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Edition 2.0 2023-05

INTERNATIONAL STANDARD

Electric cables – Calculation of the current rating – Part 1-2: Current rating equations (100 % load factor) and calculations of losses – Sheath eddy current loss factors for two circuits in flat formation



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ELECTRIC CABLES – CALCULATION OF THE CURRENT RATING –

Part 1-2: Current rating equations (100 % load factor) and calculation of losses – Sheath eddy current loss factors for two circuits in flat formation

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IEC 60287-1-2 has been prepared by IEC technical committee 20: Electric cables. It is an International Standard.

This second edition cancels and replaces the first edition published in 1993. This edition constitutes a technical revision.

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

a) the symbols have been harmonized and aligned with the symbols used in the IEC 60287 and IEC 60853 series.

The text of this International Standard is based on the following documents:

Draft	Report on voting
20/2097/FDIS	20/2104/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60287 series, published under the general title *Electric cables – Calculation of the current rating*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

ELECTRIC CABLES – CALCULATION OF THE CURRENT RATING –

Part 1-2: Current rating equations (100 % load factor) and calculation of losses – Sheath eddy current loss factors for two circuits in flat formation

1 Scope

This part of IEC 60287 provides a method for calculating the eddy current losses in the metallic sheaths of single-core cables arranged as a three-phase double circuit in flat formation. The sheaths are bonded at one point or are cross-bonded so that there are no significant sheath circulating currents. Where metallic sheaths are bonded at both ends there are significant circulating currents which result in a lower current-carrying capacity. A method of calculating circulating current losses for double circuits is provided in IEC 60287-1-3.

The method descibed in this document provides coefficients which are applied as corrections to the loss factors for the sheaths of one isolated three-phase circuit. These corrections are negligible for cables where the parameter m is less than approximately 0,1 ($m = \omega/(R_s \cdot 10^7)$), which corresponds to a sheath longitudinal resistance higher than 314 μΩ/m at 50 Hz.

Consequently, the method is used for most sizes of aluminium-sheathed cables, but is not required for lead-sheathed cables unless they are unusually large.

The coefficients are provided in tabular form and have been computed from fundamental formulae for sheath losses, the evaluation of which calls for expertise in computer programming which will possibly not be readily available in general commercial situations. The development of simplified formulae for some of the tabulated coefficients is under consideration.

Losses for cables in a single circuit is covered in IEC 60287-1-1.

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 60287-1-1:2023, *Electric cables – Calculation of the current rating – Part 1-1: Current rating equations (100 % load factor) and calculation of losses – General*

3 Terms, definitions and symbols

3.1 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology 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