,60	-
28NiCrMoV8-5	1.6932	0,24 to 0,32	≤ 0,40	0,15 to 0,40	0,035	0,035	1,00 to 1,50	0,35 to 0,55	1,80 to 2,10	0,05 to 0,15

^a At the option of the manufacturer the elements aluminium, titanium, vanadium and niobium may be added singly or in combination for grain control purposes. Elements not quoted in Tables 1 and 2 shall not be added intentionally to the steel without the agreement of the purchaser, except for the purpose of finishing the heat.

^b For greater cross-sections up to 1,00 % Ni is admissible.

Table 2 — Permissible deviations between the product analysis and the limiting values given in Table 1 for the cast analysis

Element	Permissible maximum content in the cast analysis %	Permissible deviation %
Carbon	≤ 0,55	± 0,02
Silicon ^a	≤ 0,40	+ 0,03
Manganese	≤ 1,00 > 1,00 ≤ 1,50	± 0,04 ± 0,06
Phosphorus	≤ 0,035	+ 0,005
Sulphur	≤ 0,045	+ 0,005
Chromium	≤ 2,00 > 2,00 ≤ 3,50	± 0,05 ± 0,12
Molybdenum	≤ 0,30 > 0,30 ≤ 1,10	± 0,03 ± 0,06
Nickel	≤ 2,00 > 2,00 ≤ 4,10	± 0,05 ± 0,07
Vanadium	≤ 0,25	± 0,02

^a For steel 40 Cr Mo V13 9, the permissible deviation is ± 0,03 %.

Table 3 — Mechanical properties in the quenched and tempered condition

Steel designation		Thickness of ruling section t_R																	
		$t_R \leq 160$ mm				$160 < t_R \leq 330$ mm				$330 < t_R \leq 660$ mm ^b									
Name	Number	R_e min N/mm ²	R_m min N/mm ²	A min %		KV min J		R_e min N/mm ²	R_m min N/mm ²	A min %		KV min J		R_e min N/mm ²	R_m min N/mm ²	A min %		KV min J	
				l^a	t_r^a	l^a	t_r^a			l^a	t_r^a	l^a	t_r^a			l^a	t_r^a	l^a	t_r^a
42CrMo4	1.7225	500	750	14	10	30	16	460	700	15	11	27	14	390	600	16	12	22	12
50CrMo4	1.7228	550	800	13	9	25	14	540	750	14	10	20	12	490	700	15	11	15	10
36CrNiMo4	1.6511	550	750	14	10	45	22	500	700	15	11	45	22	450	650	16	12	40	20
34CrNiMo6	1.6582	600	800	13	9	45	22	540	750	14	10	45	22	490	700	15	11	40	20
30NiCrMo8	1.6580	700	900	12	8	45	22	630	850	12	8	45	22	590	800	12	8	40	20
36NiCrMo16	1.6773	800	1000	11	8	45	22	800	1000	11	8	45	22	800	1000	11	8	45	22
51CrV4	1.8159	600	800	13	9	30	16	-	-	-	-	-	-	-	-	-	-	-	-
33NiCrMoV14-5	1.6956	980	1100	10	7	28	17	820	1000	12	8	48	27	780	950	12	8	48	27
40CrMoV13-9	1.8523	660	850	15	15	35	35	660	850	15	15	40	35	660	850	15	15	35	35
		720	900	15	15	32	32	720	900	15	15	32	32	720	900	15	15	32	32
		780	950	14	14	30	30	780	950	14	14	30	30	780	950	14	14	30	30
		840	1000	12	12	25	25	840	1000	12	12	25	25	-	-	-	-	-	-
		890	1050	11	11	22	22	-	-	-	-	-	-	-	-	-	-	-	-
		940	1100	11	11	20	20	-	-	-	-	-	-	-	-	-	-	-	-
18CrMo4	1.7243	275 ($R_p 0,2$)	485-660	20	20	50	50	-	-	-	-	-	-	-	-	-	-	-	-
20MnMoNi4-5	1.6311	420	580	17	14	39	24	390	550	17	14	39	24	-	-	-	-	-	-
30CrMoV9	1.7707	700	900	12	8	35	20	590	800	14	10	35	20	-	-	-	-	-	-
32CrMo12	1.7361	680	900	12	8	35	20	630	850	13	9	35	20	490	700	15	11	35	20
28NiCrMoV8-5	1.6932	630	800	14	10	45	25	590	750	15	11	40	21	590	750	15	11	40	21

^a l = longitudinal t_r = transverse^b For steels 42 CrMo 4, 50 CrMo 4, 36 CrNiMo 4 these properties apply only to a $t_R \leq 500$ mm.