
International Standard



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Aircraft — Nickel-chromium and nickel-aluminium thermocouple extension cables — Part 1 : Conductors — General requirements and tests

*Aéronefs — Câbles de compensation de couples thermoélectriques en nickel-chrome et en nickel-aluminium — Partie 1 :
Conducteurs — Exigences générales et essais*

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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.

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Aircraft — Nickel-chromium and nickel-aluminium thermocouple extension cables —

Part 1 : Conductors — General requirements and tests

1 Scope and field of application

This part of ISO 8056 specifies the design requirements and tests for the conductors of thermocouple extension cables, using nickel-chromium and nickel-aluminium, for installation in aircraft temperature indicator and control systems.

Methods for determining the thermo-e.m.f. of conductor wires against platinum are given in the annex.

2 References

IEC Publication 564, *D.C. bridges for measuring resistance*.

IPTS 68, *International Practical Temperature Scale of 1968*.

3 Conductor materials

Conductors for use in the construction of thermocouple extension cables for aircraft shall be manufactured from bright, annealed, nickel-chromium (non-magnetic) wires and bright, annealed, nickel-aluminium (magnetic) wires.

They shall comply with the requirements specified in table 1 in terms of d.c. resistance and those in table 2 in terms of thermo-e.m.f. characteristics against platinum over the appropriate temperature range.

Table 3 shows the resistances which have been assumed for nickel-chromium and nickel-aluminium wires in the calculation of d.c. conductor resistances.

A maximum increase in length of 4 %, as a result of stranding, has been assumed for the wires of each conductor.

Each reel or coil of wire to be used in the manufacture of the conductors shall be tested in accordance with 5.1 and 5.2. Finished conductors shall be tested in accordance with 5.3 and 5.4.

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4 Conductor construction

The positive conductor shall consist of stranded, bright, annealed, nickel-chromium alloy wires complying with the requirements of clause 3.

The negative conductor shall consist of stranded, bright, annealed, nickel-aluminium alloy wires complying with the requirements of clause 3.

Joints in single wires shall be welded, brazed or silver-soldered, but the complete conductor shall not be joined. There shall be no kinks, broken wires or other irregularities in the conductors.

5 Tests

5.1 Thermo-electric tests on conductor wires

All wires, before stranding, shall be shown to comply with the requirements specified in table 2 with respect to thermo-e.m.f. against platinum¹⁾ over the range of temperature appropriate to the cable under manufacture.

Measurements shall be made on sample lengths taken from both ends of each reel or coil of wire. A method of direct comparison against platinum, as described in clause A.1, shall be used where single samples are to be tested. Where large numbers of samples are to be tested, a differential method, as described in clause A.2, using substandards of nickel-chromium and nickel-aluminium as appropriate, may be employed. The substandards used shall have known, traceable thermo-electric characteristics against platinum. In the event of a dispute, the direct comparison method shall take precedence.

1) Platinum with a temperature coefficient of resistance not greater than $0,003\,925 \pm 3$ ppm.