

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Overhead lines – Requirements and tests for spacers**

**Lignes aériennes – Exigences et essais applicables aux entretoises**



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IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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**OVERHEAD LINES –  
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International Standard IEC 61854 has been prepared by IEC technical committee 11: Overhead lines.

This second edition cancels and replaces the first edition published in 1998. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Consider the application of spacers on high temperature conductors specifying additional high temperature tests in clamp slip tests and for the characterization of elastic and damping properties;
- b) Specify as far as possible test parameters and acceptance values;
- c) Avoid as far as possible the alternative procedures for the same test;
- d) Introduce a simpler test device for the simulated short circuit current test;
- e) Introduce test at low temperature on fastener components such as break away bolts and conical spring washers;

- f) Prescribe a different procedure for subspan oscillation tests on spacers equipped with clamps having rod attachments;
- g) Modify the test procedure for the aeolian vibration tests;
- h) Prescribe a different procedure for aeolian vibration tests on spacers equipped with clamps having rod attachments;
- i) Re-edit all the figures in order to make them more clear and homogeneous;
- j) Introduce an additional test device for the simulated short circuit current test.

The text of this standard is based on the following documents:

FDIS	Report on voting
11/265/FDIS	11/272/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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## OVERHEAD LINES – REQUIREMENTS AND TESTS FOR SPACERS

### 1 Scope

This document applies to spacers for conductor bundles of overhead lines. It covers rigid spacers, flexible spacers and spacer dampers.

It does not apply to interphase spacers, hoop spacers and bonding spacers.

NOTE This document is written to cover the line design practices and spacers most commonly used at the time of writing. There may be other spacers available for which the specific tests reported in this document may not be applicable.

In some cases, test procedures and test values are left to agreement between purchaser and supplier and are stated in the procurement contract. The purchaser is best able to evaluate the intended service conditions, which should be the basis for establishing the test severity.

In Annex A, the minimum technical details to be agreed between purchaser and supplier are listed.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 60050(466):1990, *International Electrotechnical vocabulary (IEV) – Chapter 466: Overhead lines*

IEC 60888:1987, *Zinc-coated steel wires for stranded conductors*

IEC 61284:1997, *Overhead lines – Requirements and tests for fittings*

ISO 34-1:2015, *Rubber, vulcanized or thermoplastic – Determination of tear strength – Part 1: Trouser, angle and crescent test pieces*

ISO 34-2:2015, *Rubber, vulcanized or thermoplastic – Determination of tear strength – Part 2: Small (Delft) test pieces*

ISO 37:2017, *Rubber, vulcanized or thermoplastic – Determination of tensile stress-strain properties*

ISO 188:2011, *Rubber, vulcanized or thermoplastic – Accelerated ageing or heat resistance tests*

ISO 812:2017, *Rubber, vulcanized or thermoplastic – Determination of low-temperature brittleness*

ISO 815-1:2014, *Rubber, vulcanized or thermoplastic – Determination of compression set – Part 1: At ambient or elevated temperatures*

ISO 815-2:2014, *Rubber, vulcanized or thermoplastic – Determination of compression set – Part 2: At low temperatures*

ISO 868:2003, *Plastics and ebonite – Determination of indentation hardness by means of a durometer (Shore hardness)*

ISO 1183-1: 2019, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method*

ISO 1431-1:2012, *Rubber, vulcanized or thermoplastic – Resistance to ozone cracking – Part 1: Static and dynamic strain testing*

ISO 1461:2009, *Hot dip galvanized coatings on fabricated iron and steel articles – Specifications and test methods*

ISO 1817:2015, *Rubber, vulcanized or thermoplastic – Determination of the effect of liquids*

ISO 2781:2018, *Rubber, vulcanized or thermoplastic – Determination of density*

ISO 2859-1:1999/AMD1: 2011, *Sampling procedures for inspection by attributes – Part 1: Sampling schemes indexed by acceptable quality limit (AQL) for lot-by-lot inspection*

ISO 2859-2:1985, *Sampling procedures for inspection by attributes – Part 2: Sampling plans indexed by limiting quality level (LQ) for isolated lot inspection*

ISO 2921:2011, *Rubber, vulcanized – Determination of low-temperature retraction (TR test)*

ISO 3951-1:2013, *Sampling procedures for inspection by variables -- Part 1: Specification for single sampling plans indexed by acceptance quality limit (AQL) for lot-by-lot inspection for a single quality characteristic and a single AQL*

ISO 3951-2:2013, *Sampling procedures for inspection by variables -- Part 2: General specification for single sampling plans indexed by acceptance quality limit (AQL) for lot-by-lot inspection of independent quality characteristics*

ISO 4649:2017, *Rubber, vulcanized or thermoplastic – Determination of abrasion resistance using a rotating cylindrical drum device*

ISO 4662:2017, *Rubber, vulcanized or thermoplastic – Determination of rebound resilience*

ISO 6502-2:2018, *Rubber – Measurement of vulcanization characteristics using curemeters – Part 2: Oscillating disc curemeter*

ISO 9001:2015, *Quality management systems – Requirements*

### **3 Terms and definitions**

For the purposes of this document, the terms and definitions given in IEC 60050-466 apply as well as the following.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>