IEEE SA
STANDARDS
ASSOCIATION

IEEE Standard for Pole-Mounted Equipment—Enclosure Integrity

STANDARDS

IEEE Power and Energy Society

REDLINE
Shows changes from the previous version!

Developed by the
Transformers Committee
and the
Switchgear Committee

IEEE Std C57.12.31™-2020
(Revision of IEEE Std C57.12.31-2010)

IEEE

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 19:32:24 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C57.12.31-2020

IEEE Std C57.12.31™-2020
(Revision of IEEE Std C57.12.31-2010)

IEEE Standard for Pole-Mounted Equipment—Enclosure Integrity

Developed by the

Transformers Committee
and the
Switchgear Committee
of the
IEEE Power and Energy Society

Approved 3 December 2020

IEEE SA Standards Board

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 19:32:24 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C57.12.31-2020

THIS IS A REDLINE DOCUMENT PRODUCED BY TECHSTREET, AN ASME COMPANY.

This document is intended to provide users with an indication of changes from one edition to the next. It includes a full-text version of the new document, plus an indication of changes from the previous version.

Redlines are designed to save time and improve efficiencies by using the latest software technology to find and highlight document changes. More professionals are using valuable new technologies like redlines, to help improve outcomes in a fast paced global business world.

Because it may not be technically possible to capture all changes accurately, it is recommended that users consult previous editions as appropriate. In all cases, only the current base version of this publication is to be considered the official document.

This Redline is produced solely by Techstreet. IEEE has not prepared this Redline and is not responsible for its accuracy.

Documents
Document Sharing Hub

445 Hoes Lane, Piscataway, NJ 08854 USA | http://standards.ieee.org | Tel. +1 732-981-0060 Fax +1 732-562-1571

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 19:32:24 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C57.12.31-2020

Redline Processing Notes:

1. ~~**Red Text**~~ - Red strikethrough text denotes deletions.

2. **Blue Text** - Blue underlined text denotes modifications and additions.

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 19:32:24 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C57.12.31-2020

Abstract: Conformance tests and requirements for the coating integrity of carbon steel pole-mounted enclosures containing apparatus energized in excess of 600 V, and not for application in coastal or other severe environments, are specified in this standard. These enclosures are typically located out of reach of the general public, and include, but are not limited to, the following types of equipment enclosures: pole-mounted distribution transformers, pole-mounted switches, pole-mounted regulators, pole-mounted metering equipment, pole-mounted reclosers, and pole-mounted switchgear.

Keywords: coating integrity, enclosure integrity, IEEE C57.12.31™, pole-mounted equipment, switches, transformers

The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA

Copyright © 2021 by The Institute of Electrical and Electronics Engineers, Inc.
All rights reserved. Published 26 February 2021. Printed in the United States of America.

IEEE is a registered trademark in the U.S. Patent & Trademark Office, owned by The Institute of Electrical and Electronics Engineers, Incorporated.

PDF: ISBN 978-1-5044-7267-8 STD24540
Print: ISBN 978-1-5044-7268-5 STDPD24540

IEEE prohibits discrimination, harassment, and bullying.
For more information, visit https:/www.ieee.orgabout/corporate/governance/p9-26.html.
No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

Documents
Document Sharing Hub

Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 19:32:24 UTC from IEEE Xplore. Restrictions apply.

Full document details: IEEE C57.12.31-2020

Important Notices and Disclaimers Concerning IEEE Standards Documents

IEEE Standards documents are made available for use subject to important notices and legal disclaimers. These notices and disclaimers, or a reference to this page (https://standards.ieee.org/ipr/disclaimers.html), appear in all standards and may be found under the heading "Important Notices and Disclaimers Concerning IEEE Standards Documents."

Notice and Disclaimer of Liability Concerning the Use of IEEE Standards Documents

IEEE Standards documents are developed within the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association (IEEE SA) Standards Board. IEEE develops its standards through an accredited consensus development process, which brings together volunteers representing varied viewpoints and interests to achieve the final product. IEEE Standards are documents developed by volunteers with scientific, academic, and industry-based expertise in technical working groups. Volunteers are not necessarily members of IEEE or IEEE SA, and participate without compensation from IEEE. While IEEE administers the process and establishes rules to promote fairness in the consensus development process, IEEE does not independently evaluate, test, or verify the accuracy of any of the information or the soundness of any judgments contained in its standards.

IEEE makes no warranties or representations concerning its standards, and expressly disclaims all warranties, express or implied, concerning this standard, including but not limited to the warranties of merchantability, fitness for a particular purpose and non-infringement. In addition, IEEE does not warrant or represent that the use of the material contained in its standards is free from patent infringement. IEEE standards documents are supplied "AS IS" and "WITH ALL FAULTS."

Use of an IEEE standard is wholly voluntary. The existence of an IEEE Standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard.

In publishing and making its standards available, IEEE is not suggesting or rendering professional or other services for, or on behalf of, any person or entity, nor is IEEE undertaking to perform any duty owed by any other person or entity to another. Any person utilizing any IEEE Standards document, should rely upon his or her own independent judgment in the exercise of reasonable care in any given circumstances or, as appropriate, seek the advice of a competent professional in determining the appropriateness of a given IEEE standard.

IN NO EVENT SHALL IEEE BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO: THE NEED TO PROCURE SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE PUBLICATION, USE OF, OR RELIANCE UPON ANY STANDARD, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE AND REGARDLESS OF WHETHER SUCH DAMAGE WAS FORESEEABLE.

Translations

The IEEE consensus development process involves the review of documents in English only. In the event that an IEEE standard is translated, only the English version published by IEEE is the approved IEEE standard.

Documents
Document Sharing Hub
Copyright © 2021 IEEE. All rights reserved.
Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 19:32:24 UTC from IEEE Xplore. Restrictions apply.
Full document details: IEEE C57.12.31-2020

Official statements

A statement, written or oral, that is not processed in accordance with the IEEE SA Standards Board Operations Manual shall not be considered or inferred to be the official position of IEEE or any of its committees and shall not be considered to be, nor be relied upon as, a formal position of IEEE. At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that the presenter's views should be considered the personal views of that individual rather than the formal position of IEEE, IEEE SA, the Standards Committee, or the Working Group.

Comments on standards

Comments for revision of IEEE Standards documents are welcome from any interested party, regardless of membership affiliation with IEEE or IEEE SA. However, **IEEE does not provide interpretations, consulting information, or advice pertaining to IEEE Standards documents**.

Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments. Since IEEE standards represent a consensus of concerned interests, it is important that any responses to comments and questions also receive the concurrence of a balance of interests. For this reason, IEEE and the members of its Societies and Standards Coordinating Committees are not able to provide an instant response to comments, or questions except in those cases where the matter has previously been addressed. For the same reason, IEEE does not respond to interpretation requests. Any person who would like to participate in evaluating comments or in revisions to an IEEE standard is welcome to join the relevant IEEE working group. You can indicate interest in a working group using the Interests tab in the Manage Profile and Interests area of the IEEE SA myProject system. An IEEE Account is needed to access the application.

Comments on standards should be submitted using the Contact Us form.

Laws and regulations

Users of IEEE Standards documents should consult all applicable laws and regulations. Compliance with the provisions of any IEEE Standards document does not constitute compliance to any applicable regulatory requirements. Implementers of the standard are responsible for observing or referring to the applicable regulatory requirements. IEEE does not, by the publication of its standards, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Data privacy

Users of IEEE Standards documents should evaluate the standards for considerations of data privacy and data ownership in the context of assessing and using the standards in compliance with applicable laws and regulations.

Copyrights

IEEE draft and approved standards are copyrighted by IEEE under US and international copyright laws. They are made available by IEEE and are adopted for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of engineering practices and methods. By making these documents available for use and adoption by public authorities and private users, IEEE does not waive any rights in copyright to the documents.

Copyright © 2021 IEEE. All rights reserved.
Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 19:32:24 UTC from IEEE Xplore. Restrictions apply.
Documents
Document Sharing Hub
Full document details: IEEE C57.12.31-2020

Photocopies

Subject to payment of the appropriate licensing fees, IEEE will grant users a limited, non-exclusive license to photocopy portions of any individual standard for company or organizational internal use or individual, non-commercial use only. To arrange for payment of licensing fees, please contact Copyright Clearance Center, Customer Service, 222 Rosewood Drive, Danvers, MA 01923 USA; +1 978 750 8400; https://www.copyright.com/. Permission to photocopy portions of any individual standard for educational classroom use can also be obtained through the Copyright Clearance Center.

Updating of IEEE Standards documents

Users of IEEE Standards documents should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of amendments, corrigenda, or errata. An official IEEE document at any point in time consists of the current edition of the document together with any amendments, corrigenda, or errata then in effect.

Every IEEE standard is subjected to review at least every 10 years. When a document is more than 10 years old and has not undergone a revision process, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of any IEEE standard.

In order to determine whether a given document is the current edition and whether it has been amended through the issuance of amendments, corrigenda, or errata, visit IEEE Xplore or contact IEEE. For more information about the IEEE SA or IEEE's standards development process, visit the IEEE SA Website.

Errata

Errata, if any, for all IEEE standards can be accessed on the IEEE SA Website. Search for standard number and year of approval to access the web page of the published standard. Errata links are located under the Additional Resources Details section. Errata are also available in IEEE Xplore. Users are encouraged to periodically check for errata.

Patents

IEEE Standards are developed in compliance with the IEEE SA Patent Policy.

Attention is called to the possibility that implementation of this standard may require use of subject matter covered by patent rights. By publication of this standard, no position is taken by the IEEE with respect to the existence or validity of any patent rights in connection therewith. If a patent holder or patent applicant has filed a statement of assurance via an Accepted Letter of Assurance, then the statement is listed on the IEEE SA Website at https://standards.ieee.org/about/sasb/patcom/patents.html. Letters of Assurance may indicate whether the Submitter is willing or unwilling to grant licenses under patent rights without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination to applicants desiring to obtain such licenses.

Essential Patent Claims may exist for which a Letter of Assurance has not been received. The IEEE is not responsible for identifying Essential Patent Claims for which a license may be required, for conducting inquiries into the legal validity or scope of Patents Claims, or determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance, if any, or in any licensing agreements are reasonable or non-discriminatory. Users of this standard are expressly advised that determination of the validity of any patent rights, and the risk of infringement of such rights, is entirely their own responsibility. Further information may be obtained from the IEEE Standards Association.

Copyright © 2021 IEEE. All rights reserved.
Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 19:32:24 UTC from IEEE Xplore. Restrictions apply.
Documents
Document Sharing Hub
Full document details: IEEE C57.12.31-2020

IMPORTANT NOTICE

IEEE Standards do not guarantee or ensure safety, security, health, or environmental protection, or ensure against interference with or from other devices or networks. IEEE Standards development activities consider research and information presented to the standards development group in developing any safety recommendations. Other information about safety practices, changes in technology or technology implementation, or impact by peripheral systems also may be pertinent to safety considerations during implementation of the standard. Implementers and users of IEEE Standards documents are responsible for determining and complying with all appropriate safety, security, environmental, health, and interference protection practices and all applicable laws and regulations.

Documents
Document Sharing Hub
Copyright © 2021 IEEE. All rights reserved.
Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 19:32:24 UTC from IEEE Xplore. Restrictions apply.
Full document details: IEEE C57.12.31-2020

Participants

At the time this IEEE standard was completed, the Enclosure Integrity Working Group had the following membership:

Dan Mulkey, *Chair*
Jeremy Van Horn, *Vice Chair*
Audrey Siebert-Timmer, *Secretary*

Scott Abbott
Glenn Andersen
Jason Attard
Martin Bachand
Israel Barrientos
David Blew
Darren Brown
Thomas Callsen
John Chisholm
Rhett Chrysler
Douglas Craig
John Crotty
Michael Dahlke
Thomas Dauzat
Anil Dhawan
James Dorsten
William Elliott
Matthew Enders
Ben Garcia
James Gardner
Carlos Gaytan
Ali Ghafourian
Said Hachichi
Kenneth Hampton
Gael Kennedy
Gary King
Brad Kittrell
Brian Klaponski
Maria Lamorey
Alejandro Macias
Justin Minikel
Charles Morgan
Michael Morgan
Jerry Murphy
Dwight Parkinson
Ion Radu
Juan Ramirez
James Ratty
Martin Rave
Pedro Salgado
Stephen Shull
Igor Simonov
James Spaulding
Edward Smith
Travis Spoone
Robert Stinson
Liz Sullivan
Babanna Suresh
Giuseppe Termini
Michael Thibault
Robert Tinsley
Alan Traut
Donnie Trivitt
Reinaldo Valentin
John Vartanian
Joshua Verdell
Shelby Walters
Lee Welch
Alan Wilks
William Wimmer

The following members of the individual Standards Association balloting group voted on this standard. Balloters may have voted for approval, disapproval, or abstention.

Steven Alexanderson
Nabi Almeida
Peter Balma
Barry Beaster
David Beseda
Wallace Binder
Thomas Blackburn
William Bloethe
Darren Brown
Demetrio Bucaneg Jr.
William Byrd
Thomas Callsen
Paul Cardinal
Kurt Clemente
Michael Culhane
Jorge Fernandez Daher
Thomas Dauzat
Edgar Dullni
William Elliott
Michael Faulkenberry
Paul Found
Fredric Friend
Benjamin Garcia
Jalal Gohari
Edwin Goodwin
Randall Groves
Said Hachichi
Randy Hamilton
John Harley
Thang Hochanh
Werner Hoelzl
Philip Hopkinson
Mohammad Iman
Gael Kennedy
Sheldon Kennedy
Gary King
Jim Kulchisky
Chung-Yiu Lam
Tim-Felix Mai
Lee Matthews
Mark McNally
Charles Morgan
Daniel Mulkey
Jerry Murphy
K.R.M. Nair
Dennis Neitzel
Tim Olson
Lorraine Padden
Dwight Parkinson
Bansi Patel
Dhiru Patel
Alvaro Portillo
Jarrod Prince
Martin Rave
Oleg Roizman
Daniel Sauer
Bartien Sayogo
Stephen Shull
James Smith
Jerry Smith
Gary Smullin
Steve Snyder
Robert Stinson
Gary Stoedter
David Tepen
Alan Traut
Karla Trost
Jason Varnell
John Vartanian
Roger Verdolin
John Vergis
Jim Vo

Copyright © 2021 IEEE. All rights reserved.
Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 19:32:24 UTC from IEEE Xplore. Restrictions apply.
Documents
Document Sharing Hub
Full document details: IEEE C57.12.31-2020

David Wallace	Kenneth White	Sandeep Zope
	Alan Wilks	

When the IEEE SA Standards Board approved this standard on 3 December 2020, it had the following membership:

Gary Hoffman, *Chair*
Jon Walter Rosdahl, *Vice Chair*
John D. Kulick, *Past Chair*
Konstantinos Karachalios, *Secretary*

Ted Burse	David J. Law	Mehmet Ulema
Doug Edwards	Howard Li	Lei Wang
J.Travis Griffith	Dong Liu	Sha Wei
Grace Gu	Kevin Lu	Philip B. Winston
Guido R. Hiertz	Paul Nikolich	Daidi Zhong
Joseph L. Koepfinger*	Damir Novosel	Jingyi Zhou
	Dorothy Stanley	

*Member Emeritus

Copyright © 2021 IEEE. All rights reserved.
Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 19:32:24 UTC from IEEE Xplore. Restrictions apply.
Documents
Document Sharing Hub
Full document details: IEEE C57.12.31-2020

Introduction

This introduction is not part of IEEE Std C57.12.31-2020, IEEE Standard for Pole-Mounted Equipment—Enclosure Integrity.

The Accredited Standards Committee on Transformers, Regulators, and Reactors, C57, originally developed and correlated standards on these products, together with the Accredited Standards Committee on Power Switchgear, C37, through the Joint ASC C57/C37 Working Group on Enclosures with Joseph Martin and then with Robert C. Olen as chairman. This group is now the Enclosure Integrity Working Group of the IEEE Transformers Committee.

The data used in this work have been gathered from many sources, including the standards of the Institute of Electrical and Electronics Engineers and the National Electrical Manufacturers Association, reports of committees of the Edison Electric Institute, and others.

In this revision of the guide a Word usage clause was added, additional definitions were added, and a new coating touch up clause and normative reference were added. Further, the purpose of each test was clarified, and the standard was generally updated and clarified.

Copyright © 2021 IEEE. All rights reserved.
Authorized licensed use limited to: Tsinghua University. Downloaded on February 26,2026 at 19:32:24 UTC from IEEE Xplore. Restrictions apply.
Full document details: IEEE C57.12.31-2020