ICS 29.060.10
CCS K 11

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 36551-2018

Calculation methods for properties of concentric lay overhead electrical stranded conductors

Issued on: July 13, 2018 **Implemented on: February 1, 2019**

Issued by: State Administration for Market Regulation, China National Standardization Administration

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard uses the redrafting method to modify the use of IEC TR61597..1995 "overall wire bare strand calculation method".

This standard has been structurally adjusted compared to IEC TR61597.1995. Appendix A lists this standard and IEC TR61597.

A summary of the numbering of chapters in.1995.

There are technical differences between this standard and IEC TR61597.1995, and the terms involved in these differences have been passed on the outer side of the page.

The vertical single line (|) in the blank position is marked, and Appendix B gives a list of the corresponding technical differences and their causes.

This standard has made the following editorial changes.

--- In line with the existing standard system, the standard name is changed to "the calculation method of concentric stranded overhead conductor performance";

--- In accordance with the requirements of GB/T 1.1-2009, the scope of the chapter added "this standard applies to GB/T 1179-2017 and

NB/T 42060-2015 related performance calculations for overhead conductors".

This standard was proposed by the China Electrical Equipment Industry Association.

This standard is under the jurisdiction of the National Bare Wire Standardization Technical Committee (SAC/TC422).

This standard was drafted by Shanghai Cable Research Institute Co., Ltd., Shanghai Zhongtian Aluminum Wire Co., Ltd., Jiangsu Hengtong Power Special Wire Co., Ltd.

Company, Guangdong Yuanguang Cable Industry Co., Ltd., Jiangsu Tongguang Power Transmission Line Technology Co., Ltd., Far East Cable Co., Ltd., Shandong Huaneng Line

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Division, Shanghai Electric Power College, Shanghai National Cable Testing Center Co., Ltd. participated in the drafting.

1 Scope

This standard gives the performance of the overhead conductors and their calculation methods in GB/T 1179-2017 and NB/T 42060-2015.

include.

---Wire current carrying capacity. calculation method and typical example;

---AC resistance, inductive reactance and capacitive reactance;

---Wire elongation. heat and stress-strain data;

---Wire creep;

--- Loss of strength of the aluminum wire due to high temperature;

--- Calculate the maximum length of the wire into a disk.

This standard does not cover all methods and theories for calculating wire performance, but gives a simple method with a certain degree of accuracy.

This standard applies to the calculation of the relevant performance of overhead conductors involved in GB/T 1179-2017 and NB/T 42060-2015.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 1179-2017 round wire concentric stranded overhead conductor (IEC 61089..1991, MOD)

Galvanized steel wire for GB/T 3428 overhead stranded wire (GB/T 3428-2012, IEC 60888.1987, MOD)

GB/T 17048-2017 Hard aluminum wire for overhead stranding (IEC 60889.1987, MOD)

GB/T 17937-2009 Aluminum-clad steel wire for electricians (IEC 61232.1993, MOD)

GB/T 23308-2009 Aluminum-magnesium-silicon alloy round wire for overhead stranding (IEC 60104.1987, IDT)

GB 50545-2010 110kV~750kV overhead transmission line design specification

NB/T 42060-2015 steel core heat-resistant aluminum alloy overhead wire

IEC 61089.1991 round wire concentric stranded overhead conductor (Roundwireconcentriclayoverheadelectricalstandard

Conductors)

3.1 Symbols and units

The following symbols apply to this document.

A wire cross-sectional area in square millimeters (mm2)

AL aluminum wire cross-sectional area

AG steel wire cross-sectional area

B Width of the inner wall of the reel, in meters (m)

D wire diameter in meters (m)

D1, d2 reel side plate diameter and core diameter in meters (m)

E wire overall elastic modulus in megapascals (MPa)

EL aluminum wire elastic modulus

EG steel wire elastic modulus

f frequency in Hertz (Hz)

F wire rated tensile force in Newtons (N)

The pull of the FL aluminum wire in Newton (N)

The tensile force of the FLH aluminum alloy wire part in Newton (N)

Tension of the FG steel wire part

I wire current in amperes (A)

Relative stiffness of K1 steel wire to aluminum wire

Kc creep coefficient

Ke relative blackbody emission coefficient

Kg stratum coefficient

Kp wire forming factor

KS wire and shield gap factor

L wire maximum loading length in meters (m)

Nu Nusselt number

Pconv convection heat dissipation in watts per meter (W/m)

Pj power loss in watts per meter (W/m)

Prad radiates heat in watts per meter (W/m)

Psol sunshine heat absorption in watts per meter (W/m)

r wire radius in meters (m)

Re Reynolds number

Wire resistance at RT temperature T in ohms per meter (ohm/m)

s Steven Bozeman constant (5.67x10-8W.m-2.K-4)