BS EN 50528:2010

BSI Standards Publication

Insulating ladders for use on or near low voltage electrical installations

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

raising standards worldwide™

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS

Not for Resale

National foreword

This British Standard is the UK implementation of EN 50528:2010.

The UK participation in its preparation was entrusted to Technical Committee PEL/78, Tools for live working.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© BSI 2010

ISBN 978 0 580 65380 3

ICS 13.260; 97.145

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 December 2010.

Amendments issued since publication

Date	Text affected

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS

Not for Resale

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50528

May 2010

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

© 2010 CENELEC - All rights of exploitation in any form and by any means reserved worldwide for CENELEC members.

Ref. No. EN 50528:2010 E

--`,,```,,,,````-`-`,,`,,`,`,,`---

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS

Not for Resale

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

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS Not for Resale

Contents

Figures

Tables

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS
Not for Resale

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.

--`,,```,,,,````-`-`,,`,,`,`,,`---

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS Not for Resale

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”.

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS
Not for Resale

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

--`,,```,,,,````-`-`,,`,,`,`,,`---

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS Not for Resale

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.

--`,,```,,,,````-`-`,,`,,`,`,,`---
Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS
Not for Resale

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.

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS Not for Resale

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;

--`,,```,,,,````-`-`,,`,,`,`,,`---

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS
Not for Resale

- clear warning that the ladder is not intended to be put in direct contact with energized parts;
- note about the possible use of protective equipments (personal and/or collective);
- explanations of the items of marking;
- selection of the ladder and accessories according the work to be undertaken;
- verification of condition of the ladder before using and visual inspection;
- instruction for storage, transportation and care (example the instruction that the ladder have to be kept dry and clean);
- instruction for cleaning and maintenance.

5 Verification and testing

5.1 General

Unless otherwise specified, tests shall be carried out on normal ambient atmospheric conditions in accordance with EN 60068-1:

- temperature range: 15 °C to 35 °C;
- relative humidity: 45 % to 80 %;
- atmospheric pressure: 86 kPa to 106 kPa.

Except otherwise specified the ladders shall be configured in a mode that represents the normal working conditions according the manufacturer's instruction for use.

The present standard provides testing provisions to demonstrate compliance of the product to the requirements of Clause 4. These testing provisions are primarily intended to be used as type test for validation of the design input. Where relevant, alternative means (calculation, examination, tests, etc.), are specified within the test sub clauses for the purpose of ladders having completed the production phase.

The type tests shall be performed on three complete ladders of the same design. Tests shall be performed in the sequence defined in Annex C.

Prior to complete the type testing a visual inspection including

- the good condition of the ladder and its accessories (if any),
- the correct assembly of the whole,
- the presence of the markings,
- the availability of the instruction for use

shall be performed.

--`,,```,,,,````-`-`,,`,,`,`,,`---

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS Not for Resale

5.2 Design, dimensions, construction

The design of the ladder (and accessories) shall be verified by inspection according to 4.1, 4.2, 4.4.2, 4.4.3.

The construction and dimensions of the ladder (and accessories) shall be verified by inspection according to 4.1, 4.2, 4.4.2, 4.4.3.

5.3 Mechanical tests

5.3.1 Type test

Mechanical test according EN 131-2 applies.

Individual standing platform shall withstand a static load of 150 daN. No disassembly or breakage is allowed.

The railing parts of the platform shall withstand a mechanical stress

- of 30 daN applied horizontally toward the outside without permanent deformation, a maximum deflection of 35 mm is allowed,
- of 125 daN applied vertically without permanent deformation, a maximum deflection of 200 mm is allowed.

The floor of the platform shall withstand a vertical force of 150 daN without permanent deformation. The load is applied by means of a steel plate of 200 mm x 200 mm having a thickness of 15 mm placed at the most unfavourable location of the floor. The maximum residual deformation after load removal shall be less than 5 mm.

Foot leveller devices or adjustable ladder stabilizer (if existing) shall comply with testing procedure of EN 131-2:1993, 4.8, with the following deviation:

- the force of 260 daN shall be applied at the uppermost rung.

Cradle shall withstand a force of 100 daN in the direction corresponding of the working conditions.

Adjustable ladder stabilizer (if existing) shall withstand a force of 45 daN applied horizontally in the most unfavourable direction at the highest level position the feet could reach according the manufacturer's instruction for use. If a platform is fitted the force shall be applied at the highest floor level. The widening of the ladder stabilizer shall be adjusted at the narrowest position prescribed by the manufacturer.

A load of 75 daN shall be placed at the same level as the above horizontal force has to be applied.

The test is considered as passed if any part of the ladder does not get lifted from the ground.

5.3.2 Alternative means for ladders having completed the production phase

It is not practical to perform mechanical tests after completing the production phase for checking the conformity to the relevant requirements. Nevertheless, the manufacturer shall prove that he has followed the same documented assembly procedure as per the type tested device.

The manufacturer shall document components that could affect the mechanical characteristics of the ladder.

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS
Not for Resale

5.4 Marking

5.4.1 Presence of marking

It shall be checked by visual inspection that the requirements of 4.5 are fulfilled.

5.4.2 Durability of marking

In order to be sure the markings comply with the requirements defined in 4.5; they shall be rubbed with a rag soaked in water for 1 min and then rubbed with another rag soaked in isopropanol for another 1 min.

The test is considered as passed if the markings remain legible and the letters do not smear even if the surface of the ladder shows alteration.

5.5 Instruction for use

It shall be checked by visual inspection that the requirements of 4.6 are fulfilled.

At the production level, it is only needed to check for the availability of the instructions for use.

5.6 Electrical tests

5.6.1 Type test

5.6.1.1 Stiles

This test shall be carried out on each stiles of the ladder having completed the ageing tests of 1 000 cycles according to EN 61478:2001, 6.4.1.3. If the ladder is composed of several parts, the test shall be repeated on each part.

Test pieces taken from ladders are immerged for 24 h in water, having a resistivity of (100 ± 15) Ω.m and then removed from the water bath and wiped carefully prior to apply the test voltage.

Conductive electrodes according to Figure 2 are attached to two adjacent rungs free from any conductive items. The two electrodes are positioned in such way they touch the same stile.

The voltage applied between the electrodes is an alternating voltage with a frequency between 40 Hz and 62 Hz, increasing gradually from 0 V to the test voltage *U* at a rate of 1 kV/s.

The test voltage applied is 10 kV.

The test voltage is then maintained for 1 min. The test is rerun on each couple of adjacent rungs and in contact of each stile.

The leakage current shall be measured continuously during the application of the test voltage.

The voltage source shall have a short-circuit current that is not less than 0,5 A at 30 kV.

The test is considered as passed if no flashover, no puncture occurs and if the maximum leakage current remains less than 0,5 mA.

NOTE The leakage current specified for this test is given in r.m.s. values.

5.6.1.2 Other non conductive parts

Items with a length of more than 300 mm (except those listed in 4.1) shall be submitted to test.

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS Not for Resale

Test pieces are immerged for 24 h in water, having a resistivity of (100 ± 15) Ω.m and then removed from the water bath and wiped carefully prior to apply the test voltage.

Two tape electrodes shall be placed at 300 mm from each other on all section suspected to be non conductive.

The voltage applied between the electrodes is an alternating voltage with a frequency between 40 Hz and 62 Hz, increasing gradually from 0 V to the test voltage *U* at a rate of 1 kV/s.

The test voltage applied is 10 kV.

The test voltage is then maintained for 1 min.

The test is considered as passed in no flashover or signs of tracking appear.

5.6.2 Alternative means for ladders having completed the production phase

The manufacturer shall prove that he has followed the same documented assembly procedure as per the type tested device.

The manufacturer shall document components that could affect the performance of the ladders with regard to the influence of the insulation.

6 Conformity evaluation

For leading the conformity assessment during the production phase EN 61318 shall be used in conjunction with the present standard.

Annex A issued of a risk analysis on the performance of the ladders provides the classification of defects and identifies the associated tests applicable in case of production follow-up.

7 Modifications

Any change of design or material that affects performance of the ladders shall require the type tests to be repeated, in whole or in part, as well as a change in the reference literature.

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS
Not for Resale

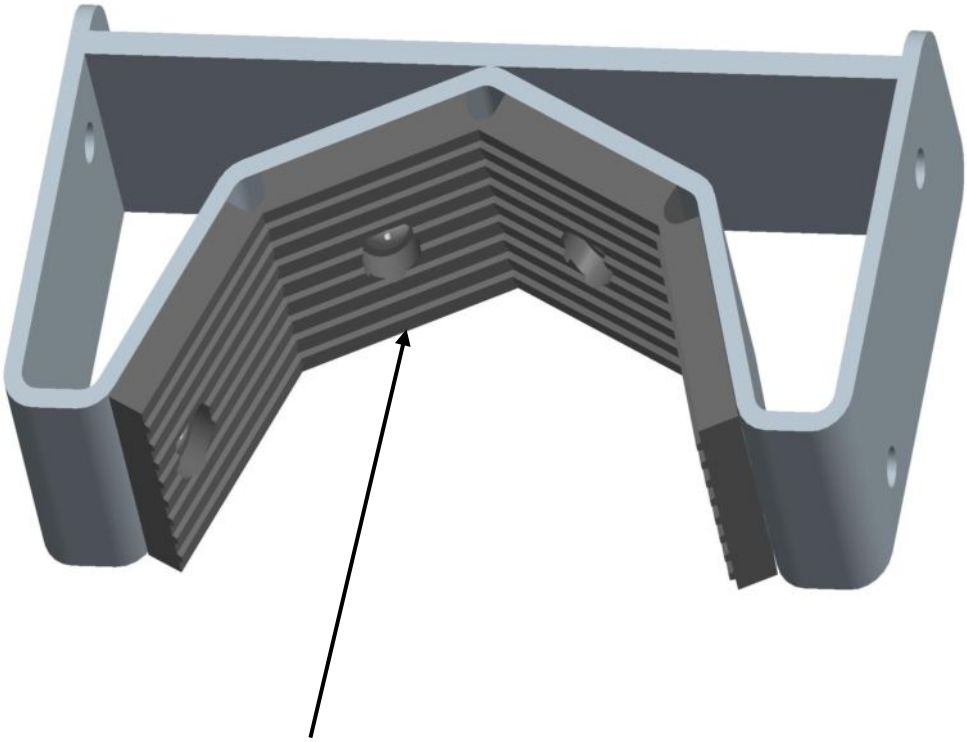
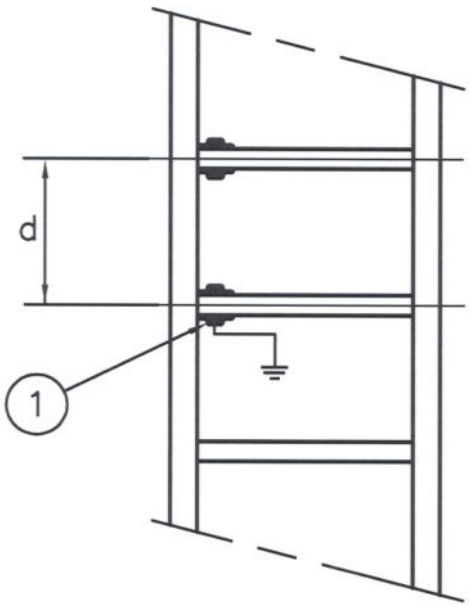


Figure 1 – Cradle sketch plan (given as an example)

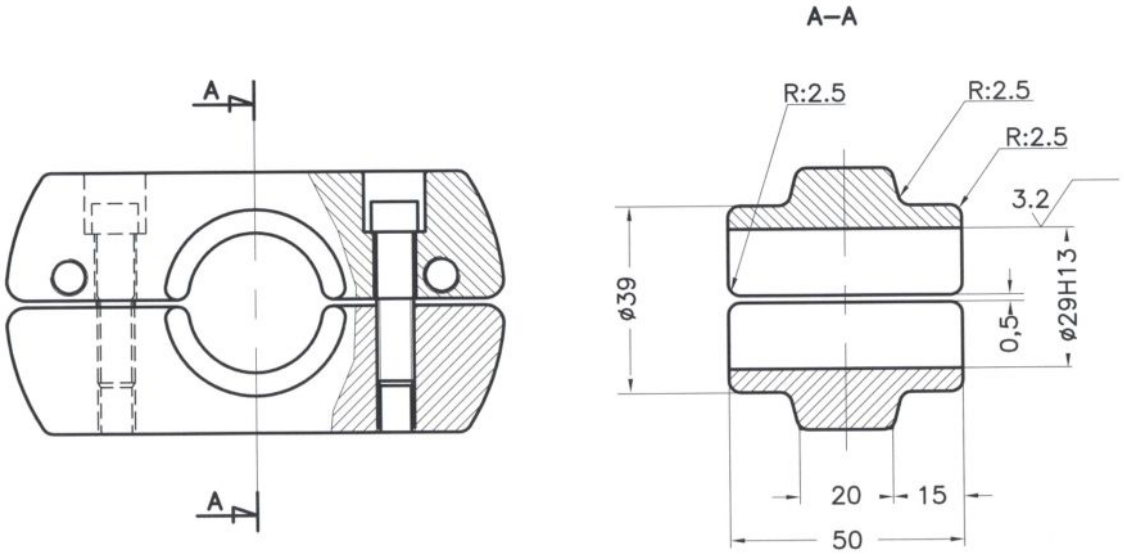
Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS
Not for Resale



Key
1 Electrode

a) Test configuration

Dimension in mm

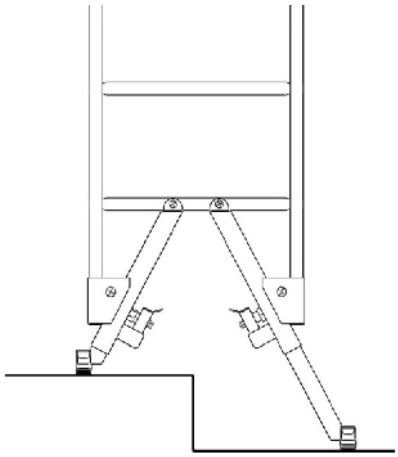


Copper or aluminium alloy

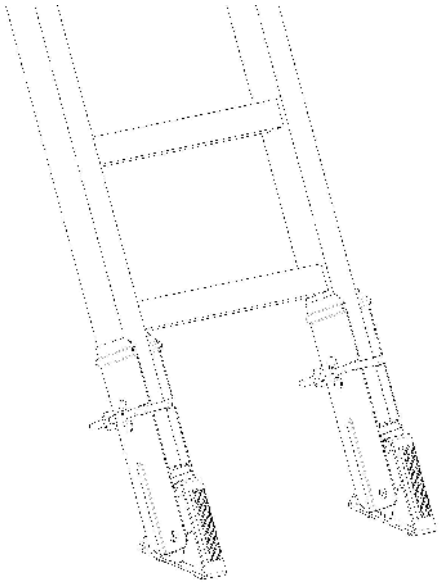
b) Example of electrode used for test

Figure 2 – Test on stiles – Configuration and type of electrodes used

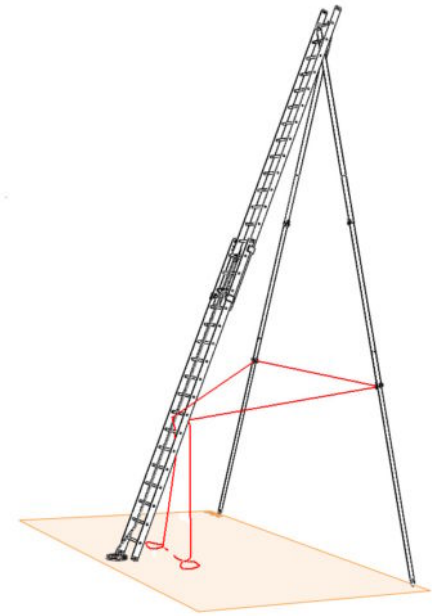
Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS
Not for Resale



a) Example of foot leveler device



b) Example of adjustable feet



c) Two examples of adjustable ladder stabilizer

Figure 3 – Examples of foot leveller device, adjustable feet and adjustable ladder stabilizer

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS
Not for Resale

Figure 4 – Example of individual standing platform

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS
Not for Resale

Annex A
(normative)

Classification of defects and associated requirements and tests

This annex was developed to address the type of defects of manufactured ladders (critical, major or minor) in a consistent manner (see EN 61318). For each requirement identified in Table A.1, both the type of defect and the associated test are specified.

Table A.1 – Classification of defects and associated requirements and tests

Requirements	Type of defects			Tests
	Critical	Major	Minor	
Compliance of the ladder with EN 131-2 and EN 132-1:2007, 4.4	X			5.3.2
Visual verification 4.2, 4.4.2-4.4.3		X		5.2
Electrical requirements 4.3	X			5.6.2
Markings EN 131-3 plus additional marking (Presence) Durability	 X 	X X		5.4.1
Instruction for use (Presence) 4.6	X			5.5

--`,,```,,,,````-`-`,,`,,`,`,,`---
Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS Not for Resale

Annex B
(informative)

In-service recommendations

B.1 General

EN 131-3:2007, 7.5, provides general provisions for repair, maintenance and storage.

B.2 Use and storage

The ladder should only be used and stored as specified in the manufacturer's instructions for use.

Care should be taken to make sure that handling and working conditions are in accordance with the manufacturer's instruction for use.

Use only accessories specified by the manufacturer.

Do not use the ladder at the vicinity of electrical installations that overpass the low voltage range (1 000 V a.c/1 500 V d.c.).

Check, before use, the functioning of the ladder in accordance with the manufacturer's instruction for use.

During handling do not enter in direct contact with energized parts.

B.3 Inspection before use

When a ladder is to be used, a visual inspection should be done.

Do not use a ladder if it appears damaged. Look for cracks or missing parts, pay attention to any dirt that may be present on insulated/insulating parts (stiles, sliding guides).

If there is a serious concern that the ladder is not in good condition, it should be returned to the manufacturer or authorized facility for repair or rejection.

B.4 Maintenance

B.4.1 Regular maintenance

The user should adhere to the following:

- periodically wipe the ladder with a cloth either soaked in water, with detergent additives or with solvents recommended by the manufacturer. Do not use acid or abrasive solvents. After wiping, let the ladder dry;
- shake out any dirt that may be in the connecting points;
- do not try to disassemble the ladder;

--`,,```,,,,````-`-`,,`,,`,`,,`---
Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS
Not for Resale

- check and replace by genuine spare parts damaged wearing items (sliding wheels or guides);
- for servicing the ladder use only specified replacement parts.

B.4.2 Periodic maintenance

Periodic maintenance on ladders is recognized as a basis for insuring their good functioning and the safety of the user. They should be fully inspected at least once a year. If there is a doubt on the electrical integrity –at any time– the ladder should be returned to a test laboratory for inspection followed by a routine electrical test.

It is recommended that the periodic maintenance be done by the manufacturer or at an agreed trained repair facility.

It is the responsibility of the owner to outline the maintenance schedule, taking into account the use conditions (storage, regular care, training of the user, etc).

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS Not for Resale

Annex C
(normative)

General test procedure

Table C.1 – Sequential order for performing tests

Sequential order	Type test	Subclause	Requirements
1	Design, dimensions, construction (including the accessories)	5.2	4.1, 4.2 4.4.2, 4.4.3
2	Compliance of the ladder with EN 131-2	5.3.1	4.4
3	Marking; presence, conformity	5.4.1	4.5
4	Marking; durability	5.4.2	4.5
5	Instruction for use (conformity and presence)	5.5	4.6
6	Electrical tests	5.6.1	4.3

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS
Not for Resale

Bibliography

EN 59, *Glass reinforced plastic – Measurement of hardness by means of a Barcol impressor*

EN 131-X, *Ladders – Part X: Ageing tests*

EN 50110-1:2004, *Operation of electrical installations*

EN 50110-2:1996, *Operation of electrical installations – Part 2: National annexes*

EN 60743:2001, *Live working – Terminology for tools, equipment and devices* (IEC 60743:2001)

Directive 2001/45/EC of the European Parliament and of the Council of 27 June 2001 amending Council Directive 89/655/EEC concerning the minimum safety and health requirements for the use of work equipment by workers at work (second individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC), OJ L 195, 19.7.2001, p. 46–49

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS
Not for Resale

This page deliberately left blank

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS

Not for Resale

British Standards Institution (BSI)

BSI is the independent national body responsible for preparing British Standards and other standards-related publications, information and services.
It presents the UK view on standards in Europe and at the international level.

It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001

BSI offers Members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Tel: +44 (0)20 8996 7669 Fax: +44 (0)20 8996 7001
Email: plus@bsigroup.com

Buying standards

You may buy PDF and hard copy versions of standards directly using a credit card from the BSI Shop on the website **www.bsigroup.com/shop.** In addition all orders for BSI, international and foreign standards publications can be addressed to BSI Customer Services.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001
Email: orders@bsigroup.com

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Knowledge Centre.

Tel: +44 (0)20 8996 7004 Fax: +44 (0)20 8996 7005
Email: knowledgecentre@bsigroup.com

Various BSI electronic information services are also available which give details on all its products and services.

Tel: +44 (0)20 8996 7111 Fax: +44 (0)20 8996 7048
Email: info@bsigroup.com

BSI Subscribing Members are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration.

Tel: +44 (0)20 8996 7002 Fax: +44 (0)20 8996 7001
Email: membership@bsigroup.com

Information regarding online access to British Standards via British Standards Online can be found at **www.bsigroup.com/BSOL**

Further information about BSI is available on the BSI website at **www.bsigroup.com/standards**

Copyright

Copyright subsists in all BSI publications. BSI also holds the copyright, in the UK, of the publications of the international standardization bodies. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI. This does not preclude the free use, in the course of implementing the standard of necessary details such as symbols, and size, type or grade designations. If these details are to be used for any other purpose than implementation then the prior written permission of BSI must be obtained. Details and advice can be obtained from the Copyright & Licensing Manager.

Tel: +44 (0)20 8996 7070
Email: copyright@bsigroup.com

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Tel +44 (0)20 8996 9001
Fax +44 (0)20 8996 7001
www.bsigroup.com/standards

raising standards worldwide™

Copyright British Standards Institution
Provided by IHS under license with BSI - Uncontrolled Copy
No reproduction or networking permitted without license from IHS

Not for Resale