



# SLOVENSKI STANDARD

## SIST EN 757:1999

01-junij-1999

---

### Razvrstitev oplaščenih elektrod za ročno obločno varjenje visokotrdnih jekel

Welding consumables - Covered electrodes for manual metal arc welding of high strength steels - Classification

Schweißzusätze - Umhüllte Stabelektroden zum Lichtbogenhandschweißen von hochfesten Stählen - Einteilung

Produits consommables pour le soudage - Electrodes enrobées pour le soudage manuel à l'arc des aciers à haute résistance - Classification

iTeh STANDARD PREVIEW

(standards.itteh.ai)

[SIST EN 757:1999](https://standards.itteh.ai/catalog/standards/sist/378ca643-b42d-4d9b-b682-705c7a49a67a/sist-en-757-1999)

Ta slovenski standard je istoveten z: **EN 757:1997**

<https://standards.itteh.ai/catalog/standards/sist/378ca643-b42d-4d9b-b682-705c7a49a67a/sist-en-757-1999>

---

#### **ICS:**

25.160.20      Potrošni material pri varjenju      Welding consumables

**SIST EN 757:1999**

**de**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 757:1999

<https://standards.iteh.ai/catalog/standards/sist/378ca643-b42d-4d9b-b682-705e9a49a67a/sist-en-757-1999>

EUROPEAN STANDARD

EN 757

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 1997

ICS 25.160.20

Descriptors: arc welding, manual metal arc welding, welding electrodes, covered electrodes, filler metal, weld metal, high yield strength steels, classifications, symbols

English version

## Welding consumables - Covered electrodes for manual metal arc welding of high strength steels - Classification

Produits consommables pour le soudage - Schweißzusätze - Umhüllte Stabelektroden zum Lichtbogenhandschweißen von hochfesten Stählen - Einteilung  
Electrodes enrobées pour le soudage manuel à l'arc des aciers à haute résistance  
Classification

**STANDARD PREVIEW**  
(standards.iteh.ai)

SIST EN 757:1999

<https://standards.iteh.ai/catalog/standards/sist/378ca643-b42d-4d9b-b682-705e9a49a67a/sist-en-757-1999>

This European Standard was approved by CEN on 1997-01-19. 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.

The European Standards exist 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

# CEN

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

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

**Contents**

	<b>Page</b>
<b>Foreword</b>	<b>3</b>
<b>Introduction</b>	<b>4</b>
<b>1 Scope</b>	<b>4</b>
<b>2 Normative references</b>	<b>5</b>
<b>3 Classification</b>	<b>5</b>
<b>4 Symbols and requirements</b>	<b>6</b>
4.1 Symbol for the product/process	6
4.2 Symbol for tensile properties	6
4.3 Symbol for impact properties of all-weld metal	7
4.4 Symbol for chemical composition of all-weld metal	8
4.5 Symbol for type of electrode covering	8
4.6 Symbol for stress relief treatment	8
4.7 Symbol for weld metal recovery and type of current	9
4.8 Symbol for welding position	9
4.9 Symbol for hydrogen content of deposited metal	9
<b>5 Mechanical tests</b>	<b>10</b>
5.1 General	10
5.2 Preheating and interpass temperatures	11
5.3 Pass sequence	11
<b>6 Chemical analysis</b>	<b>11</b>
<b>7 Technical delivery conditions</b>	<b>11</b>
<b>8 Designation</b>	<b>12</b>
<b>Annex A (informative) Bibliography</b>	<b>14</b>

## 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 August 1997, and conflicting national standards shall be withdrawn at the latest by August 1997.

Annex A is informative and contains "Bibliography".

In normative references reference is made to ISO 3690. It should be noted that a European Standard is under preparation for the same subject in CEN/TC 121/SC 3.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 757:1999

<https://standards.iteh.ai/catalog/standards/sist/378ca643-b42d-4d9b-b682-705e9a49a67a/sist-en-757-1999>

## Introduction

This standard proposes a classification in order to designate covered electrodes in terms of the yield strength, tensile strength and elongation of the all-weld metal. The ratio of yield to tensile strength of weld metal is generally higher than that of parent material. Users should note that matching weld metal yield strength to parent material yield strength will not necessarily ensure that the weld metal tensile strength matches that of the parent material. Where the application requires matching tensile strength, therefore, selection of the consumable should be made by reference to column 3 of table 1.

It should be noted that the mechanical properties of all-weld metal test specimens used to classify the electrodes could vary from those obtained in production joints because of differences in welding procedure such as electrode diameter, width of weave, welding position and parent material composition.

## 1 Scope

This standard specifies requirements for classification of covered electrodes based on the all-weld metal in the as-welded or stress relieved conditions for manual metal arc welding of steels with a minimum yield strength higher than 500 N/mm<sup>2</sup>.

## 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.

- |              |   |
|--------------|---|
| EN 499       | Welding consumables - Covered electrodes for manual metal arc welding of non alloy and fine grain steels - Classification                     |
| prEN 759     | Welding consumables - Technical delivery conditions for welding filler metals including type of product, dimensions, tolerances and marking   |
| prEN 1597-1  | Welding consumables - Testing for classification - Part 1: Test assembly for all-weld metal test specimens in steel, nickel and nickel alloys |
| prEN 1597-3  | Welding consumables - Testing for classification - Part 3: Testing of positional capability of welding consumables in a fillet weld           |
| EN ISO 13916 | Welding - Guidance on the measurement of preheating temperature, interpass temperature and preheat maintenance temperature (ISO 13916:1996)   |

- EN 22401 Covered electrodes - Determination of the efficiency, metal recovery and deposition coefficient (ISO 2401:1972)
- ISO 31-0:1992 Quantities and units - Part 0: General principles
- ISO 3690 Welding - Determination of hydrogen in deposited weld metal arising from the use of covered electrodes for welding mild and low steels

### 3 Classification

The classification includes all-weld metal properties obtained with a covered electrode as given below. The classification is based on the electrode diameter 4 mm with the exception of the symbol for welding position which is based on prEN 1597-3.

The classification is divided into nine parts:

- 1) the first part gives a symbol indicating the product/process to be identified;
- 2) the second part gives a symbol indicating the strength and elongation of all-weld metal;
- 3) the third part gives a symbol indicating the impact properties of all-weld metal;
- 4) the fourth part gives a symbol indicating the chemical composition of all-weld metal;
- 5) the fifth part gives a symbol indicating the type of electrode covering;
- 6) the sixth part gives a symbol indicating the stress relief treatment in case this is applied;
- 7) the seventh part gives a symbol indicating the weld metal recovery and type of current;
- 8) the eighth part gives a symbol indicating the welding position;
- 9) the ninth part gives a symbol indicating the hydrogen content of deposited metal.

In order to promote the use of this standard, the classification is split into two sections:

a) Compulsory section

This section includes the symbols for the type of product, the strength and elongation, the impact properties, the chemical composition and the type of covering, i.e. the symbols defined in 4.1, 4.2, 4.3, 4.4 and 4.5.

b) Optional section

This section includes the symbols for the stress relief treatment, the weld metal recovery, the type of current, the welding positions for which the electrode is suitable, and the symbol for hydrogen content, i.e. the symbols defined in 4.6, 4.7, 4.8 and 4.9.

The full designation (see 8) shall be used on packages and in the manufacturer's literature and data sheets.

#### 4 Symbols and requirements

##### 4.1 Symbol for the product/process

The symbol for the covered electrode used in the manual metal arc welding process is the letter E.

##### 4.2 Symbol for tensile properties

The symbol in table 1 indicates yield strength, tensile strength and elongation of the all-weld metal in the as-welded condition or - if a T is added in the designation - after stress relief treatment described in 4.6, determined in accordance with clause 5.

NOTE: Stress relief treatment can alter the strength of the weld metal from that obtained in the as-welded condition.



**Table 1: Symbol for tensile properties**

Symbol	Minimum <sup>1)</sup> yield strength N/mm <sup>2</sup>	Tensile strength N/mm <sup>2</sup>	Minimum elongation <sup>2)</sup> %
55	550	610 to 780	18
62	620	690 to 890	18
69	690	760 to 960	17
79	790	880 to 1080	16
89	890	980 to 1180	15

1) For yield strength the lower yield ( $R_{eL}$ ) is used when yielding occurs, otherwise the 0,2 % proof strength ( $R_{p0,2}$ ) is used.  
2) Gauge length is equal to five times the test specimen diameter.

#### 4.3 Symbol for impact properties of all-weld metal

The symbol in table 2 indicates the temperature at which an average impact energy of 47 J is achieved under conditions given in clause 5. Three test specimens shall be tested. Only one individual value may be lower than 47 J but not lower than 32 J. When an all-weld metal has been classified for a certain temperature, it automatically covers any higher temperature in table 2.

SIST EN 757:1999

**Table 2: Symbol for impact properties of all-weld metal**

Symbol	Temperature for minimum average impact energy 47 J °C
Z	No requirements
A	+ 20
0	0
2	- 20
3	- 30
4	- 40
5	- 50
6	- 60
7	- 70
8	- 80

NOTE: Stress relief treatment can alter the impact properties of the weld metal from that obtained in the as-welded condition.