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Rostfria stål – Del 1: Förteckning över rostfria stål

Stainless steels – Part 1: List of stainless steels

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Denna standard ersätter SS-EN 10088-1:2005, utgåva 2.

The European Standard EN 10088-1:2014 has the status of a Swedish Standard. This document contains the official version of EN 10088-1:2014.

This standard supersedes the Swedish Standard SS-EN 10088-1:2005, edition 2.

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EUROPEAN STANDARD

EN 10088-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2014

ICS 77.140.20

Supersedes EN 10088-1:2005

English Version

Stainless steels - Part 1: List of stainless steels

Aciers inoxydables - Partie 1: Liste des aciers inoxydables

Nichtrostende Stähle - Teil 1: Verzeichnis der nichtrostenden Stähle

This European Standard was approved by CEN on 9 August 2014.

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

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Foreword

This document (EN 10088-1:2014) has been prepared by Technical Committee ECISS/TC 105 "Steels for heat treatment, alloy steels, free-cutting and stainless steels", 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of an identical text or by endorsement, at the latest by April 2015 and conflicting national standards shall be withdrawn at the latest by April 2015.

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

This document supersedes EN 10088-1:2005.

This document mainly differs from the 2005 edition as follows:

- a) addition of austenitic grades 1.4615 (also part 3), 1.4618 (2), 1.4376 (2), 1.4640 (2), 1.4646 (2, 3), 1.4020 (3), 1.4378 (3), addition of austenitic-ferritic (duplex) grades 1.4162 (2, 3), 1.4662 (2, 3), 1.4658 (3), 1.4482 (2, 3), 1.4062 (2, 3), 1.4669 (3), addition of ferritic grades 1.4621 (2), 1.4600 (2), 1.4607 (2), 1.4611 (2, 3), 1.4613 (2, 3), 1.4630 (2), 1.4634 (2), addition of martensitic grade 1.4150 (3), addition of precipitation hardening grade 1.4612 (3);
- b) chemical composition was changed for following grades: austenitic grade 1.4371, 1.4597, austenitic-ferritic grade 1.4362.

Each of the tables for the chemical composition of steel grades now has a sub-section with grades designated as 'uncommon' (i.e. not produced in the past 10 years and which may be removed during the next revision).

EN 10088, under the general title *Stainless steels*, consists of the following parts:

- *Part 1: List of stainless steels* (including a table of European Standards, in which these stainless steels are further specified, see Annex B) [the present document];
- *Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes;*
- *Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes;*
- *Part 4: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for construction purposes;*
- *Part 5: Technical delivery conditions for bars, rods, wire, sections and bright products of corrosion resisting steels for construction purposes.*

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

Introduction

The European Organization for Standardization (CEN) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents applied to ten steel grades.

CEN takes no position concerning the evidence, validity and scope of these patent rights.

The holder of these patent rights has ensured CEN that they are willing to negotiate licences, under reasonable and non-discriminatory terms and conditions, with applicants throughout the world. In this respect, the statements of the holders of these patent rights are registered with CEN. Information may be obtained from:

Grade 1.4658
Sandvik AB
SE-81181 Sandviken, Sweden

Grade 1.4162, 14662
Outokumpu Stainless AB
SE-77480 Avesta, Sweden

Grade 1.4062, 1.4615, 1.4669
Ugitech
F-73403 Ugine Cedex, France

Grade 1.4062, 1.4669
Industeel
F-71200 Creusot, 56 Rue Clemenceau, France

Grade 1.4646, 1.4611, 1.4613
Acciai Speciali Terni
I-05100 Terni, Italy

1 Scope

This European Standard lists the chemical composition of stainless steels, which are subdivided in accordance with their main properties into corrosion resisting steels, heat resisting steels and creep resisting steels and specified in the European Standards given in Table 1.

Table 1 — Overview of material standards for stainless steels

Stainless steels		
Corrosion resisting steels	Heat resisting steels	Creep resisting steels
EN 10028-7		EN 10028-7
EN 10088-2		
EN 10088-3		
EN 10088-4		
EN 10088-5		
	EN 10095	
EN 10151		
EN 10216-5		EN 10216-5
EN 10217-7		
EN 10222-5		EN 10222-5
EN 10250-4		
EN 10263-5		
EN 10264-4	EN 10264-4	
EN 10269		EN 10269
EN 10270-3		
EN 10272		
EN 10296-2		
EN 10297-2		
		EN 10302
EN 10312		

Reference data on some physical properties are given in Tables E.1 to E.8.

NOTE 1 A matrix that shows which steels are included in which standard is given in Annex B.

NOTE 2 Valve steels are specified in EN 10090.

NOTE 3 Steel castings are specified in various European Standards (see Bibliography).

NOTE 4 Tool steels are specified in EN ISO 4957.

NOTE 5 Welding consumables are specified in various European Standards (see Bibliography).

2 Normative references

The following referenced 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 10079:2007, *Definition of steel products*

3 Terms and definitions

For the purposes of this document, the terms and definitions for the product forms given in EN 10079:2007 and the following apply.

3.1

stainless steels

steels with at least 10,5 % of chromium and maximum 1,2 % of carbon

[SOURCE: EN 10020:2000, 3.2.2]

Note 1 to entry: Stainless steels are further subdivided in accordance with their main property into corrosion resisting steels, heat resisting steels and creep resisting steels.

Note 2 to entry: One type of steel in Table 7 and five types of steel in Table 9 contain less chromium than the minimum defined for stainless steels, but are included in the heat-resisting and creep-resisting steels standards respectively, because they form a part of these two families of steels.

4 Chemical composition

The chemical composition of stainless steels is given:

- in Table 2 for austenitic corrosion resisting steels;
- in Table 3 for austenitic-ferritic corrosion resisting steels;
- in Table 4 for ferritic corrosion resisting steels;
- in Table 5 for martensitic and precipitation hardening corrosion resisting steels;
- in Table 6 for austenitic and austenitic-ferritic heat resisting steels;
- in Table 7 for ferritic heat resisting steels;
- in Table 8 for austenitic creep resisting steels;
- in Table 9 for martensitic creep resisting steels.

NOTE 1 The steel grades marked in Tables 2 to 9 as uncommon grades will be rechecked during the next revision and it will be decided whether to delete these steel grades or not.

NOTE 2 The chemical composition of nickel and cobalt alloys listed in EN 10095, EN 10269 and EN 10302 is given in Tables F.1 and F.2.

Table 2 — Chemical composition (cast analysis) of austenitic corrosion resisting steels

Steel designation		% by mass ^a										
Name	Number	C	Si	Mn	P	S	Cr	Mo	Ni	N	Cu ^c	Others
Austenitic steels												
X2CrNiN18-7	1.4318	0,030	1,00	2,00	0,045	0,015	16,5 to 18,5	-	6,0 to 8,0	0,10 to 0,20	-	-
X10CrNi18-8	1.4310	0,05 to 0,15	2,00	2,00	0,045	0,015	16,0 to 19,0	0,80	6,0 to 9,5	0,10	-	-
X2CrNi18-9	1.4307	0,030	1,00	2,00	0,045	0,015 ^b	17,5 to 19,5	-	8,0 to 10,5	0,10	-	-
X9CrNi18-9	1.4325	0,03 to 0,15	1,00	2,00	0,045	0,030	17,0 to 19,0	-	8,0 to 10,0	-	-	-
X8CrNiS18-9 ^e	1.4305 ^e	0,10	1,00	2,00	0,045	0,15 to 0,35	17,0 to 19,0	-	8,0 to 10,0	0,10	1,00	-
X6CrNiCuS18-9-2 ^e	1.4570 ^e	0,08	1,00	2,00	0,045	0,15 to 0,35	17,0 to 19,0	0,60	8,0 to 10,0	0,10	1,40 to 1,80	-
X3CrNiCu18-9-4	1.4567	0,04	1,00	2,00	0,045	0,015 ^b	17,0 to 19,0	-	8,5 to 10,5	0,10	3,0 to 4,0	-
X5CrNiN19-9	1.4315	0,06	1,00	2,00	0,045	0,015	18,0 to 20,0	-	8,0 to 11,0	0,12 to 0,22	-	-
X3CrNiCu19-9-2	1.4560	0,035	1,00	1,50 to 2,00	0,045	0,015	18,0 to 19,0	-	8,0 to 9,0	0,10	1,50 to 2,00	-
X5CrNiCu19-6-2	1.4640	0,030 to 0,08	0,50	1,50 to 4,0	0,045	0,015	18,0 to 19,0	-	5,5 to 6,9	0,03 to 0,11	1,30 to 2,00	-
X2CrNiN18-10	1.4311	0,030	1,00	2,00	0,045	0,015 ^b	17,5 to 19,5	-	8,5 to 11,5	0,12 to 0,22	-	-
X5CrNi18-10	1.4301	0,07	1,00	2,00	0,045	0,015 ^b	17,5 to 19,5	-	8,0 to 10,5	0,10	-	-
X6CrNiTi18-10	1.4541	0,08	1,00	2,00	0,045	0,015 ^b	17,0 to 19,0	-	9,0 to 12,0 ^d	-	-	Ti:5xC to 0,70
X6CrNiNb18-10	1.4550	0,08	1,00	2,00	0,045	0,015	17,0 to 19,0	-	9,0 to 12,0 ^d	-	-	Nb: 10xC to 1,00
X2CrNiCu19-10	1.4650	0,030	1,00	2,00	0,045	0,015	18,5 to 20,0	-	9,0 to 10,0	0,08	1,00	-
X2CrNi19-11	1.4306	0,030	1,00	2,00	0,045	0,015 ^b	18,0 to 20,0	-	10,0 to 12,0 ^d	0,10	-	-
X4CrNi18-12	1.4303	0,06	1,00	2,00	0,045	0,015 ^b	17,0 to 19,0	-	11,0 to 13,0	0,10	-	-
X1CrNiSi18-15-4	1.4361	0,015	3,7 to 4,5	2,00	0,025	0,010	16,5 to 18,5	0,20	14,0 to 16,0	0,10	-	-
X8CrMnCuN17-8-3	1.4597	0,10	2,00	6,5 to 9,0	0,040	0,030	15,0 to 18,0	1,00	3,00	0,10 to 0,30	2,00 to 3,5	-
X8CrMnNi19-6-3	1.4376	0,10	1,00	5,0 to 8,0	0,045	0,015	17,0 to 20,5	-	2,00 to 4,5	0,30	-	-
X3CrMnNiCu15-8-5-3 ¹⁾	1.4615 ¹⁾	0,030	1,00	7,0 to 9,0	0,040	0,010	14,0 to 16,0	0,80	4,5 to 6,0	0,02 to 0,06	2,0 to 4,0	-
X12CrMnNiN17-7-5	1.4372	0,15 ^f	1,00	5,5 to 7,5	0,045	0,015	16,0 to 18,0	-	3,5 to 5,5	0,05 to 0,25	-	-