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IEEE Guide for Energy Efficiency Technology Evaluation of Electric Power Fittings

IEEE Power and Energy Society

Developed by the
Transmission and Distribution Committee

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IEEE

STANDARDS

IEEE Guide for Energy Efficiency Technology Evaluation of Electric Power Fittings

Developed by the

Transmission and Distribution Committee
of the
IEEE Power and Energy Society

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IEEE SA Standards Board

Abstract: This guide describes the energy efficiency technology evaluation of electric power fittings. It is applicable to electric power fittings in direct contact with electric power conductors.

Keywords: electric power fittings, energy efficiency technology evaluation, IEEE 2747™

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Introduction

This introduction is not part of IEEE Std 2747-2020, IEEE Guide for Energy Efficiency Technology Evaluation of Electric Power Fittings.

This guide was prepared by the Fittings Energy Consumption Working Group to establish standard specifications for electric power fittings that are in direct contact with electric power conductors.

The purpose of this guide is to provide the requirements and testing procedures for the energy loss test and energy efficiency technology evaluation of electric power fittings.

Caution is advised to avoid misuse of the results of energy loss measurements. For example, non-ferrous current-carrying connectors are required by existing standards to have lower resistance, and therefore lower energy loss, than the same length of conductor. It could be assumed that energy loss is reduced by using more connectors. However, connectors are a point of failure, and their use should be minimized in the interest of reliability.

Connector energy loss and connector reliability are not correlated. For example, large compression connectors have a resistance of approximately 40% of the free-span conductor of length equal to the connector length. Large compression connectors are widely used, and their failure rate has a dominant impact on the reliability of overhead lines. Newer connector designs, including radial-swage connectors and implosion connectors, by contrast, exhibit significantly lower failure rates in both field and laboratory testing. The connector resistance for newer designs is approximately 80% of the resistance of a free-span conductor of equal length. This means the energy loss is greater for the compression connectors, though it is of note that the loss is still lower than the loss from the same length of free-span conductors. Connector selection should therefore be based on reliability, with energy loss considered only if reliability is equal or better.

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IEEE Guide for Energy Efficiency Technology Evaluation of Electric Power Fittings

1. Overview

1.1 Scope

This guide describes the energy efficiency technology evaluation of electric power fittings. It is applicable to electric power fittings that are in direct contact with electric power conductors.

1.2 Purpose

The purpose of this guide is to provide the basis for energy loss test and energy efficiency technology evaluation of electric power fittings. This guide provides technical support for the reduction of power grid loss and the expansion of power grid capacity. It promotes the technical progress of production enterprises for energy efficiency fittings.

1.3 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*).[1,2]

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*).

[1]The use of the word *must* is deprecated and cannot be used when stating mandatory requirements, *must* is used only to describe unavoidable situations.
[2]The use of *will* is deprecated and cannot be used when stating mandatory requirements, *will* is only used in statements of fact.