BS 7870-5:2011

*Incorporating Corrigendum No. 1*

BSI Standards Publication

# LV and MV polymeric insulated cables for use by distribution and generation utilities

## Part 5: Polymeric insulated aerial bundled conductors (ABC) of rated voltage 0.6/1 kV for overhead distribution

(Implementation of HD 626)

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## Publishing and copyright information



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# Foreword

## Publishing information

This part of BS 7870 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 December 2011. It was prepared by Subcommittee GEL/20/16, *Medium/High voltage cables*, under the authority of Technical Committee GEL/20, *Electric cables*. A list of organizations represented on these committees can be obtained on request to their secretary.

## Supersession

This part of BS 7870 supersedes BS 7870-5:1999, which is withdrawn.

## Relationship with other publications

BS 7870 implements the nationally applicable parts of Harmonization Documents HD 603, 605, 620, 626 and 627 published by the European Committee for Electrotechnical Standardization (CENELEC) in accordance with the decision of the CENELEC Technical Board.

BS 7870 applies to cables for fixed installations having a rated voltage $U_0/U$ up to and including 19/33 kV, and is published as a series of separate parts and sections, as listed in the table in the foreword to BS 7870-1.

BS 7870-5 implements HD 626 S1 Part 4M, and is to be read in conjunction with BS 7870-1 and BS 7870-2.

## Information about this document

This is a full revision of the standard and brings the standard up to date in accordance with current practice in the industry.

The start and finish of text introduced or altered by Corrigendum No. 1 is indicated in the text by tags ⟦C1⟩ and ⟨C1⟧.

A general guide to use for the types of cable specified in BS 7870 is given in BS 7870-1, Annex A.

## Hazard warnings

**WARNING.** This British Standard calls for the use of substances and/or procedures that can be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

## Use of this document

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

## Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

*Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.*

## Contractual and legal considerations

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

**Compliance with a British Standard cannot confer immunity from legal obligations.**

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# 1 Scope

This part of BS 7870 specifies requirements for the construction, dimensions and mechanical and electrical properties of polymeric insulated aerial bundled conductors (ABCs) of rated voltage 0.6/1(1.2) kV, designed for a maximum continuous conductor operating temperature of 75 °C.

This part of BS 7870 specifies requirements for ABCs with the following:

- two, four or five-core construction;
- phase and neutral conductors of equal size and type;
- conductor sizes from 25 $mm^2$ up to and including 120 $mm^2$;
- optional, insulated control or street lighting cores (see Annex A).

*NOTE 1 The fifth core in the five-core bundle is designated as a protective conductor (protective core), i.e. a conductor used for some measure of protection against electric shock.*

*NOTE 2 Guidance on type approval is given in Annex B.*

# 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.

BS 2627, *Specification for wrought aluminium for electrical purposes – Wire*

BS 7870-1, *LV and MV polymeric insulated cables for use by distribution and generation utilities – Part 1: General*

BS 7870-2, *LV and MV polymeric insulated cables for use by distribution and generation utilities – Part 2: Methods of test*

BS EN 50182:2001, *Conductors for overhead lines – Round wire concentric lay stranded conductors*

BS EN 60228, *Conductors of insulated cables*

BS EN 60811-1-1, *Insulating and sheathing materials of electric and optical cables – Common test methods – Part 1-1: General application Measurement of thickness and overall dimensions – Tests for determining the mechanical properties*

BS EN 60811-1-2, *Common test methods for insulating and sheathing materials of electric and optical cables – Part 1-2: General application – Thermal ageing methods*

BS EN 60811-1-3, *Insulating and sheathing materials of electric and optical cables – Common test methods – Part 1-3: General application – Methods for determining the density – Water absorption tests – Shrinkage test*

BS EN 60811-2-1, *Insulating and sheathing materials of electric and optical cables – Common test methods – Part 2-1: Methods specific to elastomeric compounds – Ozone resistance, hot set and mineral oil immersion tests*

BS EN 60811-3-1, *Insulating and sheathing materials of electric cables – Common test methods – Part 3: Methods specific to PVC compounds – Section 3-1: Pressure test at high temperature – Tests for resistance to cracking*

BS EN 60811-4-1, *Insulating and sheathing materials of electric and optical cables – Common test methods – Part 4-1: Methods specific to polyethylene and polypropylene compounds – Resistance to environmental stress cracking – Measurement of the melt flow index – Carbon black and/or mineral filler content measurement in polyethylene by direct combustion – Measurement of carbon black content by thermogravimetric analysis (TGA) – Assessment of carbon black dispersion in polyethylene using a microscope*

BS EN ISO 6892-1, *Metallic materials – Tensile testing – Part 1: Method of test at ambient temperature*

IEC 60885-1, *Electrical test methods for electric cables – Part 1: Electrical tests for cables, cords and wires for voltages up to and including 450/750 V*

PD 2379, *Register of colours of manufacturers' identification threads for electric cables and cords*

# 3 Voltage designation

ABCs shall be designated by the voltages $U_0$, $U$ and $U_m$, expressed in the form $U_0/U$ ($U_m$). The voltage designation of the ABCs specified in this standard shall be 0.6/1(1.2) kV.

# 4 Conductors

Except for the conductors of bare protective cores, the conductors shall be of compacted, circular, stranded aluminium in accordance with BS EN 60228. The individual wires used in the construction shall be material 1350 in the H9 condition as specified in BS 2627. The individual wires shall be of the same nominal diameter before stranding into a compacted circular formation.

Successive layers of wire shall have opposite directions of lay, the outermost layer being right-handed. The conductors shall conform to the requirements specified in Table 1.

For a five-core bundle, if agreed between the manufacturer and the purchaser, it shall be permissible for a bare protective core to be provided. The conductors of bare protective cores shall be of Type 60-AL3, as specified in BS EN 50182:2001 and shall conform to the requirements specified in BS EN 50182:2001.

For two-core bundles, the conductor sizes shall be from 25 mm$^2$ up to and including 95 mm$^2$. For five-core bundles, the phase and neutral cores shall be 50 mm$^2$, 70 mm$^2$ or 95 mm$^2$ and shall conform to the requirements of Table 1. The protective core shall be at least 25 mm$^2$ and, if insulated, shall also conform to the requirements of Table 1.

# 5 Insulation

Except for the conductors of bare protective cores, all conductors shall be insulated with extruded cross-linked polyethylene. The insulation shall be coloured black.

The insulation thickness and core diameter shall conform to the requirements specified in Table 1.

Table 1 **Requirements for two, four and five-core bundles**

| Parameter | Nominal cross-sectional area of conductors mm$^2$ | | | | | |
|---|---|---|---|---|---|---|
| | **25** | **35** | **50** | **70** | **95** | **120** |
| Nominal number of wires in conductor | 7 | 7 | 19 [A)] | 19 [A)] | 19 [A)] | 19 [A)] |
| Diameter of conductor: | | | | | | |
| – minimum (mm) | 5.6 | 6.6 | 7.7 | 9.3 | 11.0 | 12.5 |
| – maximum (mm) | 6.5 | 7.5 | 8.5 | 10.2 | 12.0 | 13.5 |
| Minimum average thickness of insulation (mm) | 1.3 | 1.3 | 1.5 | 1.5 | 1.7 | 1.7 |
| Minimum thickness of insulation at any point (mm) | 1.07 | 1.07 | 1.25 | 1.25 | 1.43 | 1.43 |
| Maximum thickness of insulation: | | | | | | |
| – phase core excluding ribs (mm) | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 |
| – neutral core including ribs (mm) | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 |
| Maximum diameter of core: | | | | | | |
| – phase core excluding ribs (mm) | 9.7 | 10.7 | 12.1 | 13.8 | 16.1 | 17.6 |
| – neutral core including ribs (mm) | 10.2 | 11.2 | 12.6 | 14.3 | 16.6 | 18.1 |
| Neutral core identification: | | | | | | |
| – number of ribs | 12 | 12 | 12 | 16 | 16 | 16 |
| Maximum d.c. resistance of conductor in bundle at 20 °C (Ω/km) | 1.200 | 0.868 | 0.641 | 0.443 | 0.320 | 0.253 |
| Minimum tensile strength of conductor (kN) [B)] | 4.1 | 5.6 | 7.6 | 11.0 | 15.3 | 19.4 |

[A)] Subject to a tolerance of ±one wire.
[B)] Calculated value based on a tensile strength of 170 N/mm$^2$.

# 6 Identification of cores

## 6.1 Phase cores

The individual phase cores of a four-core bundle shall be identified by one, two and three continuous longitudinal ribs, respectively. In the case of two-core bundles, the phase core shall be identified by one rib. The ribs shall have a base width of (1 ±0.2) mm and a separation distance of 1 mm to 2 mm. The total proportion of a core's circumference taken up by the ribs shall not exceed 20% measured from rib centre to rib centre, and the rib separation shall be the same for all cores in the ABC to within ±0.2 mm. The minimum rib height shall be 0.5 mm.

## 6.2 Neutral cores

The surface of the neutral core shall be lightly ribbed continuously along its length with a minimum of 12 ribs for cores up to and including 50 mm$^2$ and a minimum of 16 ribs for cores above 50 mm$^2$. Each rib shall have a minimum height of 0.25 mm and a base width of (0.5 ±0.1) mm. Ribs shall be evenly spaced around the circumference of the core. An intermittent absence of up to 25% of the specified number of ribs at any point shall be permissible.

## 6.3 Insulated protective cores

The insulation of insulated protective cores shall be smooth.

# 7 Laying up

The insulated cores shall be laid up [C1] with a left-hand direction of lay and in the sequence shown in Figure 1. [C1]

Protective, control and street lighting cores shall be laid in the outer interstices of the phase and neutral cores (see Annex A).

The length of lay of the cores shall be as given in Table 2.

Figure 1 **Laying up sequence of four-core bundles**

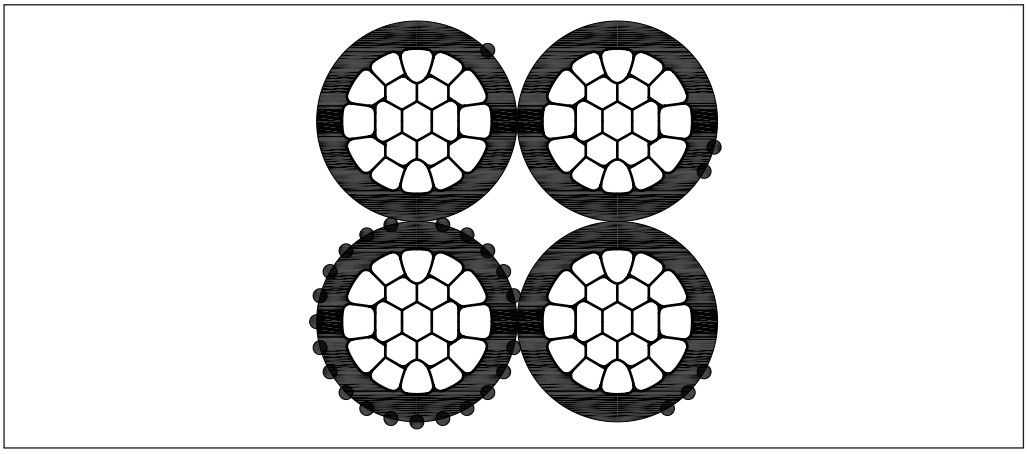


Table 2 **Lay lengths**

| **Nominal cross-sectional area of conductor** mm² | **Lay length** mm | | | | | |
|---|---|---|---|---|---|---|
| | **Two-core** | | **Four-core** | | **Five-core** | |
| | **Min.** | **Max.** | **Min.** | **Max.** | **Min.** | **Max.** |
| 25 | 438 | 557 | 523 | 666 | — | — |
| 35 | 482 | 613 | 576 | 734 | — | — |
| 50 | 543 | 692 | 651 | 829 | 766 | 974 |
| 70 | 618 | 787 | 741 | 944 | 860 | 1 095 |
| 95 | 719 | 916 | 865 | 1 100 | 920 | 1 170 |
| 120 | — | — | 944 | 1 201 | — | — |

# 8 Manufacturer's identification

The identification of the manufacturer shall be either by a coloured thread or a name tape applied beneath the insulation of at least one core. Where the identification is by means of a coloured thread, the colour shall be in accordance with PD 2379.

# 9 Testing

Testing shall be performed in accordance with the schedule of tests given in Table 3.

Table 3 **Schedule of tests**

| Test | Test method and requirements given in clause |
|---|---|
| ***Routine tests*** | |
| Conductor resistance | **10.1** |
| Spark test: | |
| i) on insulated cores | **10.2.1** |
| ii) on complete bundle | **10.2.2** |
| Voltage test on complete bundle | **10.3** |
| Identification: | |
| i) of cores | **10.4** |
| ii) of manufacturer | **10.5** |
| ***Sample tests*** | |
| Tensile test | **11.1** |
| Conductor construction | **11.2** |
| Insulation: | |
| a) thickness | **11.3** |
| b) core outside diameter | **11.4** |
| c) rib geometry and spacing | **11.5** |
| d) hot set test | **11.6** |
| Laying up | **11.7** |
| Slippage test | **11.8** |
| ***Type tests*** | |
| A.C. voltage test | **12.1.2** |
| Insulation resistance | **12.1.3** |
| Insulation material tests | **12.2** |
| Tensile tests on conductor | **12.3** |

# 10 Routine tests

## 10.1 Conductor resistance test

The d.c. resistance of each conductor shall be measured in accordance with of BS 7870-2, **3.1.1** and the results, when corrected to 20 °C, shall conform to the values specified in Table 1.

## 10.2 Spark test

### 10.2.1 Spark test on individual insulated cores

Spark testing shall be performed on each individual insulated core, after the application of the insulation, in accordance with BS 7870-2, **3.6.1** at the following voltage:

- for conductor sizes up to and including 35 $mm^2$ 15 kV a.c. or 22.5 kV d.c.;
- for conductors sizes above 35 $mm^2$ 20 kV a.c. or 30 kV d.c.

No breakdown shall occur.

### 10.2.2 Spark test on complete bundle

After laying up into the complete bundle, for ABCs with fully insulated cores only, the ABC shall be spark tested in accordance with BS 7870-2, **3.6.1** at 10 kV a.c. or 15 kV d.c. No breakdown shall occur.

For ABCs with a bare protective core, the test as specified in **10.3** shall be applied.

## 10.3 Voltage test on complete bundle

For ABCs with a bare protective core, the complete ABC shall be tested accordance with BS 7870-2, **3.2.1**. A test voltage of 3.5 kV r.m.s shall be applied for 5 min. No breakdown of the insulation shall occur.

## 10.4 Identification of cores

The number of ribs on the phase and neutral cores shall be checked by visual examination and shall conform to the requirements given in Clause **6**.

## 10.5 Identification of manufacturer

The identification of the manufacturer shall be checked by visual examination and shall conform to the requirements given in Clause **8**.

# 11 Sample tests

## 11.1 Tensile test

The tensile strength of three wires shall be measured in accordance with BS EN ISO 6892-1 before stranding, and the mean value shall be recorded. The tensile strength of the completed conductor shall then be calculated by multiplying the mean value by the number of wires in the conductor and by a stranding factor 0.95.

The calculated value shall be not less than the value specified in Table 1.

## 11.2 Conductor construction

The number of wires and the direction of lay of the wires shall be checked by visual examination and shall conform to the requirements specified in Clause **4** and Table 1.

The diameter of the conductor shall be checked by taking two measurements at right angles to each other. The average of the two measurements shall conform to the minimum/maximum diameter requirements specified in Table 1.

## 11.3 Insulation thickness

The insulation thickness of all cores shall be measured in accordance with BS EN 60811-1-1. Except where thicknesses including ribs are specified in Table 1, measurements shall not be taken at the ribs.

The average of the measurements shall be not less than the value for the minimum average thickness specified in Table 1. The minimum thickness at any point shall be not less than the value specified in Table 1. The maximum thickness of the insulation shall not exceed the maximum value specified in Table 1.

## 11.4 Measurement of core outside diameter

The diameter of all cores shall be measured in accordance with BS EN 60811-1-1. Except where core diameters including ribs are specified in Table 1, measurements shall not be taken at the ribs.

The average of two measurements taken at right angles to each other shall not exceed the maximum diameter of the core specified in Table 1.

## 11.5 Rib geometry and spacing

The rib height and rib width of each insulated core shall be measured in accordance with BS EN 60811-1-1.

The height and width of each rib shall conform to the values specified in Clause **6**.

The rib spacing on all phase cores shall be measured along with the total circumferential length from the first to last rib on cores with 2 and 3 ribs. The percentage total coverage shall be calculated from the measured coverage and the circumference calculated from the measured diameter.

The rib spacing and coverage shall conform to the values specified in Clause **6**.

## 11.6 Hot set test on insulation

A sample of insulation taken from one core shall be tested for hot set in accordance with BS EN 60811-2-1, Clause **9**, and shall conform to the requirements specified in Table 5.

## 11.7 Laying up

The direction of lay and the sequence of cores shall be checked by visual examination and shall conform to the requirements specified in Clause **7**.

The lay length of the cores shall be measured and shall conform to the requirements specified in Table 2.

## 11.8 Slippage test

When the phase and neutral cores of the ABC are tested in accordance with Annex C, the mean value of the slippage load shall be not less than the value specified in Table 4 for the appropriate nominal conductor size.

Table 4 **Minimum slippage loads for ABCs**

| **Nominal cross-sectional area of conductors** mm$^2$ | **Minimum slippage load** kN |
|---|---|
| 25 | 2.70 |
| 35 | 2.90 |
| 50 | 3.30 |
| 70 | 4.05 |
| 95 | 4.75 |
| 120 | 4.75 |

# 12 Type tests

## 12.1 Electrical tests

### 12.1.1 General

The tests specified in **12.1.2** and **12.1.3** shall be performed on a section of ABC between 10 m and 15 m in length. They shall be performed on each individual core of the ABC.

### 12.1.2 A.C. voltage test

Immerse the sample length of ABC in a water bath at (20 ±5) °C for at least 1 h before commencing the test. Subject the ABC to a voltage of 2 kV a.c. between the conductors and the water. The test sample shall withstand the test voltage for 4 h without failure.

### 12.1.3 Insulation resistance

Perform the test in accordance with IEC 60885-1 on the sample length used for the voltage test specified in **12.1.2**. The water temperature shall be (75 ±2) °C. The period of immersing the sample before the test shall be not less than 1 h. Calculate the volume resistivity, $\rho$, in ohm centimetres, from the measured resistance by the following formula:

$$\rho = \frac{2 \times \pi L R}{\log_e D/d}$$

where:

*R* is the measured insulation resistance, in ohms (Ω);

*L* is the length of the ABC sample, in centimetres (cm);

*D* is the outer diameter of the insulation (neglecting ribs for phase cores), in millimetres (mm);

*d* is the conductor diameter, in millimetres (mm).

The values calculated from the measurement shall be not less than $1 \times 10^{12}$ Ω·cm at 75 °C.

## 12.2 Insulation material tests

Samples of the insulation taken from the finished bundle or samples of the core, as appropriate, shall be subjected to all the tests specified in Table 5, with the exception of the hot set test. The samples shall conform to the requirements specified in Table 5.

Table 5 **Requirements for insulation material**

| Test | Test method | Requirements |
|---|---|---|
| **Properties in the state as delivered** | BS EN 60811-1-1, Clause **9** | |
| Minimum tensile strength | | 12.5 N/mm$^2$ |
| Minimum elongation at break | | 200% |
| **Properties after ageing in air oven** | BS EN 60811-1-2, Clause **8** | |
| Temperature | | (135 ±2) °C |
| Duration | | 168 h |
| Maximum variation of tensile strength [A)] | | 25% |
| Maximum variation of elongation at break [A)] | | 25% |
| **Water absorption – gravimetric method** | BS EN 60811-1-3, Clause **9** | |
| Temperature | | (85 ±2) °C |
| Duration | | 336 h |
| Maximum increase in mass | | 1 mg/cm$^2$ |
| **Shrinkage test** | BS EN 60811-1-3, Clause **10** | |
| Distance between marks "*L*" | | 200 mm |
| Temperature | | 130 °C |
| Duration | | 1 h |
| Maximum shrinkage | | 4% |
| **Hot set test** | BS EN 60811-2-1, Clause **9** | |
| Temperature | | 200 °C |
| Duration | | 15 min |
| Mechanical stress | | 0.2 N/mm$^2$ |
| Maximum elongation under load | | 175% |
| Maximum elongation after unloading | | 15% |
| **Pressure test at high temperature** | BS EN 60811-3-1, Clause **8** | |
| Temperature | | 80 °C |
| Duration | | BS EN 60811-3-1, **8.1.5** |
| Maximum depth of indentation | | 50% |
| **Carbon black** | BS EN 60811-4-1, Clause **11** | |
| Minimum content | | 2.0% |

[A)] Variation is the difference between the median value after ageing and the median value without ageing, expressed as a percentage of the latter.

### 12.3 Tensile test on conductor

Subject a sample core of the bundle to a tensile test using a method approved by the purchaser.

The sample shall meet the requirements for the ultimate tensile strength specified in Table 1.

## 13 Additional control or street lighting cores

If additional control or street lighting cores are required they shall conform to Clause **4** to Clause **12**, inclusive, and also to the additional provisions specified in Annex A.

# 14 Sealing and drumming

Before despatch, the ends of the bundled conductors shall be sealed to prevent moisture ingress during transportation and storage.

*NOTE The possibility of damage to the moisture seals during handling and installation of the bundle should be borne in mind. Where such damage might have occurred, the seals should be inspected and remade if necessary.*

Both ends of every length of the assembled bundle shall be temporarily bound in such a manner as to prevent the cores from separating.

Drums shall be suitable to take a round spindle and shall be lagged, where required, to protect the bundle from damage. The end projecting from the drum shall be protected. Each drum shall bear a distinguishing number. The following particulars of the bundle shall be shown on one flange of the drum:

- number of this British Standard i.e. BS 7870-5 [1)]
- ABC;
- number and size of conductors;
- voltage;
- length;
- gross mass;
- direction of rolling.

[1)] Marking BS 7870-5 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is solely the claimant's responsibility. Such a declaration is not to be confused with third-party certification of conformity.

# Annex A (normative) Additional requirements for insulated control or street lighting cores

Additional cores that may be required for control or street lighting purposes shall conform to the following additional requirements.

- They shall be installed only in four or five-core bundles of 50 $mm^2$ nominal cross-sectional area or above.
- They shall be installed only in the outer interstices of such bundles.
- They shall not exceed two in number in any one bundle.
- Each such core shall not exceed 25 $mm^2$ in nominal cross-sectional area.

*NOTE The identification of such cores may be determined by agreement between the manufacturer and the purchaser.*

# Annex B (informative) Guidance on type approval

## B.1 General

Type approval for part or the whole of the range of ABCs specified in this British Standard should be obtained by following the procedure described in this annex. If subsequent modifications are made to the materials or method of manufacture which might affect any or all the performance data previously obtained, the relevant type approval tests, as agreed between the purchaser and the manufacturer, should be repeated.

## B.2 Scope of approval

Type approval for the range of ABCs given in this specification should be given only on the basis of tests on four-core bundles. However, type approval of four-core bundles should be deemed to apply to five-core and two-core bundles of equivalent size.

## B.3 Limited approval of any one conductor size

Limited approval should be obtained by successfully completing all routine, sample and type tests appropriate to a particular conductor size.

## B.4 Approval of a range of conductor sizes

Approval for a range of conductor sizes should be obtained by successful completion of all the routine, sample and type tests on the largest and smallest of conductors of the range for which approval is sought.

# Annex C (normative) Slippage test

## C.1 Apparatus

**C.1.1** *Clamping block*, with the dimensions shown in Figure C.1, with removable threaded inserts having 1.26 threads/mm, a depth of thread of 0.51 mm and a thread core diameter as specified in Table C.1.

**C.1.2** *Tensile testing machine*, in which it is possible to apply a load between the conductor of the test sample and the clamping block.

Figure C.1 **Clamping block for slippage test**

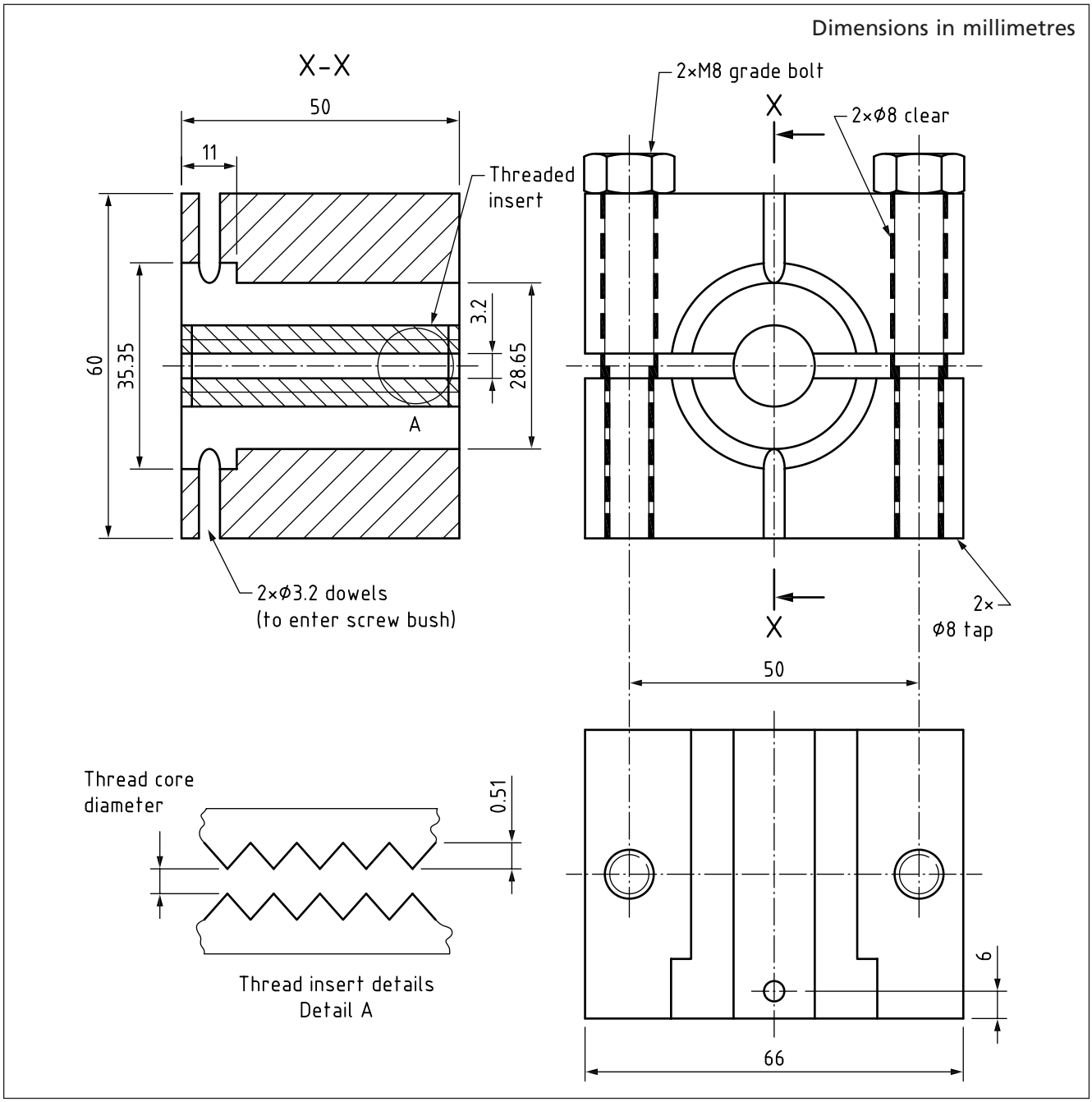


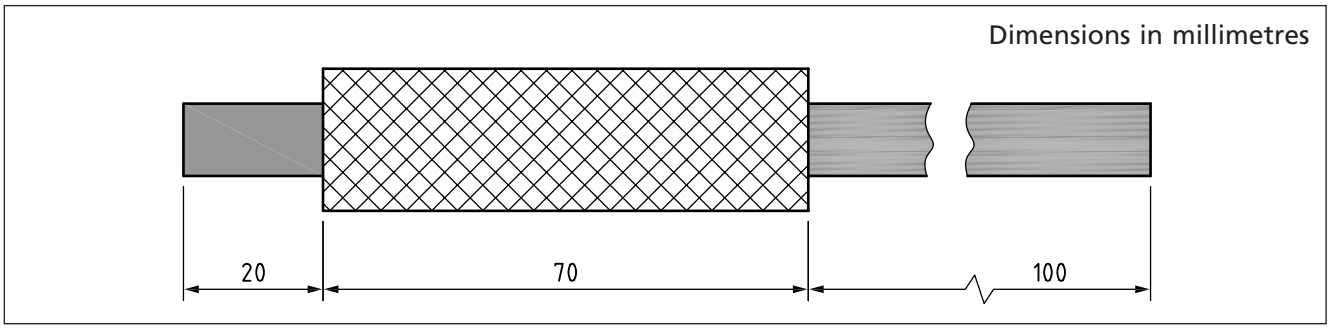
Table C.1 **Thread core diameter of threaded insert**

| Nominal cross-sectional area of conductors | Thread core diameter |
|---|---|
| $mm^2$ | mm |
| 25 | 9.1 |
| 35 | 10.1 |
| 50 | 11.5 |
| 70 | 13.2 |
| 95 | 15.4 |
| 120 | 16.9 |

## C.2 Preparation of test samples

Three samples from each core of the cable shall be prepared in accordance with Figure C.2. The ribs shall be removed from the insulation.

Figure C.2 **Sample dimensions for slippage test**




## C.3 Procedure

Fit the mounting block, with the appropriate threaded insert, over the insulation of one of the test samples and tighten the two bolts to a torque of (10.0 ±0.1) N·m.

Mount the test sample and the clamping block in the tensile testing machine such that a load can be applied between the bare conductor and the clamping block. Apply a load by setting the jaws of the tensile testing machine to separate at a rate of (10 ±2) mm/min. Record the load necessary to start the conductor sliding through the insulation.

Repeat the test on the remaining two samples and express the results as the mean of the three load values.

# Bibliography

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

HD 603 S1, *Distribution cables of rated voltage 0.6/1 kV*

HD 605 S2, *Electric cables – Additional test methods*

HD 620 S2, *Distribution cables with extruded insulation for rated voltages from 3.6/6 (7.2) kV up to and including 20.8/36 (42) kV*

HD 626 S1, *Overhead distribution cables of rated voltage $U_o/U$ ($U_m$): 0.6/1 (1.2) kV*

HD 627 S1, *Multicore and multipair cable for installation above and below ground*

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