Nederlandse norm

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(en)

Communication cables - Part 4-2: General considerations for the use of cables - Guide to use

ICS 33.120.10

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NEN

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50290-4-2

July 2008

ICS 33.120.10

English version

Communication cables - Part 4-2: General considerations for the use of cables - Guide to use

Câbles de communication -
Partie 4-2: Considérations générales pour l'utilisation des câbles -
Guide d'utilisation

Kommunikationskabel -
Teil 4-2: Allgemeine Betrachtungen für die Anwendung der Kabel -
Leitfaden für die Verwendung

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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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

Ref. No. EN 50290-4-2:2008 E

Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 46X, Communication cables, with the help of the CENELEC Co-operating Partner EUROPACABLE (ECBL).

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50290-4-2 on 2008-02-01.

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) 2009-02-01

– latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2011-02-01

Contents

1 Scope

The scope of this European Standard is to help installers and cabling designers to understand the range of communication metallic cables available. To help this choice the fundamental and practical rules on how to use these cables are established.

The related cables are specified in the documents issued by CLC/TC 46X and its sub-committees.

These cables are:

- telecom cables used in access network,
- data communication twisted pairs cables,
- coaxial cables used in CATV.

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.

EN 50083 series	Cable networks for television signals, sound signals and interactive services
EN 50117 series	Coaxial cables used in cabled distribution networks
EN 50173 series	Information technology - Generic cabling systems
EN 50174 series	Information technology - Cabling installation
EN 50200	Method of test for resistance to fire of unprotected small cables for use in emergency circuits
EN 50288 series	Multi-element metallic cables used in analogue and digital communication and control
EN 50289-3-9	Communication cables - Specifications for test methods - Part 3-9: Mechanical test methods - Bending tests
EN 50289-4-16 [1)]	Communication cables - Specifications for test methods - Part 4-16: Environmental test methods - Circuit integrity under fire conditions
EN 50290 series	Communication cables
EN 50406 series	End user multi-pair cables used in high bit rate telecommunication networks
EN 50407-1	Multi-pair cables used in high bit rate digital access telecommunication networks - Part 1: Outdoor cables
EN 50441 series	Cables for indoor residential telecommunication installations

[1)] At draft stage.

3 Communication cable basics

Communication cables are the highways and arteries that provide a path for telecommunications devices. There is a general tendency to say that one transmission medium is better than another. In fact, each transmission medium has its place in the design of any communication system. Each has characteristics that will make it the ideal medium to use based on a particular set of circumstances. It is important to recognize the advantages of each and develop a system accordingly.

Factors to consider when choosing communication cable include:

- efficiency of transmission,
- cost,
- ease of installation and maintenance,
- availability.

4 Types of cables

When working with communication cables, an installer will deal with two basic types:

- balanced,
- unbalanced.

Balanced cabling involve twisted-pair and/or twinaxial twisted cables that are composed of one or more pairs of copper wires (see Figure 1).

Unbalanced cabling involves coaxial cable, that has only one centre conductor of either solid or stranded inner conductor and an outer concentric conductor. Most data and voice networks use twisted-pair cabling. Coaxial cable is now used primarily for CATV, satellite and video connections (see Figure 2).

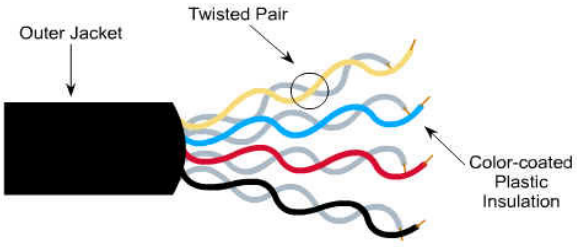

Figure 1 – Balanced cabling

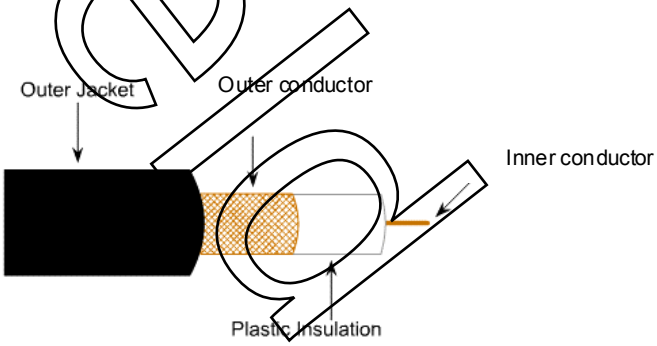

Figure 2 – Unbalanced cabling

4.1 Twisted pairs cables

4.1.1 Pair construction

There are two different pairing constructions:

- a pair made of two insulated wires twisted together (wire A and B in Figure 4);
- a quad made of four insulated wires twisted together, providing two pairs from a star formation (first pair wire A and B and second pair wire D and C in Figure 3);
- a pair made of two insulated wires twisted together;
- a quad made of four insulated wires twisted together, providing two pairs.

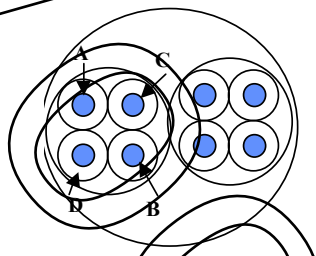

Figure 3 – Starquads

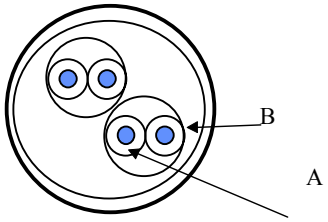

Figure 4 – Pairs

4.1.2 Pair counts

Telecommunications cable comes in many sizes, starting with a single pair of wires, up to and perhaps more than 4 200 pairs of wires. These pairs may be arranged in concentric layers or in bundles. A data communication terminal is fed normally with a maximum of 4 pairs, so the last part of the network is built with cables having 1 to 4 pairs. As the other parts of the network aggregate several terminal cables, they have a larger number of pairs. The highest number of pairs is encountered at the main communication switch. The main communication switch is then connected to global systems by satellite, fibre, radio, waveguide and coaxial (CATV).

The identification of each pair in the cable is made through an appropriate colour code that is given in the relevant standard or may be agreed between customer and manufacturer (see example in Figure 5).

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