

Concentric lay stranded overhead electrical conductors containing one or more gap(s)

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National foreword

This British Standard is the UK implementation of EN 62420:2008. It is identical to IEC 62420:2008.

The UK participation in its preparation was entrusted to Technical Committee GEL/7, Overhead electrical conductors.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Date	Comments

**Concentric lay stranded overhead electrical conductors
containing one or more gap(s)
(IEC 62420:2008)**

Conducteurs pour lignes électriques
aériennes câblés en couches
concentriques comprenant
un ou plusieurs intervalle(s)
(CEI 62420:2008)

Leiter für Freileitungen aus
konzentrisch verseilten runden Drähten
mit einem oder mehreren
Zwischenraum/räumen
(IEC 62420:2008)

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

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The following dates were fixed:

- | | | |
|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2009-03-01 |
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Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62420:2008 was approved by CENELEC as a European Standard without any modification.

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CONCENTRIC LAY STRANDED OVERHEAD ELECTRICAL CONDUCTORS CONTAINING ONE OR MORE GAP(S)

1 Scope

This International Standard specifies the electrical and mechanical characteristics of concentric lay stranded overhead electrical conductors, containing one or more self-supporting aluminium or aluminium alloy layer(s) as depicted in Figure 1, made of combinations of any of the following metal wires:

- a) hard-drawn aluminium as per IEC 60889, designated A1;
- b) aluminium alloy type A or B as per IEC 60104, designated A2 or A3;
- c) thermal resistant aluminium alloy type as per IEC 62004, designated AT1, AT2, AT3 or AT4;
- d) regular strength steel as per IEC 60888, designated S1A or S1B;
- e) high strength steel as per IEC 60888, designated S2A or S2B;
- f) extra-high strength steel as per IEC 60888, designated S3A;
- g) aluminium-clad steel as per IEC 61232, designated 20SA, 27SA, 30SA or 40SA.

NOTE This standard covers the construction of self-damping conductors, as well as gap-type conductors. Although both types of conductors share a common design feature and the presence of one or more gaps between layers, they are intended for different purposes. Self-damping conductors (SDC) may have more than one gap to provide increased self-damping, whereas gap-type conductors are so designed as to allow the aluminium layers to slide freely over the core during installation, and therefore usually do not require more than one gap.

The various metal combinations permitted by this standard shall be in accordance with Table 1.

2 Normative references

The following referenced documents are indispensable for the application 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 60104:1987, *Aluminium-magnesium-silicon alloy wire for overhead line conductors*

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

IEC 60889:1987, *Hard-drawn aluminium wire for overhead line conductors*

IEC 61232:1993, *Aluminium-clad steel wires for electrical purposes*

IEC 61395:1998, *Creep test procedures for stranded conductors*

IEC 62004:2007, *Thermal resistant aluminium alloy wire for overhead line conductors*

3 Terms and definitions

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

3.1

aluminium

all types of aluminium and aluminium alloys listed in Clause 1

3.2

annular gap

constant space, void of any material except for air or grease, between two layers of a conductor

3.3**canting**

phenomena by which a formed wire is twisted relative to its own axis, thus producing a protuberance outside the layer

3.4**conductor**

material intended to be used for carrying electric current consisting of a plurality of uninsulated wires twisted together

3.5**concentric lay stranded conductor**

conductor composed of a central core surrounded by one or more adjacent layers of wires being laid helically in opposite directions.

3.6**direction of lay**

direction of twist of a layer of wires as it moves away from the viewer, with a right-hand lay being a clockwise direction and a left-hand lay being an anti-clockwise direction

3.7**equivalent wire diameter**

the diameter of a round wire which would have the same cross-sectional area as a given formed wire

3.8**formed wire**

filament of drawn or rolled metal having a constant, non-circular cross-section

3.9**layer**

group of wires located at a constant radial distance from the centre of the conductor

3.10**lay length**

axial length of one complete turn of the helix formed by an individual wire in a stranded conductor

3.11**lay ratio**

ratio of the lay length to the external diameter of the corresponding layer of wires in the stranded conductor

3.12**lot**

group of conductors manufactured by the same manufacturer under similar conditions of production

NOTE A lot may consist of part or all of the purchased quantity.

3.13**nominal**

name or identifying value of a measurable property by which a conductor or component of a conductor is identified and to which tolerances are applied

NOTE Nominal values should be target values.

3.14**rated tensile strength**

calculated maximum tensile load value at which a conductor may be subjected before one or more of its constituent wires break

3.15**round wire**

filament of drawn metal having a constant circular cross-section

3.16

self-supporting layer

layer made of formed wires which are designed in such a way as to not rely on the underlying layer for support

4 Designation system

A designation system is used to identify stranded conductors containing one or more gap(s). Conductors are designated AxGy/Syz or AxGy/SA where Ax identifies external wires (or the envelope), Gy denotes the presence and the number of annular gap(s) between two or more layers, and Syz and SA identify the steel core. In the designation of zinc coated wires, y represents the type of steel (regular, high or extra high strength) and z represents the class of zinc coating (A or B).

Conductors are identified as follows:

- a code number giving the equivalent conductive section of A1 expressed in mm²;
- a code number giving the section of the core material in mm²;
- a designation identifying the type of wires constituting the conductor in accordance with the second paragraph of this clause. The first designation (Ax) applies to the envelope, the second designation (Gy) applies to the presence and number of annular gap(s), and the third designation (Syz or SA) applies to the core;
- a code number designating the outside diameter of the conductor.

Example: 400/66-A1G2/S1A-274: A conductor made of 400 mm² A1 and 66 mm² S1A (regular strength steel), containing two annular gaps, with a nominal outside diameter of 27,4 mm (274 x 0,1).

5 Requirements for stranded conductors

5.1 Material

Stranded conductors shall be made up of round and/or formed aluminium wires and of zinc-coated steel or aluminium-clad wires. Before stranding all wires shall have the properties as specified in the International Standards given in Clause 2.

5.2 Conductor sizes

A list of conductor sizes is given as guidance in Annex E. Conductors for existing or established designs of overhead lines as well as sizes and strandings not included in this standard may be designed and supplied as agreed upon by the manufacturer and purchaser and the relevant requirements of this standard shall apply.

5.3 Surface

The surface of the conductor shall be free from all imperfections visible to the unaided eye (normal corrective lenses accepted), such as nicks, indentations, etc., not consistent with good commercial practice.

5.4 Stranding

5.4.1 General

All wires of the conductor shall be concentrically stranded. Before stranding, aluminium and core wires shall have approximately uniform temperature.

Adjacent wire layers shall be stranded with reverse lay directions. The direction of lay of the external layer shall be right-hand except when specifically indicated in the purchase order.

5.4.2 Lay ratio for core wires

The lay ratios for the zinc-coated (galvanised) steel or aluminium-clad wire layers shall be as follows:

- the lay ratio for the six-wire layer of the core shall be not less than 16 nor more than 26;