

IEEE Standard for High-Voltage Direct-Current (HVDC) Composite Post Insulators

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IEEE Standard for High-Voltage Direct-Current (HVDC) Composite Post Insulators

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IEEE-SA Board of Governors

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Abstract: Outdoor and indoor composite station post insulators used in high-voltage direct-current power transmission systems are covered in this standard. The composite station post insulators covered by this standard consist of a load-bearing insulating core (or tube), a housing (outside the insulating solid core or tube) made of elastomer material (e.g., silicone or ethylene-propylene), and end fittings attached to the insulating core (or tube).

Keywords: composite station post insulator, core (or tube) material, electrical performance, HVDC, IEEE 1898™, mechanical performance, tracking and erosion

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Introduction

This introduction is not part of IEEE Std 1898-2016, IEEE Standard for High-Voltage Direct-Current (HVDC) Composite Post Insulators.

This standard was prepared by the Working Group P1898 to establish standard specifications for high-voltage direct-current (HVDC) composite post insulators. Although composite post insulators for HVDC applications have been built and operated for over several years, only a limited number of papers, guides and standards are available and can be directly used for the manufacturing and testing of such insulators. The IEC polymeric insulator standard IEC 62217:2012 also covers insulators used in dc applications; however, a tracking and erosion test procedure for dc applications is not specified. Given the increased activity in HVDC transmission, a significant need has arisen for a standard that specifically covers the requirements and testing of composite post insulators for HVDC applications.

Significant accomplishments of this standard include the following:

- a) Establishment of a tracking and erosion test for HVDC composite post insulators
- b) Integration of test methodology for composite insulators with ceramic core, resin-impregnated fibers solid core, and hollow insulator

The purpose of this document is to define the requirements and test code for HVDC composite post insulators. This standard utilizes feedback from manufacturers and end users. Radio interference and corona tests are not specified in this standard because the radio interference and corona performances are not characteristics of the insulator alone.

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IEEE Standard for High-Voltage Direct-Current (HVDC) Composite Post Insulators

1. Scope

The standard describes the terms and definition, use condition, technical requirement, and test methods of composite post insulators for high-voltage direct-current (HVDC) power transmission systems up to ± 800 kV.

This standard applies to outdoor and indoor composite station post insulators used in HVDC power transmission systems. The composite station post insulators covered by this standard consist of a load-bearing insulating core (or tube), a housing (outside the insulating solid core or tube) made of elastomer material (e.g., silicone or ethylene-propylene), and end fittings attached to the insulating core (or tube).

This standard covers the following three types of post insulators:

- a) Composite post insulator with a ceramic core
- b) Composite post insulator with a resin impregnated fibers solid core
- c) Composite gas-filled hollow post insulator

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

CIGRE Technical Brochure 361:2008, Outdoor Insulation in Polluted Conditions: Guidelines for Selection and Dimensioning—Part 1: General principles and the AC case.¹

CIGRE Technical Brochure 555:2013, Artificial Pollution Test for Polymer Insulators.

IEC 60071-1:2006, Insulation co-ordination—Part 1: Definitions, principles and rules.²

IEC 60071-2:1996, Insulation co-ordination—Part 2: Application guide.

¹CIGRE publications are available from the Council on Large Electric Systems (<http://www.e-cigre.org/>).

²IEC publications are available from the International Electrotechnical Commission (<http://www.iec.ch>) and the American National Standards Institute (<http://www.ansi.org/>).