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IEEE Standard for Test Procedures and Requirements for Alternating-Current Cable Terminations Used on Shielded Cables Having Laminated Insulation Rated 2.5 kV through 765 kV or Extruded Insulation Rated 2.5 kV through 500 kV

IEEE Power and Energy Society

Developed by the
Insulated Conductors Committee

IEEE Std 48™-2020
(Revision of
IEEE Std 48-2009)

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Abstract: Test procedures and requirements are provided for all indoor and outdoor cable terminations used on alternating-current shielded cables having laminated insulation rated 2.5 kV through 765 kV and extruded insulation rated 2.5 kV through 500 kV, except separable insulated connectors, which are covered by IEEE Std 386™-2016 [B18]. Cable terminations and component parts shall be capable of withstanding the tests specified in this standard.

Keywords: accelerated contamination testing, correction factors, dielectric field tests, environmental exposure, IEEE 48™, nonstandard service conditions, rating, solar radiation, standard service conditions, test requirements, ultraviolet light

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Introduction

This introduction is not part of IEEE Std 48™-2020, IEEE Standard for Test Procedures and Requirements for Alternating-Current Cable Terminations Used on Shielded Cables Having Laminated Insulation Rated 2.5 kV through 765 kV or Extruded Insulation Rated 2.5 kV through 500 kV.

This standard supersedes IEEE Std 48-2009, IEEE Standard Test Procedures and Requirements for Alternating-Current Cable Terminations 2.5 kV through 765 kV.

This standard has been harmonized with IEEE Std 404™-2012 [B22][1] to allow for simultaneous testing of terminations and joints.

Definitions specific to this standard are contained in Clause 3 and Annex B. All other definitions and terminology used herein can be found in *IEEE Standards Dictionary Online*.[2]

In Clause 3 several definitions have been added: basic lightning impulse insulation level (BIL), basic switching impulse insulation level (BSL), family of terminations, and insulation class.

Clause 4, Service conditions, has been updated with an expanded temperature range.

Clause 5, Rating, has been updated and simplified.

Clause 6, Product markings, has been substantially rewritten.

DC voltage design tests have been removed from 7.1. Family of terminations and range of approval requirements have been added to 7.1.

In Table 1, Table 2, and Table 3, dc voltage tests have been eliminated.

In Table 1, Note 13 has been added with respect to requirements for tubular terminations intended for application only within switchgear.

Table 5 has been replaced with Figure 1 and Figure 2. Table 6 has been replaced with Figure 3 and Figure 4.

Sublause 8.4.1.5, related to dc voltage testing, has been removed.

The content of Clause 9 has been moved to IEEE Std 1637™ [B23].

Annex C has been added to contain information regarding dc voltage tests.

[1]The numbers in brackets correspond to those of the bibliography in Annex A.
[2]*IEEE Standards Dictionary Online* is available at: http://dictionary.ieee.org. An IEEE Account is required for access to the dictionary, and one can be created at no charge on the dictionary sign-in page.

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IEEE Standard for Test Procedures and Requirements for Alternating-Current Cable Terminations Used on Shielded Cables Having Laminated Insulation Rated 2.5 kV through 765 kV or Extruded Insulation Rated 2.5 kV through 500 kV

1. Overview

1.1 Scope

This standard covers all indoor and outdoor cable terminations used on alternating-current shielded cables having laminated insulation from 2.5 kV through 765 kV and extruded insulation rated 2.5 kV through 500 kV, except separable insulated connectors, which are covered by IEEE Std 386™-2016 [B18].[3]

Cable terminations and component parts shall be capable of withstanding the tests specified in this standard.

1.2 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (shall equals is required to).[4, 5]

The word *should* indicates that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (should equals is recommended that).

The word *may* is used to indicate a course of action permissible within the limits of the standard (may equals is permitted to).

The word *can* is used for statements of possibility and capability, whether material, physical, or causal (can equals is able to).

[3]The numbers in brackets correspond to those of the bibliography in Annex A.
[4]The use of the word must is deprecated and cannot be used when stating mandatory requirements, must is used only to describe unavoidable situations.
[5]The use of will is deprecated and cannot be used when stating mandatory requirements, will is only used in statements of fact.