



NSAI
Standards

Irish Standard
I.S. EN 60832-1:2010

Live working - Insulating sticks and attachable devices -- Part 1: Insulating sticks (IEC 60832-1:2010 (EQV))

I.S. EN 60832-1:2010

Incorporating amendments/corrigenda issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

<p><i>This document replaces:</i> EN 60832:1996 (partially)</p>	<p><i>This document is based on:</i> EN 60832-1:2010</p>	<p><i>Published:</i> 19 March, 2010</p>
<p>This document was published under the authority of the NSAI and comes into effect on: 9 April, 2010</p>		<p>ICS number: 13.260; 33.210.20</p>
<p>NSAI 1 Swift Square, Northwood, Santry Dublin 9</p>	<p>T +353 1 807 3800 F +353 1 807 3838 E standards@nsai.ie W NSAI.ie</p>	<p>Sales: T +353 1 857 6730 F +353 1 857 6729 W standards.ie</p>
<p>Údarás um Chaighdeáin Náisiúnta na hÉireann</p>		

English version

**Live working -
Insulating sticks and attachable devices -
Part 1: Insulating sticks
(IEC 60832-1:2010)**

Travaux sous tension -
Perches isolantes et outils adaptables -
Partie 1: Perches isolantes
(CEI 60832-1:2010)

Arbeiten unter Spannung -
Isolierende Stangen und auswechselbare
Adapter/Arbeitsköpfe -
Teil 1: Isolierende Stangen
(IEC 60832-1:2010)

This European Standard was approved by CENELEC on 2010-03-01. 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

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 78/838/FDIS, future edition 1 of IEC 60832-1, prepared by IEC TC 78, Live working, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60832-1 on 2010-03-01.

This EN 60832-1, together with EN 60832-2, supersedes EN 60832:1996. The two parts have been created to clearly separate the requirements and testing of insulating sticks from those of attachable devices.

Compared to EN 60832:1996, the major changes included in EN 60832-1:2010 are:

- integration of a cold impact test on the end fitting;
- creation of an electrical category of end fittings;
- integration of a test of the dielectric strength of internal insulation;
- modification of the dye penetration test (disappearance of fuchsine);
- application of conformity assessment for products having completed the production phase, according to IEC 61318:2007 (Edition 3), focusing on the classification of defects and the introduction of alternative testing in case of production follow-up.

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) 2010-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2013-03-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60832-1:2010 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

- | | | |
|----------------|------|---|
| IEC 60743:2001 | NOTE | Harmonized as EN 60743:2001 (not modified). |
| IEC 61472:2004 | NOTE | Harmonized as EN 61472:2004 (not modified). |
-

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60060-1	-	High-voltage test techniques - Part 1: General definitions and test requirements	HD 588.1 S1	-
IEC 60212	1971	Standard conditions for use prior to and during the testing of solid electrical insulating materials	HD 437 S1	1984
IEC 60417	-	Graphical symbols for use on equipment	-	-
IEC 60855-1	-	Live working - Insulating foam-filled tubes and solid rods - Part 1: Tubes and rods of a circular cross- section	FprEN 60855-1	-
IEC 61318	2007	Live working - Conformity assessment applicable to tools, devices and equipment	EN 61318	2008
IEC 61477	-	Live working - Minimum requirements for the utilization of tools, devices and equipment	EN 61477	-
ISO 8486-1	1996	Bonded abrasives - Determination and designation of grain size distribution - Part 1: Macrogrits F4 to F220	-	-

This page is intentionally left BLANK.

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms, definitions and symbols	7
3.1 Terms and definitions	7
3.2 Symbols	8
4 Requirements	8
4.1 General.....	8
4.2 Electrical insulation	8
4.3 Electrical category of end fittings.....	9
4.4 Dimensional and mechanical requirements	9
4.4.1 Dimensional requirements	9
4.4.2 Mechanical requirements.....	9
4.5 Insulating sticks end fittings	11
4.5.1 Mechanical protection.....	11
4.5.2 Protection against corrosion	11
4.5.3 Conductive parts	11
4.6 Multiple-tube or multiple-rod tools	11
4.7 Marking.....	11
4.8 Instructions for use.....	12
5 Tests	12
5.1 General.....	12
5.2 Visual inspection	13
5.3 Dimensional check	13
5.4 Durability of marking	13
5.5 Mechanical tests	13
5.5.1 Cold impact test on the end fitting	13
5.5.2 Torsion	16
5.5.3 Tension	17
5.5.4 Compression	17
5.5.5 Bending.....	17
5.5.6 Torsion test of wing screw(s)	19
5.6 Dye penetration test	19
5.7 Electrical tests.....	19
5.7.1 Electrical test after water conditioning	19
5.7.2 Dielectric strength of internal insulation	21
5.8 Specific tests.....	23
5.8.1 Tie stick – Tension test of the rotary blade and hook	23
5.8.2 Hook stick – Operating rod functioning	24
5.8.3 Hook stick extension – Tension strength of the connecting clamp	25
5.8.4 Wire holding stick – Tightening capability	26
5.8.5 Pliers stick.....	27
5.8.6 Insulating oiler stick – Functioning of the operating rod	28
5.8.7 Wire cutter stick – Binding-wire cutter stick – Cutting capability.....	29
5.8.8 Measuring stick	29

5.8.9	Tension puller (dead-end tool)	31
5.9	Instructions for use	32
5.9.1	Type test	32
5.9.2	Alternative test in case of insulating sticks having completed the production phase	32
6	Conformity assessment of insulating sticks having completed the production phase	32
7	Modifications	32
Annex A (normative)	Suitable for live working; double triangle	33
Annex B (normative)	Chronology of type tests	34
Annex C (normative)	Classification of defects and associated tests	40
Annex D (informative)	In-service recommendations	43
Bibliography	46
Figure 1	– Cold impact test on the end fitting	16
Figure 2	– Bending test	18
Figure 3	– Electrical test after water conditioning	20
Figure 4	– Dielectric strength of internal insulation	22
Figure 5	– Tie stick – Tension of the rotary blade	23
Figure 6	– Tie stick – Tension of the rotary hook	24
Figure 7	– Hook stick – Operating rod functioning	25
Figure 8	– Hook stick extension – Tensile strength test for the connecting clamp	26
Figure 9	– Wire holding stick – Tightening capability	26
Figure 10	– Pliers stick – Tightening capability	27
Figure 11	– Pliers stick – Torsion of the support handle	27
Figure 12	– Pliers stick – Torsion of the operating handle	28
Figure 13	– Insulating oiler stick – Functioning of the operating rod	29
Figure 14	– Measuring stick – Resistance to abrasion	30
Figure 15	– Electrical test on type A tension puller	31
Figure 16	– Electrical test on type B tension puller	32
Table 1	– Mechanical characteristics of hand sticks (to be supplied by the manufacturer)	10
Table 2	– Mechanical characteristics of support sticks (to be supplied by the manufacturer)	10
Table 3	– Torque values and pass criteria of the torsion test	17
Table 4	– Tensile forces and pass criteria of the tension test	17
Table 5	– Compression forces and pass criteria of the compression test	17
Table 6	– Bending forces and pass criteria of the bending test	17
Table B.1	– Type tests for hand sticks	34
Table B.2	– Type tests for support sticks	38
Table C.1	– Classification of defects and associated requirements and tests for hand sticks	40
Table C.2	– Classification of defects and associated requirements and tests for support sticks	42

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**LIVE WORKING – INSULATING STICKS
AND ATTACHABLE DEVICES –**

Part 1: Insulating sticks

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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 IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60832-1 has been prepared by IEC technical committee 78: Live working.

The first edition of IEC 60832-1 and that of IEC 60832-2 cancel and replace the first edition of IEC 60832 published in 1988. The two parts have been created to clearly separate the requirements and testing of insulating sticks from those of attachable devices.

Compared to IEC 60832, the major changes included in IEC 60832-1 are:

- integration of a cold impact test on the end fitting;
- creation of an electrical category of end fittings;
- integration of a test of the dielectric strength of internal insulation;
- modification of the dye penetration test (disappearance of fuchsine);

I.S. EN 60832-1:2010

60832-1 © IEC:2010

– 5 –

- application of conformity assessment for products having completed the production phase, according to IEC 61318:2007 (Edition 3), focusing on the classification of defects and the introduction of alternative testing in case of production follow-up.

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

FDIS	Report on voting
78/838/FDIS	78/844/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 60832 series, published under the general title *Live working – Insulating sticks and attachable devices*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

The purpose of this standard is to provide essential requirements. Each user may supplement it with their own requirements. For example, the user may add requirements regarding the use of insulating sticks on d.c. electrical installations or the mechanical performance or compatibility and interchangeability with tools already in service. In such cases, caution should be taken to maintain or improve the performance of the products.

This publication has been prepared in accordance with the requirements of IEC 61477.

The products designed and manufactured according to this standard contribute to the safety of the users provided they are used by skilled persons, in accordance with safe methods of work and the instructions for use.

The product covered by this standard may have an impact on the environment during some or all stages of its life cycle. These impacts can range from slight to significant, be of short-term or long-term, and occur at the global, regional or local level.

Except for a disposal statement in the instructions for use, and special considerations for the selection of a dye (see 5.6), this standard does not include requirements and test provisions for the manufacturers of the product, or recommendations to the users of the product for environmental improvement. However, all parties intervening in its design, manufacture, packaging, distribution, use, maintenance, repair, reuse, recovery and disposal are invited to take account of environmental considerations.

LIVE WORKING – INSULATING STICKS AND ATTACHABLE DEVICES –

Part 1: Insulating sticks

1 Scope

This part of IEC 60832 gives the essential requirements for insulating sticks for live working for use on a.c. electrical installations.

Part 2 of IEC 60832 covers devices that can be attached onto and removed from the fitting of the insulating sticks.

The products designed and manufactured according to this standard contribute to the safety of the users provided they are used by skilled persons, in accordance with safe methods of work and the instructions for use.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this international standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60060-1, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60212:1971, *Standard conditions for use prior to and during the testing of solid electrical insulating materials*

IEC 60417, *Graphical symbols for use on equipment*

IEC 60855-1, *Live working – Insulating foam-filled tubes and solid rods – Part 1: Tubes and rods of a circular cross-section*

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

IEC 61477, *Live working – Minimum requirements for the utilization of tools, devices and equipment*

ISO 8486-1:1996, *Bonded abrasives – Determination and designation of grain size distribution – Part 1: Macrogrits F4 to F220*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61318 and the following apply.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
 - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-