



**SLOVENSKI STANDARD**  
**SIST EN 61232:1996**

**01-januar-1996**

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**Z aluminijem oplaščene jeklene žice za elektrotehnične namene**

Aluminium-clad steel wires for electrical purposes

Aluminium-ummantelte Stahldrähte für die Elektrotechnik

Fils d'acier revêtus d'aluminium pour usages électriques

**Ta slovenski standard je istoveten z: EN 61232:1995**

[SIST EN 61232:1996](https://standards.iteh.ai/catalog/standards/sist/b23ed608-0e92-4c85-b36b-be65694e6fb3/sist-en-61232-1996)

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**ICS:**

29.060.10      Žice

Wires

**SIST EN 61232:1996**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 61232**

March 1995

ICS 29.060.10

Descriptors: Electric conductor, bare conductor, metallic wire, steel, aluminium covering, electrical property, mechanical property, test

English version

**Aluminium-clad steel wires for electrical purposes  
(IEC 1232:1993, modified)**

Fils d'acier revêtus d'aluminium pour  
usages électriques  
(CEI 1232:1993, modifiée)

Aluminium-ummantelte Stahldrähte für  
die Elektrotechnik  
(IEC 1232:1993, modifiziert)

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This European Standard was approved by CENELEC on 1994-12-06. CENELEC 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 CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**CENELEC**

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

### Foreword

The text of the International Standard IEC 1232:1993, prepared by IEC TC 7, Bare aluminium conductors, together with common modifications prepared by the Technical Committee CENELEC TC 7, was submitted to the formal vote and was approved by CENELEC as EN 61232 on 1994-12-06.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1995-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1995-12-01

For products which have complied with the relevant national standard before 1995-12-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2000-12-01.

Annexes designated "normative" are part of the body of the standard.  
Annexes designated "informative" are given for information only.  
In this standard, annex ZA is normative and annexes A and B are informative.  
Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 1232:1993 was approved by CENELEC as a European Standard with agreed common modifications as given below.

### COMMON MODIFICATIONS

Table 5 - Tensile and resistivity requirements of wires [before stranding]

Replace the existing table 5 by the following:

Table 5 - Tensile and resistivity requirements of wires (before stranding)

1	2	3		4	5	6	7
Class	Type	Nominal diameter		Tensile stress	Stress at 1% extension	Resistivity at 20%	Endurance tensile stress*
		Over	Up to and including	Min.	Min.	Max.	Min.
20SA	A	mm	mm	MPa	MPa	nΩ.m	MPa
		1,24	3,25	1 340	1 200	84,80 [corresponding to 20,3% IACS conductivity]	1 230
		3,25	3,45	1 310	1 180		1 200
		3,45	3,65	1 270	1 140		1 170
		3,65	3,95	1 250	1 100		1 150
		3,95	4,10	1 210	1 100		1 110
		4,10	4,40	1 180	1 070		1 080
		4,40	4,60	1 140	1 030		1 050
		4,60	4,75	1 100	1 000		1 010
		4,75	5,50	1 070	1 000		980
	1,24	5,50	1 320	1 100	---		
27SA	-	2,50	5,00	1 080	800	63,86 [corresponding to 27% IACS conductivity]	990
30SA	-	2,50	5,00	880	650	57,47 [corresponding to 30% IACS conductivity]	810
40SA	-	2,50	5,00	680	500	43,10 [corresponding to 40% IACS conductivity]	620

\* The endurance tensile stress is taken as 92 % of the tensile stress value of the wire before stranding, as specified in column 4. This requirement is used in some countries to calculate the endurance tensile stress of a stranded conductor which is the maximum, constantly held tensile stress which can be withstood for one year without fracture.

## ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD  
WITH THE REFERENCES OF THE RELEVANT EUROPEAN PUBLICATIONS

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.

NOTE : When the international publication has been modified by CENELEC common modifications, indicated by (mod), the relevant EN/HD applies.

IEC Publication	Date	Title	EN/HD	Date
468	1974	Method of measurement of resistivity of metallic materials	-	-

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**NORME  
INTERNATIONALE  
INTERNATIONAL  
STANDARD**

**CEI  
IEC  
1232**

Première édition  
First edition  
1993-06

**Fils d'acier revêtus d'aluminium  
pour usages électriques**

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Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**ALUMINIUM-CLAD STEEL WIRES  
FOR ELECTRICAL PURPOSES**
**FOREWORD**

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters, prepared by technical committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 3) They have the form of recommendations for international use published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

This International Standard IEC 1232 has been prepared by IEC technical committee 7: Bare aluminium conductors.

The text of this standard is based on the following documents:

DIS	Report on Voting
7(CO)434	7(CO)436

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

Annexes A and B are for information only.

## INTRODUCTION

Aluminium-clad steel wires have been used as all aluminium-clad steel stranded wires for overhead ground wire purposes and as reinforcement of aluminium conductors for overhead line conductor purposes. In some cases, they are also used as phase conductors. Since various national standards exist in each country for the aluminium-clad steel wires, this International Standard establishes the requirements for properties.

It should be noted that this standard has been prepared after consideration of the existing IEC 888.

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## ALUMINIUM-CLAD STEEL WIRES FOR ELECTRICAL PURPOSES

### 1 Scope

This International Standard applies to bare, hard-drawn, round, aluminium-clad steel wires of different electrical and mechanical properties, in the diameter ranges shown in table 5, for electrical purposes, before stranding.

It is intended to cover applications, for reinforcement in aluminium conductors and for all aluminium-clad steel stranded conductors.

It does not cover the wires for redrawing purposes.

### 2 Normative references

The following normative document contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

SIST EN 61232:1996

IEC 468: 1974, *Method of measurement of resistivity of metallic materials.*

### 3 Definitions

For the purpose of this International Standard, the following definitions apply:

**3.1 aluminium-clad steel wire:** Round wire consisting of a round steel core with a uniform and continuous aluminium covering.

**3.2 diameter:** Mean of two measurements at right angles taken at the same cross-section.

**3.3 class:** Aluminium-clad steel wires defined as "20SA", "27SA", "30SA" and "40SA", corresponding to their conductivity grades of 20,3 %, 27 %, 30 % and 40 % IACS\*.

**3.4 type:** Aluminium-clad steel wires of class 20SA are divided into two types, A and B, according to their tensile strength characteristics.

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\* IACS: International Annealed Copper Standard.