

# INTERNATIONAL STANDARD

**IEC**  
**61156-5-2**

First edition  
2002-05

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## **Multicore and symmetrical pair/quad cables for digital communications –**

### **Part 5-2:**

**Symmetrical pair/quad cables with transmission  
characteristics up to 600 MHz –**

**Horizontal floor wiring – Capability approval –  
Sectional specification**

*Câbles multiconducteurs à paires symétriques et quartes  
pour transmissions numériques –*

### *Partie 5-2:*

*Câbles à paires symétriques et quartes avec caractéristiques  
de transmission allant jusqu'à 600 MHz –*

*Câble capillaire – Agrément de savoir-faire  
Spécification intermédiaire*



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## MULTICORE AND SYMMETRICAL PAIR/QUAD CABLES FOR DIGITAL COMMUNICATIONS –

### Part 5-2: Symmetrical pair/quad cables with transmission characteristics up to 600 MHz – Horizontal floor wiring – Capability Approval – Sectional specification

## FOREWORD

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International Standard IEC 61156-5-2 has been prepared by subcommittee 46C: Wires and symmetric cables, of IEC technical committee 46: Cables, wires, waveguides, RF connectors and accessories for communication and signalling.

The text of this standard is based on the following documents:

| FDIS         | Report on voting |
|--------------|------------------|
| 46C/506/FDIS | 46C/521/RVD      |

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2006. At this date, the publication will be

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- withdrawn;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

## MULTICORE AND SYMMETRICAL PAIR/QUAD CABLES FOR DIGITAL COMMUNICATIONS –

### Part 5-2: Symmetrical pair/quad cables with transmission characteristics up to 600 MHz – Horizontal floor wiring – Capability Approval – Sectional specification

## 1 General

### 1.1 Scope

This part of IEC 61156 applies to Capability Approval requirements for cables for digital communications in horizontal floor wiring in accordance with generic specification IEC 61156-1-1 and Clause 4 of the sectional specification IEC 61156-5.

Clause 2 refers to the content of the Capability Manual.

Clause 3 refers to the Quality Plans.

Clause 4 is related to the maintenance of the Capability Approval.

NOTE Quality assessment belongs to the negotiation between customers and manufacturers. The following clauses are intended to be a guide when there is a request for a third-party Capability Approval. However, it may also be used as the basis for second-party or self-certification.

### 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 61156-1, *Multicore and symmetrical pair/quad cables for digital communications – Part 1: Generic specification*

IEC 61156-1-1, *Multicore and symmetrical pair/quad cables for digital communications – Part 1-1: Capability approval – Generic specification*

IEC 61156-5, *Multicore and symmetrical pair/quad cables for digital communications – Part 5: Symmetrical pair/quad cables with transmission characteristics up to 600 MHz – Horizontal floor wiring – Sectional specification*

## 2 Contents of the Capability Manual

### 2.1 Description of the cable families related to the capability domain

This subclause of the Capability Manual describes the family/families of cables for which Capability Approval is required as follows.

- a) Reference to the applicable standards (e.g. sectional specification, detail specifications, etc.).
- b) Description of the cable constructional details, for example size of conductors, insulation material and insulation dimensions, type of cable element, i.e. pairs or quads, screening material and dimensions, screen construction, sheath material and dimensions, outer diameter, maximum cable size and maximum cable length.
- c) Additional characteristics or requirements not covered by the applicable standard.

## **2.2 Identification of the manufacturing process, equipment utilization and manufacturing instructions**

For each family of cables the manufacturing processes shall be identified; for instance, by means of a flow chart as given in Annex A. For each manufacturing phase, it is required to specify:

- a) description of available machinery and corresponding working instructions;
- b) construction techniques;
- c) process boundaries related to each phase of manufacturing;
- d) test and inspection points in the manufacturing process.

An example of such manufacturing process step identification is given in Annex B.

## **2.3 Policy on rework and repair**

This subclause describes the permissible operations of rework and repair and their related operative instructions.

# **3 Quality Plan**

## **3.1 General**

Reference is made to 2.2.4 of IEC 61156-1-1 with regard to process control. As a minimum, the following items shall be identified and considered:

- a) identification of manufacturing stages;
- b) identification of those characteristics which depend upon process phases and related tests;
- c) identification of all testing procedures;
- d) acceptance limits and criteria for the process and manufacturing stages;
- e) sampling and sampling plan (type and frequency). An example of such a sampling plan is given in Annex C.

## **3.2 Selection of Capability Qualifying Components (CQCs)**

It is necessary to point out that the manufacture of cables is composed of many process phases that are continuous and not independent of each other. Hence, the products in each phase are not discrete production components.

For this reason, the CQCs are presented by representative samples taken from each phase or from the finished products.

NOTE It is recommended that the trend of the results and/or statistical quality indices related to the tests carried out be examined.

## **3.3 Purchased raw materials**

The Quality Plan shall include a list of the raw materials used for the manufacture of a cable family, their corresponding purchasing specifications, and procedures for incoming inspections.

## **3.4 Design criteria (if applicable)**

The Quality Plan shall include a list of the documentation concerning the design of the cable family either directly or by reference to the manufacturer's internal instructional documents.

The main items are

- a) the design of each product family;
- b) the material selection criteria;
- c) rules for the dimensioning of the cable elements.

#### **4 Maintenance of Capability Approval**

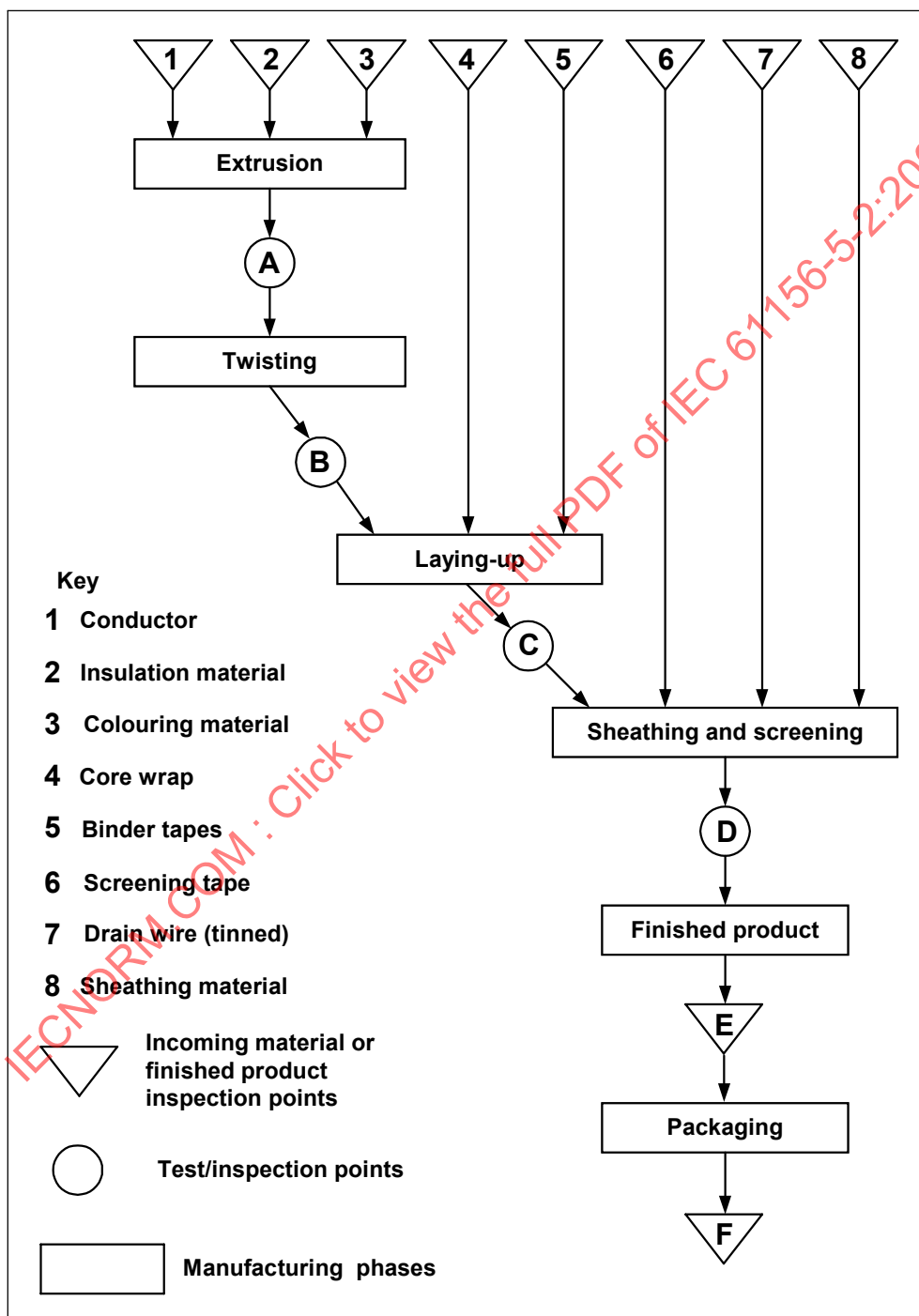
The maintenance of the Capability Approval shall be based on the examination of

- a) the documentation related to the process control carried out during the period considered;
- b) the test results on the finished products;
- c) the review of the manufacturing lines in accordance with the Capability Manual.

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## Annex A (informative)

### Manufacturing flow chart of the manufacturing process, equipment utilization and manufacturing instructions





## Annex B

(informative)

### Family: Symmetrical pair/quad cables for horizontal floor wiring with transmission characteristics up to 250 MHz – Example of identification of the manufacturing process and its boundaries

| Phase No. | Process     | Process line                                  | Working instruction       | Process boundaries   |
|-----------|-------------|---|---------------------------|--|
| 1         | Insulating  | Extruder<br><br>XXXXX<br><br>XXXX<br><br>XXXX | <br><br>XXXXX<br><br>XXXX | Copper solid conductor :<br>Min./Max. diameter<br><br>Insulation thickness and diameter<br>over the insulation<br><br>Type of insulation<br><br>Colour marking |
| 2         | Twisting    | Twisting lines<br><br>XXXXX<br><br>XXXX       | <br><br>XXXXX<br><br>XXXX | Pairs and/or quads<br><br>Minimum lay length<br>Maximum lay length   |
| 3         | Laying-up   | <br><br>XXXXX<br><br>XXXX                     | <br><br>XXXXX<br><br>XXXX | Pairs and/or quads<br><br>Minimum lay length<br>Maximum lay length   |
| 4         | Screening   | Taping line<br><br>XXXXX<br><br>XXXX          | <br><br>XXXXX<br><br>XXXX | Longitudinal minimum overlap/<br>Helical minimum overlap   |
| 5         | Sheathing   | Extruder<br><br>XXXXX<br><br>XXXX             | <br><br>XXXXX<br><br>XXXX | Type of material<br><br>Min./Max. outer diameter<br><br>Min./Max. thickness  |
| 6         | Final tests | Testing department                            |                           | Some tests may be performed<br>externally  |
| 7         | Packaging   | Delivery department                           |                           | Maximum cable length<br>Maximum reel dimensions  |