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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Aircraft — Electrical connectors — Tests

Aéronefs — Connecteurs électriques — Essais

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Reference number
ISO 2100:1987 (E)

Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 2100 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*.

This second edition cancels and replaces the first edition (ISO 2100 : 1972), of which it constitutes a technical revision.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Aircraft — Electrical connectors — Tests

0 Introduction

This International Standard has been prepared to provide a statement of the detailed test procedures and performance requirements for aircraft electrical connectors. It should be read in conjunction with ISO 1949 which specifies the design requirements.

1 Scope and field of application

This International Standard lays down the test procedures and performance requirements for aircraft electrical connectors.

2 References

ISO 1949, *Aircraft — Electrical connectors — Design requirements*.

ISO 2669, *Environmental tests for aircraft equipment — Steady state acceleration*.

ISO/TR 2685, *Aircraft — Environmental conditions and test procedures for airborne equipment — Resistance to fire in designated fire zones*.

ISO 7137, *Aircraft — Environmental conditions and test procedures for airborne equipment*.¹⁾

IEC Publication 512-6, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 6: Climatic tests and soldering tests*.

3 Test details

The tests and performance requirements shall comply with the details given in the table on the following pages.

1) Endorsement, in part, of the publication EUROCAE ED-14B/RTCA DO-160B (a document published jointly by the European Organisation for Civil Aviation Electronics and the Radio Technical Commission for Aeronautics).

Test No.	Title of test	Test procedure	Test results required
1	Engaging and separating (locking and unlocking) forces — connector	Mount fixed items in the normal way. Fully engage and separate the correct mating item in the normal way. Measure the forces of engagement and separation (or locking and unlocking).	The forces shall lie within the limits laid down in the detail specification. Full engagement and separation shall be achieved without the use of tools.
2	Contact resistance	Fully engage the connectors and pass the applicable test current through each contact to be tested until stable conditions are obtained. The test current shall be the d.c. rated current stated in the detail specification. The open circuit voltage of the source shall not exceed 2,5 V. Measure the voltage drop of each contact to be tested and record the results. Special measurements apply to wired contacts which are required to have their resistance recorded for use in later tests. The resistance of the conductor and the crimp or solder joint shall be measured between the conductor extremity and the centre of the crimp or solder barrel, and shall be recorded. Each contact and conductor measured in this way shall be carefully identified before assembly into a connector. The resistance attributable to the conductors and the crimp or solder joint shall be deducted from the overall value obtained in the contact resistance test in order to determine the value applicable to the mating contacts. Final tests in accordance with this procedure, involving comparison, shall be made on the contacts originally tested. These contacts, with their wires, shall then be removed from the connectors and remeasured as above, and the value obtained shall be deducted from the final recordings.	The initial contact resistance shall not exceed the values laid down in the detail specification.
3	Insulation resistance	Measure the insulation resistance using 500 ± 50 V d.c. applied for 1 min between each contact being tested and all others connected together and to the housing and mounting plate. Connect all other contacts to the mounting plate during the test. The conductor connected to the contact being tested may be separated from the remainder of the bunch.	The insulation resistance shall not be less than the values laid down in the detail specification.
4	Shell continuity	Using a d.c. voltage source, the open circuit voltage of which does not exceed 2,5 V, pass a current of 1 A from the cable accessory on one side, through the engaged connector, to the cable accessory on the opposite side. Measure the potential drop between the extremities of both cable accessories. NOTE — This test is not applicable to connectors with a non-conductive finish.	The value shall not exceed that laid down in the detail specification.

Test No.	Title of test	Test procedure	Test results required
5	Sealing	The test described in 5a for non-hermetic connectors shall be carried out at the stated normal temperature $\pm 5^{\circ}\text{C}$, and, if required by the detail specification, at the stated maximum temperature $\pm 5^{\circ}\text{C}$ and the stated minimum temperature $\pm 5^{\circ}\text{C}$. Hermetic connectors shall be tested (see 5b) at normal temperature only.	
5a	Non-hermetic (class S connectors)	Mount fixed items of class S connectors on a jig in the normal way. Such a jig shall be suitable for determining the leakage of air through the component. Apply a differential pressure of 86 to 106 kPa (860 to 1 060 mbar) in one direction. Measure the leakage. Repeat the test with the pressure in the opposite direction. Measure the leakage. The leakage shall include all seals. Means satisfactory to the approving authority shall be provided for determining the air leakage rate.	The recorded leakage rate shall not exceed $1\text{ cm}^3/\text{h}$, expressed at normal temperature and pressure.
5b	Hermetic (class H connectors)	Mount class H connectors in the normal way (e.g. soldered or welded in accordance with the manufacturer's instructions) such that they may be suitably jigged for determining the leakage of pressurized gas through the connector in either direction. Apply a pressure differential of 86 to 106 kPa (860 to 1 060 mbar) in one direction. Measure the leakage. Repeat the test with the pressure in the opposite direction. Measure the leakage. Means satisfactory to the approving authority shall be provided for determining the leakage of pressurized gas through the connector.	The recorded leakage rate shall not exceed $1 \times 10^{-7}\text{ cm}^3/\text{h}$, expressed at normal temperature and pressure.
6	Contact holding force	Six female contacts of each size shall be used for tests 6a and 6b.	
6a	Preconditioning	Precondition the test contacts by hand 10 times, using a gauge of the maximum permitted contact pin diameter.	The female contacts shall retain gauge A and not retain gauge B.
6b	Holding force	Mount the sockets vertically with the mating end down. Insert gauges A and B, each having a surface finish of $0,15\text{ }\mu\text{m}$ to $0,25\text{ }\mu\text{m}$ and of specified mass, in each socket to simulate maximum and minimum diameter pin contacts.	NOTE — The respective diameters, engaged lengths and masses of gauges A and B are to be stipulated in the detail specification.