SLOVENSKI STANDARD

SIST EN 2591-220:2006

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Aeronavtika ï Elementi elektriļ nih in optiļ nih povezav ï Preskusne metode ï 220. del: Staranje kontakta in prevodnika s ciklič nimi tokovnimi in temperaturnimi obremenitvami

Aerospace series - Elements of electrical and optical connection - Test methods - Part 220: Contact/conductor joint ageing by current and temperature cycling

Luft- und Raumfahrt - Elektrische und optische Verbindungselemente - Prüverfahren - Teil 220: Alterung von Kontakten und Leiteren durch zyklische Temperatur- und Strombelastung

Série aérospatiale - Organes de connexion électrique et optique - Méthodes d'essais - Partie 220 : Vieillissement des contacts et conducteurs par cyclage en température et en courant

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Aerospace series - Elements of electrical and optical connection - Test methods - Part 220: Contact/conductor joint ageing by current and temperature cycling

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Luft- und Raumfahrt - Elektrische und optische Verbindungselemente - Prüverfahren - Teil 220: Alterung von Kontakten und Leiteren durch zyklische Temperatur- und Strombelastung

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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 Central Secretariat has the same status as the official versions.

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Foreword

This European Standard (EN 2591-220:2005) has been prepared by the European Association of Aerospace Manufacturers - Standardization (AECMA-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 AECMA, 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of an identical text or by endorsement, at the latest by April 2006, and conflicting national standards shall be withdrawn at the latest by April 2006.

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This standard specifies a method to demonstrate the long term electrical stability of the conductor to contact joint in the EN 3155 series of product standards. The thermal cycling test is carried out using a combination of conductor current and “ambient” heat to achieve the appropriate maximum rated operating temperature.

It shall be used together with EN 2591-100.

2 Normative references

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

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

EN 2591-202, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 202: Contact resistance at rated current.*

EN 2591-417, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 417: Tensile strength (crimped connection).*

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

3 Preparation of specimens

A test specimen shall consist of a wired male contact mated with the associated female contact of the same contact and barrel or bucket size (see Figure 1). The cable shall be in accordance with EN 3155-001 and the gauge shall be as specified in the contact product standard. The temperature rating shall be the same as, or exceeding, the maximum stated in the contact product standard.

To assist in the voltage drop measurements during testing, test point connections shall be made to the body of the contact, in the vicinity of the joint, and to the conductor as close as possible to, but not more than 1 mm from, the end of the barrel or bucket.

For the test, a number of identical specimens may be linked together in series. See Clause 4.

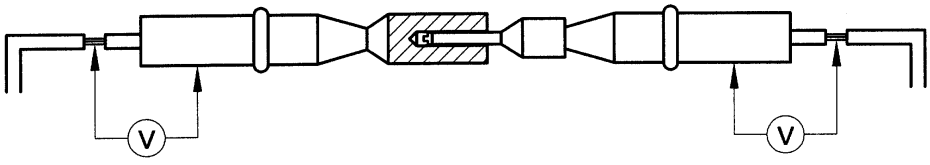

Figure 1 — Test specimen

4 Test method and requirements

A total of 10 specimens shall be prepared for each barrel or bucket size, 50 % using maximum size cable, the balance using a minimum size cable. The sequence of testing shall be as given in Table 1.

Table 1 — Test sequence

Test	Reference	Method	Additional information
Contact resistance at rated current	EN 2591-202	As per EN 3155-001	Contacts are to be in free air and not fitted in a connector.
Load and temperature cycling	See Clause 5		Contacts are to be in free air and not fitted in a connector.
Contact resistance at rated current	EN 2591-202	As per EN 3155-001	See Clause 6. Contacts are to be in free air and not fitted in a connector.
Tensile strength (crimped connection)	EN 2591-417	As per EN 3155-001	

5 Load and temperature cycling test

5.1 The specimens of the same cable size shall be connected in series and a thermocouple attached to a barrel or bucket to monitor the temperature of the contacts in the vicinity of the joints. The specimens shall be placed in an enclosure and the relevant conductor current, as defined in the contact product standard, shall be applied. The temperature within the enclosure shall be raised so that the maximum contact temperature is achieved by the combined heating effect of current and the prevailing “ambient” enclosure temperature.

5.2 The temperature shall be held to within a tolerance ± 5 °C for a maximum of 1 min. This is defined as the "heat-on" period. At the end of the "heat-on" period, the heat and test current shall be removed and all specimens allowed to cool to (25 ± 5) °C. This is the "heat-off" period. Fan assisted cooling is permissible. A "heat-on" and "heat-off" period constitutes one cycle.

5.3 1 000 cycles shall be applied for specimens rated for use below 150 °C and 1 500 cycles for specimens rated for use at 150 °C and above.

6 Measurements and requirements

6.1 The voltage drop across each individual joint shall be measured using the attached test points. An initial measurement shall be made before the commencement of cycling and then after every 100 cycles at a consistent temperature of (25 ± 5) °C on completion of a "heat-off" period.

6.2 During the final 500 cycles of the test, the voltage drop across each joint shall not vary by more than 20 % from the first value obtained during this period.

6.3 The final value of voltage drop across each joint shall not exceed 150 % of the initial voltage drop.

7 Details to be specified

The following details shall be specified:

1. Temperature rating of the cable;
2. Conductor gauge size and stranding;
3. Conductor material and plating;
4. Joining materials or system to be used;
5. Crimp tools and settings, (if applicable).