

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Insulators for overhead lines with a nominal voltage above 1 000 V – Ceramic or glass insulator units for AC systems – Characteristics of insulator units of the cap and pin type

Isolateurs pour lignes aériennes de tension nominale supérieure à 1 000 V – Éléments d'isolateurs en céramique ou en verre pour réseaux à tension alternative – Caractéristiques des éléments d'isolateurs du type capot et tige



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2021 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC online collection - oc.iec.ch

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 18 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC -

webstore.iec.ch/advsearchform

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC online collection - oc.iec.ch

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Insulators for overhead lines with a nominal voltage above 1 000 V – Ceramic or glass insulator units for AC systems – Characteristics of insulator units of the cap and pin type

Isolateurs pour lignes aériennes de tension nominale supérieure à 1 000 V – Éléments d'isolateurs en céramique ou en verre pour réseaux à tension alternative – Caractéristiques des éléments d'isolateurs du type capot et tige

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.080.10; 29.240.20

ISBN 978-2-8322-9203-7

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD	3
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Mechanical characteristics, dimensions and types	6
5 Designation and marking with respect to shed profile	6
6 Tolerances	8
Bibliography	1
Figure 1 – Typical "standard" profile	7
Figure 2 – Typical "anti-fog" profile "P"	7
Figure 3 – Typical "aerodynamic" profile "D"	7
Figure 4 – Typical "two-alternating" profile "V"	7
Figure 5 – Typical "three-alternating" profile "T"	8
Figure 6 – String insulator unit of standard and anti-fog profile with ball and socket coupling	8
Figure 7 – String insulator unit of standard and anti-fog profile with clevis and tongue coupling	10
Figure 8 – String insulator unit of aerodynamic profile with ball and socket coupling	11
Figure 9 – String insulator unit of two-alternating profile with ball and socket coupling	11
Figure 10 – String insulator unit of three-alternating profile with ball and socket coupling	12
Table 1 – Specified values of mechanical and dimensional characteristics for string insulator units of standard and anti-fog profile with ball and socket couplings	9
Table 2 – Specified values of mechanical and dimensional characteristics for string insulator units of standard and anti-fog profile with clevis and tongue couplings	10
Table 3 – Specified values of mechanical and dimensional characteristics for string insulator units of aerodynamic profile with ball and socket couplings	11
Table 4 – Specified values of mechanical and dimensional characteristics for string insulator units of two-alternating profile with ball and socket couplings	12
Table 5 – Specified values of mechanical and dimensional characteristics for string insulator units of three-alternating profile with ball and socket couplings	13

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INSULATORS FOR OVERHEAD LINES WITH
A NOMINAL VOLTAGE ABOVE 1 000 V –
CERAMIC OR GLASS INSULATOR UNITS FOR AC SYSTEMS –
CHARACTERISTICS OF INSULATOR UNITS OF THE CAP AND PIN TYPE**

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, accept 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 60305 has been prepared by IEC technical committee 36: Insulators.

This fifth edition cancels and replaces the fourth edition published in 1995. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) wording in Scope changed from "it is recommended" to "it is applicable";
- b) new normative references added;
- c) electromechanical or mechanical failing load in Clause 4 specified;
- d) new figures added showing profiles;
- e) Tables 1, 2, 3, 4 and 5 expanded to include more specified values.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
36/499/FDIS	36/501/RVD

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

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

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

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

INSULATORS FOR OVERHEAD LINES WITH A NOMINAL VOLTAGE ABOVE 1 000 V – CERAMIC OR GLASS INSULATOR UNITS FOR AC SYSTEMS – CHARACTERISTICS OF INSULATOR UNITS OF THE CAP AND PIN TYPE

1 Scope

This International Standard applies to string insulator units of the cap and pin type with insulating parts of ceramic material or glass, intended for AC overhead lines with a nominal voltage greater than 1 000 V and a frequency not greater than 100 Hz. It also applies to insulators of similar design used in substations.

This document applies to string insulator units of the cap and pin type either with ball and socket couplings or with clevis and tongue couplings.

This document applies to string insulator units for use on overhead lines in clean areas and polluted areas. For use in areas characterized by very heavy pollution levels and for other particular or extreme environmental conditions, it may be necessary for certain dimensions to be changed and insulator units having different creepage distances, spacing and forms may be preferred (for example, flat profile, hemispherical etc.). Insulators for use on DC systems may also need different dimensions. In any case, it is applicable that the standardized mechanical characteristics of this document and coupling size are retained.

The object of this document is to prescribe specific values for the mechanical characteristics and for the main dimensions of string insulator units of the cap and pin type.

The power frequency, lightning impulse and puncture withstand voltages of string insulator units are not specified in this document. IEC 60383-1 gives the electrical characteristics which define string insulator units; their values are agreed between purchaser and manufacturer.

Ball and socket couplings are covered by IEC 60120, clevis and tongue couplings by IEC 60471.

NOTE For the definition of site pollution severity see IEC TS 60815-1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 60383-1, *Insulators for overhead lines with a nominal voltage above 1000 V – Part 1: Ceramic or glass insulator units for AC systems – Definitions, test methods and acceptance criteria*

3 Terms and definitions

No terms and definitions are listed in this document.