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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 42397-2023

**Calculation of thermally permissible short-circuit currents,
taking into account non-adiabatic heating effects**

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foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules for Standardization Documents" drafting.

This document identically adopts IEC 60949.1988 "Calculation of allowable short-circuit current when considering non-adiabatic effect".

This document adds three chapters of "Scope", "Normative References" and "Terms and Definitions".

The following minimal editorial changes have been made to this document.

---Incorporated the amendments of IEC 60949.1988/Amd1.2008, the outer margin position of the terms involved is vertical

Double lines (||) are marked.

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

1 Scope

This document describes the calculation method of the rated short-circuit current of any current-carrying part of the cable, including the adiabatic method and the non-adiabatic method.

This document applies to the calculation of the rated short-circuit current of cables.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, dated references

For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to

this document.

Note. Conductors of GB/T 3956-2008 cables (IEC 60228.2004, IDT)

IEC 60287-2-1 Cable ampacity calculation Part 2-1.Calculation of thermal resistance (Electriccables-Calculation of

Note. JB/T 10181.21-2014 Cable Ampacity Calculation Part 21.Calculation of Thermal Resistance Thermal Resistance (IEC 60287-2-1.2006, IDT)

3 Terms and Definitions

This document does not have terms and definitions that need to be defined.

4 symbols

The following symbols apply to this document.

A --- Considering the thermal performance constant of surrounding or adjacent materials, $(\text{mm}^2/\text{s})^{1/2}$.

B --- Considering the thermal performance constant of surrounding or adjacent materials, mm^2/s .

C1 --- The constant of conductor and wire shielding (with gap) when calculated by non-adiabatic formula, mm/m .

C2 --- The constant of conductor and wire shielding (with gap) when calculated by non-adiabatic formula, $\text{K}\cdot\text{m}\cdot\text{mm}^2/\text{J}$.

Dit---The diameter of the hypothetical concentric circle that is exactly tangent to the inner

surface of the trough of the corrugated sheath, mm.

Doc --- The diameter of the hypothetical concentric circle that is just tangent to the outer surface of the corrugated sheath crest, mm.

F --- Consider the factor of imperfect thermal contact.

I --- Allowable short-circuit current (effective value during the entire short-circuit period), A.

IAD --- short-circuit current calculated by adiabatic method (effective value during the entire short-circuit period), A.

ISC --- known maximum short-circuit fault current (effective value during the entire short-circuit period), A.

K --- The number related to the carrier material, $As^{1/2}/mm^2$.

M --- thermal contact factor, $s^{-1/2}$.

S --- geometric cross-sectional area of the carrier fluid, mm^2 .

X --- Conductor and wire shielding (with gap) constant in the simplified calculation formula, $(mm^2/s)^{1/2}$.

Y --- Conductor and wire shielding (with gap) constant in the simplified calculation formula, mm^2/s .