

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Overhead lines – Method for fatigue testing of conductors

Lignes aériennes – Méthode d'essai de fatigue des conducteurs



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

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

OVERHEAD LINES – METHOD FOR FATIGUE TESTING OF CONDUCTORS

FOREWORD

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International Standard IEC 62568 has been prepared by IEC technical committee 7: Overhead electrical conductors.

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

| | |
|------------|------------------|
| FDIS | Report on voting |
| 7/638/FDIS | 7/640/RVD |

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INTRODUCTION

Fatigue behaviour of conductors cannot simply be calculated from the fatigue characteristics of the materials used and the stresses that occur. Fatigue characteristics of conductors must be determined by fatigue tests conducted on specific conductor/clamp systems reproducing as closely as possible the field loading conditions. In such tests, the fatigue life must be determined as a function of some measure of vibration intensity rather than of the stress or stress combination that causes the failure.

Fatigue test data are available for only a small fraction of the conductor sizes and types that are in use, and such data are expensive to acquire. Since none of the above parameters is simply related to the fatigue-initiating stresses, results from tests on one conductor size are not necessarily applicable to others.

This IEC Standard is based on these considerations and others explained in Annex A. The user of this standard is encouraged to consult this annex in order to understand the origin of some of the requirements herein.

OVERHEAD LINES – METHOD FOR FATIGUE TESTING OF CONDUCTORS

1 Scope

This International Standard provides test procedures to measure the fatigue characteristics of conductor/clamp systems. For the purposes of this standard, clamps shall be of the metallic type only.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

antinode amplitude

mid-loop single peak vibration amplitude

2.2

bending amplitude

peak-to-peak vibration amplitude of conductor with respect to the clamp, measured 89 mm from the last point of contact between the conductor and the clamp

2.3

failure criterion

benchmark at which the test is deemed terminated.

Note 1 to entry: Two different failure criteria may be chosen:

- a) failure of the first wire, or
- b) failure of three wires or of 10% of the total number of envelope wires for composite conductors, or of the total number of wires for homogeneous conductors

2.4

idealized bending stress

alternating stress amplitude calculated based on the measured bending amplitude

2.5

idealized dynamic stress

alternating stress amplitude calculated based on the measured $f_{y_{max}}$ product

2.6

idealized strain

calculated dynamic bending alternating strain obtained by dividing the idealised stress by the material's modulus of the outer layer material

Note 1 to entry: This calculated idealized strain does not correspond to the strain measured on given wires at the exit of the clamp

2.7

resonance fatigue test

cyclic motion imposed on a conductor in a vertical plane at a resonant frequency of the system