SLOVENSKI STANDARD
kSIST FprEN 3475-307:2014

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Aeronavtika - Električni kabli za uporabo v zračnih plovilih - Preskusne metode - 307. del: Napetost koronske izgube

Aerospace series - Cables, electrical, aircraft use - Test methods - Part 307: Corona extinction voltage

Luft- und Raumfahrt - Elektrischen Leitungen für Luftfahrt Verwendung - Prûfverfahren - Teil 307: Korona-Aussetzspannung

Série aérospatiale - Câbles électriques à usage aéronautique - Méthodes d'essais - Partie 307: Tension d'extinction corona

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Aerospace series - Cables, electrical, aircraft use - Test methods - Part 307: Corona extinction voltage

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This draft European Standard is submitted to CEN members for formal vote. It has been drawn up by the Technical Committee ASD-STAN.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (FprEN 3475-307:2014) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This document is currently submitted to the Formal Vote.

This document will supersede EN 3475-307:2010.

Introduction

For an electrical cable, the presence of partial discharges effects at operating voltage may result in a significant reduction of service life.

Some insulation materials are more susceptible to such discharge damage than others.

Evidence of partial discharges during operation signifies for example:

— the insulation thickness is insufficient for the applied voltage;

— the quality of the insulation is inadequate possibly due to excessive size or quantities of internal cavities or voids;

— an overstress is present, resulting in a local reduction of the cable insulation properties.

Significant parameters may influence PDIV and PDEV such as pressure, temperature, humidity, previous electrification, input signal characteristics (sine wave, voltage rate, ...). Attention shall be given to installation conditions in A/C, for example excessive bending or surface wrinkling of insulation shall be avoided.

Up to few tens of kHz frequency can be considered as non-significant parameter.

1 Scope

This European Standard defines methods to cover the detection and measurement of partial discharge (corona) under an applied test voltage, including the determination of partial discharges (corona) inception and extinction voltages as the test voltage is raised and lowered, of electrical cables for aircraft use.

It shall be used together with EN 3475-100.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 2235, *Aerospace series — Single and multicore electrical cables, screened and jacketed*

EN 3475-100, *Aerospace series — Cables, electrical, aircraft use — Test methods — Part 100: General*

EN 60270, *High-voltage test techniques — Partial discharge measurements*

ASTM D 1868, *Standard Test method for Detection and Measurement of Partial Discharge (Corona) Pulses in Evaluation of Insulation Systems* [1)]

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
Partial Discharge Inception Voltage
PDIV
lowest voltage at which continuous (steady state with a minimum of 1 detected Partial discharge per second) partial discharges occur as the applied voltage is increased

3.2
Partial Discharge Extinction Voltage
PDEV
highest voltage at which partial discharges no longer occur as the applied voltage is decreased from the inception voltage described before

NOTE 1 to entry More precise information on the partial discharge phenomenon, such as definition, can be found in ASTM D 1868-07 or in EN 60270.

4 Applicability

This test method is suitable for coaxial cables, high voltage cables and for thin wall insulated cables. Methodologies are proposed to cover: coaxial cables (Method A), wires used in altitude (Method B).

1) Published by: ASTM National (US) American Society for Testing and Materials http://www.astm.org/.

5 Apparatus

The equipment shall be capable of detecting partial discharges of five picocoulombs or less.

The detection equipment, cautions and measurement procedures shall be equivalent to those described in ASTM D 1868 or in EN 60270.

The frequency of the test voltage shall be between 48 Hz to 62 Hz.

6 Methods

6.1 General

Two methods are proposed according to specific needs.

Unless otherwise specified in the concerned product standard Method A applies.

The minimum specimen length shall be chosen so that its capacitance is matched to the needs of the detecting equipment to permit observation of discharges of the level described in Clause 5. Use ASTM D 1868 for guidance to determine this length. In any case the minimum length under test shall not be less than 850 mm.

It is particularly important that the ends of specimen to test and that the test bench are corona free.

WARNING — Lethal voltage may be present during this test. It is essential that procedures and test apparatus are properly defined and used for safe operation.

6.2 Method A

6.2.1 Case of use

This method is particularly dedicated to measure PDEV of coaxial cables, under ambient conditions.

6.2.2 Specimen preparation

A suggested method for making the ends corona free is shown on Figure 1 to Figure 3.

Step 1: If compatible with Clause 6 above, suggested length of cable specimen is 1 m.

Step 2: Remove 75 mm of the jacket material from each end.

Dimensions in millimetres

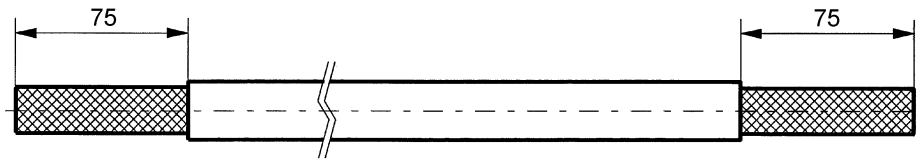

Figure 1