SLOVENSKI STANDARD
SIST EN 50528:2010

01-december-2010

Izolirne lestve za uporabo na nizkonapetostnih električnih inštalacijah ali v njihovi bližini

Insulating ladders for use on or near low voltage electrical installations

Isolierende Leiter für arbeiten an oder in der Nähe elektrischer Anlagen

Echelles isolantes pour utilisation sur ou à proximité des installations électriques

Ta slovenski standard je istoveten z: EN 50528:2010

ICS:

13.260	Varstvo pred električnim udarom. Delo pod napetostjo	Protection against electric shock. Live working
97.145	Lestve	Ladders

SIST EN 50528:2010 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50528

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ICS 97.145;13.260

English version

Insulating ladders for use on or near low voltage electrical installations

Echelles isolantes pour utilisation sur ou à proximité des installations électriques basse tension

Isolierende Leitern für Arbeiten an oder in der Nähe von Niederspannungsanlagen

This European Standard was approved by CENELEC on 2010-05-01. 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, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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

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Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 78, Equipment and tools for live working. It was submitted to the formal vote and was approved by CENELEC as EN 50528 on 2010-05-01.

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

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)	2011-05-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2013-05-01

Contents

Figures

Tables

Introduction

Ladders covered by this European Standard are used to work on low voltage live parts, such as to perform connector fittings, repair on pole, switching actions. They are also used to carry out operations prior to dead working, as in the case of voltage detection, earthing and short-circuiting, etc.

In all these cases the ladders has two main functions, to reach the part of the installation that needs to be operated on and to protect the worker from risk of electrical injury, by providing the insulation level and maintaining the safety distance between the worker and the live or potentially live installation.

Taking the local risk assessment into account, additional protection (either personal or collective) can be furthermore considered.

This European Standard contributes to the safety of the users provided they are trained to the operations envisaged.

Additional requirements when using the ladders should be considered to fulfil the European Directives and national regulations.

The ladder is used in accordance with EN 50110 series.

This European Standard has been prepared in accordance with the requirements of EN 61477.

1 Scope

This European Standard is applicable to portable ladders made of non conductive stiles, including accessories (cradle, adjustable foot, adjustable ladder stabilizer, foot leveller device, etc.) used to work on or near electrical systems and installations in the low voltage range (below 1 000 V a.c./1 500 V d.c.).

These ladders are used, to provide temporary access, generally on overhead line structures and to undertake electrical operations. They shall be used by one person only

These ladders are not intended to be put in direct contact with energized parts nevertheless they provide sufficient insulation level to protect against inadvertent contact with low voltage live parts.

The requirements and tests described in this European Standard shall be considered in addition to the EN 131 series.

NOTE This European Standard does not cover ladders for applications upper than 1 000 V a.c/1 500 V d.c. These products are separately covered by a specific standard (EN 61478).

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 131-1:2007, *Ladders – Part 1: Terms, types, functional sizes*

EN 131-2:1993, *Ladders – Part 2: Requirements, testing, marking*

EN 131-3:2007, *Ladders – Part 3: User instructions*

EN 131-4:2007, *Ladders – Part 4: Single or multiple hinge-joint ladders*

EN 60068-1:1994, *Environmental testing – Part 1: General and guidance* (IEC 60068-1:1988 + corrigendum Oct. 1988 + A1:1992)

EN 61318:2008, *Live working – Conformity assessment applicable to tools, devices and equipment* (IEC 61318:2007)

EN 61477:2009, *Live working – Minimum requirements for the utilization of tools, devices and equipment* (IEC 61477:2009 + corrigendum Apr. 2009)

EN 61478:2001 + A1:2003, *Live working – Ladders of insulating material* (IEC 61478:2001 + A1:2003, mod.)

IEC 60417, *Graphical symbols for use on equipment*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

NOTE 1 Further information on terminology is given in EN 131-1.

NOTE 2 The term “ladder” is used in this document for “ladders for use on or near low voltage installations”.

3.1
adjustable foot
adjustable device with anti-skit shoes inserted or secured on the base of the stiles in order to provide a firmly grip to the ground

NOTE Function can be obtained by mean of rotatable, traversable type or other appropriate constructions.

3.2
adjustable ladder stabilizer
system of support legs fitted to the ladder to reinforce stability when working

3.3
cradle
device designed to rest on the pole on which it is positioned

3.4
fixing straps
device designed to secure the ladder to the structure (pole)

3.5
foot leveller device
device inserted or secured at the base of the stiles that provides stability to the ladder and/or balances automatically the ground level differences

3.6
individual standing platform
standing surface allowing to stay (and operate) at the working place

3.7
insulated material
conductive material partly or totally coated with insulating material

3.8
non conductive material
material either insulating or insulated

3.9
rung wear devices
devices that reduce the friction and ease the operation of extending ladders by limiting the rung/stile contact

3.10
stile closures
bottom and upper-ends caps to close the stiles

3.11
sliding guides
sleeves that help to slide sections of extending ladders and avoid rim damage to the ladder stiles

3.12
sliding wheels
roller devices that help to erect extending ladders and to protect walls from dents and scratches

4 Requirements

4.1 Safety requirements

The ladders shall be designed and manufactured to contribute to the safety of the users provided they are used in accordance with the manufacturer's instruction for use.

Constructive arrangements shall be such as to prevent any misuse (i.e. ladders set at reverse side). Construction design shall be such as to minimise the penetration of water and dirt.

The stiles shall be of electrically non conductive material.

The rungs (whatever their length) may be either in conductive or non conductive material.

All items that could reach inadvertently live conductors and having overall dimension exceeding 300 mm shall not impair the electrical properties of the ladder.

Among them are: cradle, individual standing platform.

Any bare conductive parts (see 4.3) of these items shall not exceed 300 mm in length.

This requirement excludes the following items:

- foot leveller device;
- adjustable ladder stabilizer;
- locking device;
- rope(s).

The rungs shall have a non-slip surface. The shape of the rungs shall be designed to ensure a firm grip for gloved hands and also a support that ensures comfort for the worker wearing shoes or boots.

4.2 Functional requirements

4.2.1 General

All metallic elements shall be protected against corrosion.

The complete ladder shall be as light as practicable.

4.2.2 Ropes (if any)

Ropes for extending ladders shall be made of synthetic fibre. The design being polystrands (approximate diameter 10 mm)

Ropes shall have a minimum breaking strength of 1 250 daN. Their length shall be such that it could be always possible to secure their free extremity at the lower rung of the base section whatever the allowed extension of the ladder.

4.2.3 Stile closures

The stile closures shall be made of soft material and shall be antiskid. The stile closures at the base shall be such designed to provide a satisfactory adherence to the ground.

They shall be easily dismountable for replacement.

4.2.4 Pulleys (if any)

Their sheaves shall have a groove wider than 10 mm.

4.2.5 Rung wear devices

The rung wear devices shall be such designed they avoid any premature wearing effect of the rungs and stiles.

4.2.6 Cradle

The ladder shall be equipped with a cradle (an example is shown in Figure 1) avoiding that the upper rung rests on the structure. Wearable parts shall be easily dismountable for replacement and made of soft slip resistant material.

Cradle shall withstand stresses without breaking.

4.2.7 Foot leveller device

They shall be adjustable in height on both sides of the ladder.

They shall be such designed to be safely attached at the base of the ladder without causing damages to the stiles.

Their shoes shall offer either soft antiskid or ice pick plates.

They shall be manually or automatically locked in place and withstand the weight of the whole equipment.

Example of design is given in Figure 3 a) while Figure 3 b) shows an example of leveller device equipped with adjustable feet.

4.2.8 Adjustable ladder stabilizer (if any)

They shall provide extra stability by extending the base of the ladder.

4.2.9 Individual standing platform (if any)

The total overall length of the standing platform shall be in the range of 0,4 m and 1,5 m; its width shall be within 0,4 m and 1 m.

The platform shall be fixed at residence to the ladder (an example is shown in Figure 4). The access side shall be equipped with mobile and interdependent rigid top guard rails and intermediate rails. The platform shall be equipped with toe board on the three other sides.

The difference in width between the external edge of the toe boards and the internal edge of the top guard rails should be less than or equal to 50 mm on each side.

The height of the plinth shall be a minimum of 0,1 m. The height of the stringer shall be between 1 m and 1,1 m and the height of the under stringer shall be between 0,45 m and 0,55 m.

The platform shall withstand a static load of 150 DaN.

The guard rails and the floor shall withstand stresses without permanent deformation dislocation or breaking.

4.3 Electrical requirements

Any electrically non conductive part of the ladder (and supplementary equipments if existing) shall withstand an electrical stress.

4.4 Mechanical requirements

4.4.1 General

Ladder shall successfully pass the mechanical tests as specified in EN 131-2.

4.4.2 Design

This European Standard applies to the type of ladders as described in EN 131-1 and EN 131-4.

4.4.3 Dimensions, construction

The dimensions and tolerances shall fulfil the EN 131-1 requirements.

A cradle can replace the upper rung of the upper part of the ladder.

4.5 Markings

Additionally to the marking required by EN 131-3 each ladder shall carry the following information in a durable form:

- mention of 1 000 V a.c./1 500 V d.c. adjacent to the double triangle symbol (symbol IEC 60417-5216 suitable for live working) (see Note);
- reference to this European Standard;
- manufacturer's name or trademark;
- serial or batch number or month and year of fabrication.

NOTE This symbol identifies any product covered by an IEC/TC 78 international standard. A product marked with this symbol is to be considered in that sense, as a live working tool. However, it does not mean that this product is suitable only to carry out live working operations, in accordance with the working procedures specified by EN 50110 series or by national regulations.

These marking shall be legible and indelible or be firmly adhered the characters shall be 3 mm high. The marking shall not impair the electrical properties of the insulating elements.

All relevant pictograms shall conform to EN 131-3.

Additional pictograms that pertain the field of use of this European standard can be added.

4.6 Instruction for use

Each ladder shall be accompanied by the manufacturer's instruction for use. These extra recommendations shall be considered as a complement of the EN 131-3 that advices on the safe use of ladders. The use of pictograms for basic instructions conforming EN 131-3 is recommended.

The following are the minimum user instructions that shall accompany the ladder:

- statement that the ladder shall be use by skilled and instructed persons and in accordance with safe methods of work;
- electrical field of use and limits of the installation where the ladder can be used;