



SLOVENSKI STANDARD

SIST EN 2591-227:2015

01-oktober-2015

Aeronavtika - Elementi električnih in optičnih povezav - Preskusne metode - 227.
del: Preskus delne razelektritve

Aerospace series - Elements of electrical and optical connection - Test methods - Part
227: Partial discharges test

Luft- und Raumfahrt - Elektrische und optische Verbindungselemente - Prüfverfahren -
Teil 227: Teilentladungsprüfung

Série aérospatiale - Organes de connexion électrique et optique - Méthodes d'essais -
Partie 227: Essai de décharges partielles

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Ta slovenski standard je istoveten z: EN 2591-227:2015

ICS:

49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems
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EUROPEAN STANDARD

EN 2591-227

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2015

ICS 49.060; 49.090

English Version

**Aerospace series - Elements of electrical and optical connection
- Test methods - Part 227: Partial discharges test**

Série aérospatiale - Organes de connexion électrique et
optique - Méthodes d'essais - Partie 227 : Essai de
décharges partielles

Luft- und Raumfahrt - Elektrische und optische
Verbindungselemente - Prüfverfahren - Teil 227:
Teilentladungsprüfung

This European Standard was approved by CEN on 5 March 2015.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (EN 2591-227:2015) 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 European 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 European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2016, and conflicting national standards shall be withdrawn at the latest by February 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

For a connector, the presence of partial discharge effects at operating voltage may result in a significant reduction of service life.

Evidence of partial discharges during operation signifies for example:

- distance between contact cavities is insufficient for the applied voltage,
- the quality of the insulation is inadequate possibly due to excessive size of the cavities or voids inside the insulation,
- a leakage way is present, resulting in a local reduction of the connector insulation properties.

The most significant parameters which may influence PDIV, are, when both low pressure and high temperature could be combined (engine area for example).

The aim of this European Standard is to define the test method and procedure which will determine if an electrical connector will be subjected to partial discharges; in particular, when it is exposed to a specified temperature and pressure based on an Aircraft environment.

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1 Scope

This test European Standard defines methods to measure the partial discharge inception/extinction voltages (PDIV, PDEV) and partial discharge levels under specific temperatures and pressures on an electrical connector for aircraft use.

It shall be used together with EN 2591-100.

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 2267-012, *Aerospace series — Cables, electrical, for general purpose — Operating temperatures between – 55 °C and 260 °C — Part 012: DZ family, single UV laser printable for use in low pressure atmosphere — Product standard* ¹⁾

EN 2591-100, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 100: General*

EN 3155 (all parts), *Aerospace series — Electrical contacts used in elements of connection*

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

ASTM D 1868-07, *Standard Test Method for Detection and Measurement of Partial Discharge (Corona) Pulses in Evaluation of Insulation System* ²⁾

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1) Published as ASD-STAN Prestandard at the date of publication of this standard (<http://www.asd-stan.org/>).

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

EN 2591-227:2015 (E)**3 Abbreviations and definitions**

For the purpose of this document, the following abbreviations shall be used:

DUT	Device Under Test
PD	Partial Discharges
PDIV	Partial Discharge Inception Voltage
PDEV	Partial Discharge Extinction Voltage

PDIV is the lowest voltage at which continuous partial discharges occur as the applied voltage is increased.

PDEV is the highest voltage at which partial discharges no longer occur as the applied voltage is decreased from the inception voltage described before.

More precise information on the partial discharge phenomenon can be found in ASTM D 1868-07 or in EN 60270. One definition of partial discharge can be found in 3.1.2 of the ASTM D 1868-07.

Test specimen or DUT: It is a connector (plug or receptacle) compliant to a required definition and configuration.

4 Applicability

This test method is suitable for all types of connector used in un-pressurized area.

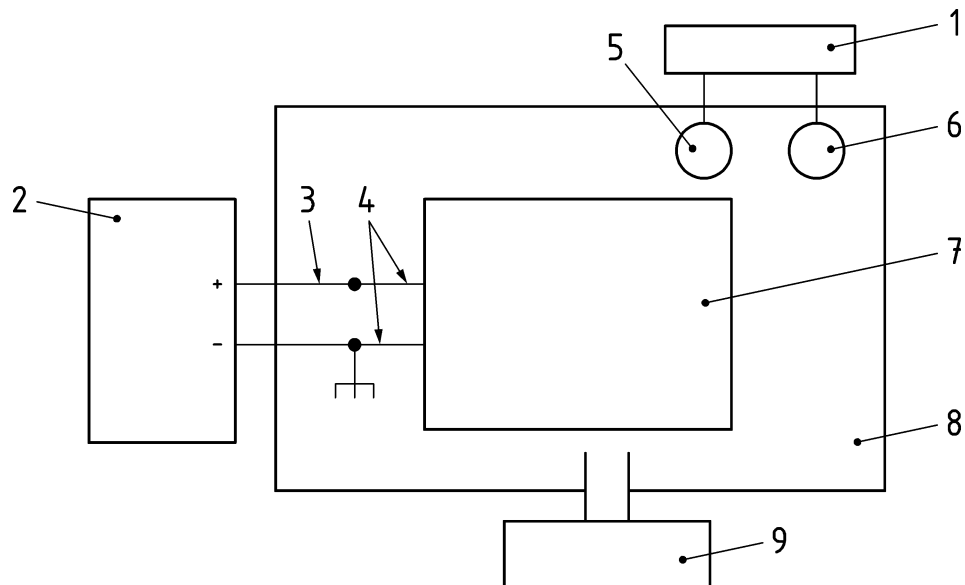
5 Apparatus

The detection equipment shall be capable of detecting partial discharges of five (5) picocoulombs (pC) or less.

The detection equipment, cautions and measurement procedures shall be equivalent to those described in ASTM D 1868-07 or in EN 60270.

The frequency of the test voltage shall be between 48 Hz and 62 Hz, unless otherwise specified by the technical specification.

The apparatus must be capable to generate a combination of low pressure and high temperature, refer to Figure 1.



Key

- 1 Monitoring
- 2 Power supply & DP monitoring
- 3 High immunity cables
- 4 High voltage wires
- 5 Temperature
- 6 Pressure
- 7 DUT (Device Under Test)
- 8 Climatic chamber
- 9 Vacuum pump

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Figure 1 — Example of apparatus principle

6 Test methods

All contacts shall be wired with a wire qualified for high voltage purpose (use of EN 2267-012 standard or similar is recommended).

Measurements shall be performed between the contact inside the concerned cavity and all others surrounding contacts linked together with the shell, if the shell is conductive.

All cavities to test shall take into account the minimum separation distance between them or/and the shell, if the shell is conductive.

It is particularly important that the end of the connected wire shall be made of corona free by the help of additional insulation or separation.

In order to do not disturb the electrical measurements, inside the climatic chamber, it is important to use high immunity cable (i.e.: shielded cables) to ensure the connections between the test specimen and the electrical devices. Therefore the utilization of sharp gripping devices such as crocodile pliers are forbidden for the high immunity cable links.

No cable outlet accessories shall be used as bending and squeezing of the connected wires could be a source of partial discharge and not related to the test specimen itself.