



SLOVENSKI STANDARD

SIST EN 12070:2000

01-maj-2000

Dodajni materiali za varjenje - Zice in palice za oblocno varjenje jekel, odpornih proti lezenju - Razvrstitev

Welding consumables - Wire electrodes, wires and rods for arc welding of creep-resisting steels - Classification

Schweißzusätze - Drahtelektroden, Drähte und Stäbe zum Lichtbogenschweißen von warmfesten Stählen - Einteilung

Produits consommables pour le soudage - Fils-électrodes, fils d'apport et baguettes d'apport pour le soudage a l'arc des aciers résistant au fluage - Classification

<https://standards.iteh.ai/catalog/standards/sist/5dd5ff52-58bf-4678-b9c8-f1073271922a/sist-en-12070-2000>

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ICS:

25.160.20 Potrošni material pri varjenju Welding consumables

SIST EN 12070:2000

en

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EUROPEAN STANDARD

EN 12070

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 1999

ICS 25.160.20

English version

Welding consumables - Wire electrodes, wires and rods for arc welding of creep-resisting steels - Classification

Produits consommables pour le soudage - Fils-électrodes, fils d'apport et baguettes d'apport pour le soudage à l'arc des aciers résistant au fluage - Classification

Schweißzusätze - Drahtelektroden, Drähte und Stäbe zum Lichtbogenschweißen von warmfesten Stählen - Einteilung

This European Standard was approved by CEN on 3 September 1999.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DS.

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 2000, and conflicting national standards shall be withdrawn at the latest by April 2000.

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.

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Introduction

For creep-resisting steel welding consumables it should be noted that the mechanical properties of all-weld metal test specimens used for classification will vary from those obtained in production joints because of differences in welding conditions, material composition and shielding gas or flux.

Although combinations of wires and fluxes supplied by individual companies can have the same grading, the individual wires and fluxes from different companies are not interchangeable unless verified in accordance with this standard.

1 Scope

This standard specifies requirements for classification of wire electrodes, wires and rods for gas tungsten arc welding, gas shielded metal arc welding and submerged arc welding of creep-resisting and low alloy elevated temperature steels. The classification of the wire electrodes, wires and rods is based on their chemical composition.

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.

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EN 759 Welding consumables - Technical delivery conditions for welding filler metals - Type of product, dimensions, tolerances and marking

EN 1597-1 Welding consumables - Test methods - Part 1: Test piece for all-weld metal test specimens in steel, nickel and nickel alloys

EN ISO 13916 Welding - Guidance on the measurement of preheating temperature, interpass temperature and preheat maintenance temperature (ISO 13916:1996)

ISO 31-0:1992 Quantities and units - Part 0: General principles

3 Classification

A wire electrode, wire or rod is classified in accordance with its chemical composition in table 1.

When the wire electrode, wire or rod is classified in combination with a gas or flux for welding the classification shall be prefixed with a symbol in accordance with clause 4 as appropriate.

As a consequence the classification is divided into two parts:

- a) the first part gives a symbol indicating the product/process to be identified;
- b) the second part gives a symbol indicating the chemical composition of the wire electrode, wire or rod.

4 Symbols and requirements

4.1 Symbol for the product/process

The symbol for the wire electrode, wire or rod used in the arc welding process shall be the letter G (gas shielded metal arc welding), S (submerged arc welding) and/or W (gas tungsten arc welding).

The all-weld metal deposited in combination with a shielding gas or a flux shall meet the requirements in table 2.

4.2 Symbol for the chemical composition of wire electrodes, wires and rods

The symbol in table 1 indicates the chemical composition of the wire electrode, wire and rod determined under conditions given in clause 6.

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**Table 1: Symbols for the chemical composition
of wire electrodes, wires and rods**

Alloy symbols	Chemical composition in % (m/m) ¹⁾²⁾³⁾								
	C	Si	Mn	P	S	Cr	Mo	V	Other elements
Mo	0,08 to 0,15	0,05 to 0,25	0,80 to 1,20	0,025	0,025	-	0,45 to 0,65	-	-
MoSi	0,08 to 0,15	0,50 to 0,80	0,70 to 1,30	0,020	0,020	-	0,40 to 0,60	-	-
MnMo	0,08 to 0,15	0,05 to 0,25	1,30 to 1,70	0,025	0,025	-	0,45 to 0,65	-	-
MoV	0,08 to 0,15	0,10 to 0,30	0,60 to 1,00	0,020	0,020	0,30 to 0,60	0,50 to 1,00	0,25 to 0,45	-
MoVSi	0,06 to 0,15	0,40 to 0,70	0,70 to 1,10	0,020	0,020	0,30 to 0,60	0,50 to 1,00	0,20 to 0,40	-
CrMo1	0,08 to 0,15	0,05 to 0,25	0,60 to 1,00	0,020	0,020	0,90 to 1,30	0,40 to 0,65	-	-
CrMo1Si	0,08 to 0,14	0,50 to 0,80	0,80 to 1,20	0,020	0,020	0,90 to 1,30	0,40 to 0,65	-	-
CrMoV1	0,08 to 0,15	0,05 to 0,25	0,80 to 1,20	0,020	0,020	0,90 to 1,30	0,90 to 1,30	0,10 to 0,35	-
CrMoV1Si	0,06 to 0,15	0,50 to 0,80	0,80 to 1,20	0,020	0,020	0,90 to 1,30	0,90 to 1,30	0,10 to 0,35	-
CrMo2	0,08 to 0,15	0,05 to 0,25	0,30 to 0,70	0,020	0,020	2,2 to 2,8	0,90 to 1,15	-	-
CrMo2Si	0,04 to 0,12	0,50 to 0,80	0,80 to 1,20	0,020	0,020	2,3 to 3,0	0,90 to 1,20	-	-
CrMo2Mn ⁴⁾	0,10	0,50	0,50 to 1,20	0,020	0,015	2,0 to 2,5	0,90 to 1,20	-	-
CrMo2L	0,05	0,05 to 0,25	0,30 to 0,70	0,020	0,020	2,2 to 2,8	0,90 to 1,15	-	-
CrMo2LSi	0,05	0,50 to 0,80	0,80 to 1,20	0,020	0,020	2,3 to 3,0	0,90 to 1,20	-	-
CrMo5	0,03 to 0,10	0,20 to 0,50	0,40 to 0,75	0,020	0,020	5,5 to 6,5	0,50 to 0,80	-	-
CrMo5Si	0,03 to 0,10	0,30 to 0,60	0,30 to 0,70	0,020	0,020	5,5 to 6,5	0,50 to 0,80	-	-
CrMo9	0,06 to 0,10	0,30 to 0,60	0,30 to 0,70	0,025	0,025	8,5 to 10,0	0,80 to 1,20	0,15	Ni 1,0
CrMo9Si	0,03 to 0,10	0,40 to 0,80	0,40 to 0,80	0,020	0,020	8,5 to 10,0	0,80 to 1,20	-	-
CrMo91	0,07 to 0,15	0,60	0,4 to 1,5	0,020	0,020	8,0 to 10,5	0,80 to 1,20	0,15 to 0,30	Ni 0,4 to 1,0 Nb 0,03 to 0,10 N 0,02 to 0,07 Cu 0,25
CrMoWV12	0,22 to 0,30	0,05 to 0,40	0,40 to 1,20	0,025	0,020	10,5 to 12,5	0,80 to 1,20	0,20 to 0,40	Ni 0,8 W 0,35 to 0,80
CrMoWV12Si	0,17 to 0,24	0,20 to 0,60	0,40 to 1,00	0,025	0,020	10,5 to 12,0	0,80 to 1,20	0,20 to 0,40	Ni 0,8 W 0,35 to 0,80
Z	Any other agreed composition								

1) If not specified: Ni < 0,3, Cu < 0,3, V < 0,03, Nb < 0,01, Cr < 0,2.
2) Single values shown in the table are maximum values.
3) The results shall be rounded to the same number of significant figures as in the specified value using the rules in accordance with annex B, Rule A of ISO 31-0:1992.
4) A Mn/Si ratio of > 2,0 is desirable.

Table 2: Mechanical properties of all-weld metal

Alloy Symbols	Minimum proof strength $R_{p0.2}$ N/mm ²	Minimum tensile strength R_m N/mm ²	Minimum ¹⁾ elongation A %	Impact energy K_V (J) at +20°C		Heat treatment of all-weld metal			
				Minimum average from three test specimens	Minimum single value	Preheat and interpass temperature °C	Post weld heat treatment of test assembly	Time ⁴⁾ in min	
Mo/MoSi	355	510	22	47	38	< 200	none	-	
MnMo	355	510	22	47	38	< 200	none	-	
MoV/MoVSi	355	510	18	47	38	200 to 300	690 to 730	60	
CrMo1/ CrMo1Si	355	510	20	47	38	150 to 250	660 to 700	60	
CrMoV1/ CrMoV1Si	435	590	15	24	21	200 to 300	680 to 730	60	
CrMo2/ CrMo2Si/ CrMo2Mn	400	500	18	47	38	200 to 300	690 to 750	60	
CrMo2L/ CrMo2LSi	400	500	18	47	38	200 to 300	690 to 750	60	
CrMo5/ CrMo5Si	400	590	17	47	38	200 to 300	730 to 760	60	
CrMo9/ CrMo9Si	435	590	18	34	27	200 to 300	740 to 780	120	
CrMo91	415	585	17	47	38	250 to 350	750 to 760	180	
CrMoWV12/ CrMoWV12Si	550	690	15	34	27	250 to 350 ⁵⁾ or 400 to 500 ⁵⁾	740 to 780	120	
Z	Any other agreed mechanical properties								

1) Gauge length is equal to five times the test specimen diameter.

2) Only one single value lower than minimum average is permitted.

3) The test piece shall be cooled in the furnace to 300°C at a rate not exceeding 200°C/h.

4) Tolerance \pm 10 min.

5) Immediately after welding the test specimen shall be cooled down to 120°C to 100°C and kept at this temperature for at least 1 h.