

INTERNATIONAL STANDARD

IEC
61156-6-2

First edition
2002-05

Multicore and symmetrical pair/quad cables for digital communications –

Part 6-2:

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

Work area wiring – Capability approval –

Sectional specification

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

Partie 6-2:

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

Raccordement de terminal – Agrément de savoir-faire –

Spécification intermédiaire



Reference number
IEC 61156-6-2:2002(E)

Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

Consolidated editions

The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

Further information on IEC publications

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology. Information relating to this publication, including its validity, is available in the IEC Catalogue of publications (see below) in addition to new editions, amendments and corrigenda. Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is also available from the following:

- **IEC Web Site** (www.iec.ch)

- **Catalogue of IEC publications**

The on-line catalogue on the IEC web site (www.iec.ch/catlg-e.htm) enables you to search by a variety of criteria including text searches, technical committees and date of publication. On-line information is also available on recently issued publications, withdrawn and replaced publications, as well as corrigenda.

- **IEC Just Published**

This summary of recently issued publications (www.iec.ch/JP.htm) is also available by email. Please contact the Customer Service Centre (see below) for further information.

- **Customer Service Centre**

If you have any questions regarding this publication or need further assistance, please contact the Customer Service Centre:

Email: custserv@iec.ch
Tel: +41 22 919 02 11
Fax: +41 22 919 03 00

INTERNATIONAL STANDARD

IEC
61156-6-2

First edition
2002-05

Multicore and symmetrical pair/quad cables for digital communications –

Part 6-2:

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

Work area wiring – Capability approval

Sectional specification

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

Partie 6-2:

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

Raccordement de terminal – Agrément de savoir-faire

Spécification intermédiaire

© IEC 2002 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE

H

For price, see current catalogue

INTERNATIONAL ELECTROTECHNICAL COMMISSION

MULTICORE AND SYMMETRICAL PAIR/QUAD CABLES FOR DIGITAL COMMUNICATIONS –

Part 6-2: Symmetrical pair/quad cables with transmission characteristics up to 600 MHz – Work area wiring – Capability Approval – Sectional specification

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61156-6-2 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/515/FDIS	46C/523/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 6-2: Symmetrical pair/quad cables with transmission characteristics up to 600 MHz – Work area wiring – Capability Approval – Sectional specification

1 General

1.1 Scope

This part of IEC 61156 applies to Capability Approval requirements for cables intended to construct patch, equipment, and work area cords for digital communications in accordance with generic specification IEC 61156-1-1 and Clause 4 of the sectional specification IEC 61156-6.

Clause 2 refers to the content of the Capability Manual.

Clause 3 refers to the related quality layout.

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 61156-6, *Multicore and symmetrical pair/quad cables for digital communications – Part 6: Symmetrical pair/quad cables with transmission characteristics up to 600 MHz – Work area 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.

- Reference to the applicable standards (e.g. sectional specification, detail specifications, etc.).
- 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.
- 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. At 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 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

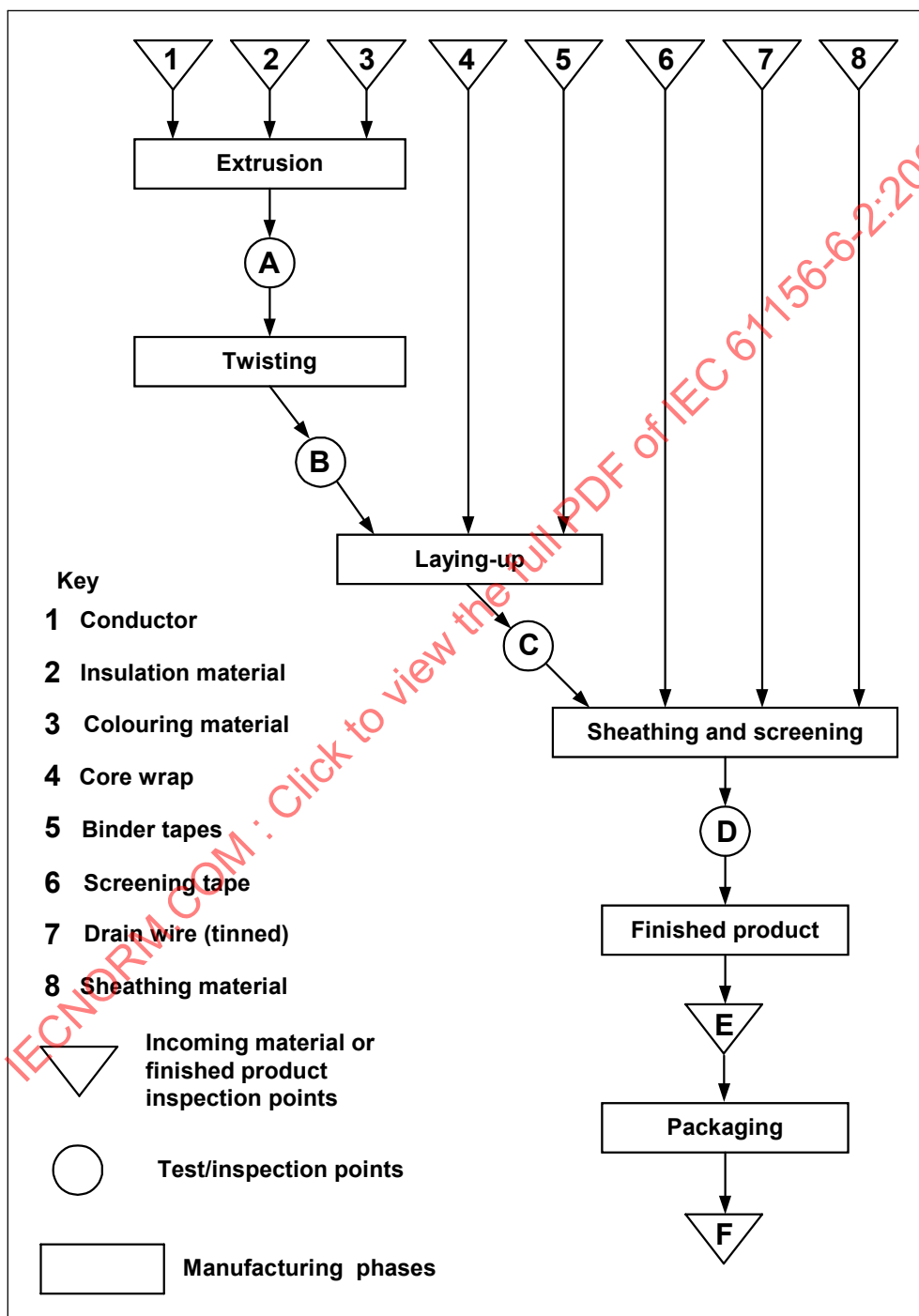
The maintenance of the Capability Approval shall be based on the examination of

- 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.

IECNORM.COM : Click to view the full PDF of IEC 61156-6-2:2002

Annex A (informative)

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



Annex B (informative)

Family : Symmetrical pair/quad cables for work area 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 XXXXX XXXX XXXX	 XXXXX XXXX	Copper stranded conductor: Min./Max. diameter Insulation thickness and diameter over the insulation Type of insulation Colour marking
2	Twisting	Twisting lines XXXXX XXXX	 XXXXX XXXX	Pairs and/or quads Minimum lay length Maximum lay length
3	Laying-up	XXXXX XXXX	XXXXX XXXX	Pairs and/or quads Minimum lay length Maximum lay length
4	Screening	Taping line XXXXX XXXX	 XXXXX XXXX	Longitudinal minimum overlap/ Helical minimum overlap
5	Sheathing	Extruder XXXXX XXXX	 XXXXX XXXX	Type of material Min./Max. outer diameter Min./Max. thickness
6	Final tests	Testing department		Some tests may be performed externally
7	Packaging	Delivery department		Maximum cable length Maximum reel dimensions