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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



3/1706/CD

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SECRETARIAT:

Sweden

SECRETARY:

Mr Mikael Törnkvist

OF INTEREST TO THE FOLLOWING COMMITTEES:

TC 16,TC 17,TC 44

HORIZONTAL FUNCTION(S):

ASPECTS CONCERNED:

Safety

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TITLE:

Industrial systems, installations and equipment and industrial products - Labelling of cables and cores

NOTE FROM TC/SC OFFICERS:

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CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms and definitions	8
4 Rules.....	9
4.1 General requirements.....	9
4.2 Use of designated cable cores.....	10
4.3 Use of additional labelling	10
5 Identification labelling.....	12
5.1 General	12
6 Connection labelling	16
6.1 General.....	16
6.2 Local-end connection labelling	17
6.3 Remote-end connection labelling.....	18
6.4 Both-end connection labelling.....	19
7 Signal labelling	20
7.1 General.....	20
7.2 Labelling by signal designation.....	20
7.3 Labelling of cables for certain designated conductors	20
8 Composite labelling	21
9 Arrangement of additional labelling.....	22
9.1 General.....	22
9.2 Relative positions of the labelling	23
9.3 Characters to be used	23
10 Correspondence between labelling and documentation.....	23
11 Conformance to this standard	23
Annex A (informative) Examples of labelling	25
Bibliography.....	33

Figure 1 – Example of identification labelling of a single core cable (W23) and of a multi-core cable (W24) in which also the different cores are labelled 13

Figure 2 – Example of identification markings for a control cable (WGA23) and a low-voltage cable (WDB24) 14

Figure 3 – Example of identification labelling of cores where the initial part of the reference designation has been partly omitted 15

Figure 4 – Example of Identification markings for branch cables 16

Figure 5 – Example of local-end connection labelling 17

Figure 6 – Example of remote-end connection labelling for a connection inside a unit..... 18

Figure 7 – Example of remote-end connection labelling for a cable between different units 19

Figure 8 – Example of both-end connection labelling 19

Figure 9 – Example of local-end connection labelling combined with signal labelling..... 21

Figure 10 – Example of composite labelling in which both-end connection labelling used together with identification labelling and signal labelling 22

Figure 11 – Examples of arrangements of labelling on cores or cables.	22
Figure A.1 – Circuit diagram used as a basis for the examples	25
Figure A.2 – Example of identification labelling	26
Figure A.3 – Example of local-end labelling	27
Figure A.4 – Example of both-end connection labelling	28
Figure A.5 – Example of local end connection labelling with additional information	29
Figure A.6 – Example of signal labelling	30
Figure A.7 – Example of composite labelling (CL+R)	31
Figure A.8 – Example where use is made of the cable coloursBibliography	32
Table 1 – Example of connection table in which the cable cores are identified by means of codes for their colour	10
Table 2 – Connection table corresponding to Figure 1 with labelling	13
Table 3 – Connection table corresponding to Figure 2 with labelling	14
Table 4 – Connection table corresponding to Figure 2 with labelling	15
Table 5 – Wiring table corresponding to the markings in Figure 3	16
Table 6 – Marking of certain designated conductors.....	20
Table 7 – Methods of labelling defined in this standard	23

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL SYSTEMS, INSTALLATIONS
AND EQUIPMENT AND INDUSTRIAL PRODUCTS –
LABELLING OF CABLES AND CORES**

FOREWORD

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IEC 62491 has been prepared by subcommittee MT 62491: MAINTENANCE OF IEC 62491, of IEC technical committee TC3: DOCUMENTATION, GRAPHICAL SYMBOLS AND REPRESENTATIONS OF TECHNICAL INFORMATION. It is an International Standard.

This second edition cancels and replaces the first edition published in 2008. This edition constitutes technical revisions.

This edition includes the following significant technical changes with respect to the previous edition:

This edition expands the scope of the standard, and introduces several additions including the definition of connectors, requirements for digital and intermediate markings, and expressions for reference codes of cable types., ect.

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

FDIS	Report on voting
3/XXX/FDIS	3/XXX/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.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

For information on the colors applied in this document, see Annex A.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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

INTRODUCTION

Additional labelling of cables and cores is useful within larger systems or installations with many cores of the same colour or with many cables, and where therefore only the use of the designations provided by the cable manufacturer would be ambiguous.

Due consideration should be given to the fact that additional labelling will cause additional cost, usually increasing with the number of characters in the labelling string and the number of different labelling elements. The available space would also impose restrictions with regard to the number of characters, their height and the length of the labelling. As a general rule the use of additional labelling should therefore be limited to a necessary minimum and be kept as short as practicable.

However, also the advantages and benefits should be taken into considerations in choosing additional labelling of cables and cores.

It is important to notice that a single machine or a system has different needs of information in the different phases of its lifecycles (assembling, production, service and maintenance).

Additional labelling of cables and cores gives the following advantages:

- the possibilities to communicate and identify signals and connections across different involved engineering disciplines and departments like:
 - process engineering,
 - software engineering,
 - electrical engineering,
 - mechanical/fluid engineering,
 - control engineering;
- minimizing the time used to locate an eventual error (and the ~~reason~~ cause for it) in the test phase;
- saving time when locating an eventual error (and the ~~reason~~ cause for it) in the service and maintenance phase;
- remove the doubt of which core should be connected to which terminal, when replacing components that are placed close to each other;
- if used in pre-planning, it gives a clear view for panel-builders, electricians/technicians; service/maintenance and system controllers which will minimize misunderstandings regarding connections.

Besides being used in connections between terminal blocks, labelling can also be used when single core cables connect components inside units as: cubicle, pulpit, case, etc.; such methods make possible:

- a rapid and secure cabling between the terminals of two objects;
- a rapid visual check of cabling, not necessarily looking up in the circuit diagrams;
- a correct and secure change of an object during the maintenance operations of plants.

INDUSTRIAL SYSTEMS, INSTALLATIONS AND EQUIPMENT AND INDUSTRIAL PRODUCTS – LABELLING OF CABLES AND CORES

1 Scope

This document provides rules and guidelines for the labelling of cables and cores/conductors used in industrial installations, equipment and products, in order to maintain a clear relation between the technical documentation and the actual equipment and for other purposes. The following methods are described and designated: use of coloured cables and designated cores;

- additional identification labelling;
- additional connection labelling; and
- additional signal labelling.

This document is applicable to electric cables and fibre optic cables. However, the methods specified are general and suitable for labelling of other kinds of extended connections.

The physical design of the labels, the material to be used for the labels as well as cable manufacturers' product bound marking of cables and cores are not part of this standard.

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 60445, Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals and conductor terminations

IEC 60757, Code for designation of colours

IEC 61082-1:2014, Preparation of documents used in electrotechnology – Part 1: Rules

IEC 61175-1, Industrial systems, installations and equipment and industrial products – Designation of signals – Part 1: Basic rules

IEC 61666, Industrial systems, installations and equipment and industrial products – Identification of terminals within a system

IEC 81346-1, Industrial systems, installations and equipment and industrial products – Structuring principles and reference designations – Part 1: Basic rules

IEC 81346-2, Industrial systems, installations and equipment and industrial products – Structuring principles and reference designations – Part 2: Classification of objects and codes for classes

ISO/IEC 646, Information technology – ISO 7-bit coded character set for information interchange

3 Terms and definitions

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

3.1

conductor (of a cable)

part of a cable which has the specific function of carrying current

[SOURCE: IEC 60050-461:2008, 461-01-01]

3.2

cable

assembly of one or more conductors and/or optical fibres, with a protective covering and possibly filling, insulating and protective material

[SOURCE: IEC 60050-151:2001, 151-12-38]

3.3

core

insulated conductor

assembly comprising a conductor with its own insulation (and screens if any)

Note 1 to entry: In North American usage, the core of a cable has been defined as the assembly of components of a cable lying under a common covering such as the IEC 60050-461:2008, 461-04-0sheath. Such usage is deprecated.

[SOURCE: IEC 60050-461:2008, 461-04-04]

3.4

connector

device used for connecting and disconnecting with appropriate mating parts

Note 1 to entry: A connector has one or more contact members

[SOURCE: IEC 60050-151:2001, 151-12-19]

3.5

terminal

conductive part of a device, electric circuit or electric network, provided for connecting that device, electric circuit or electric network to one or more external conductors

Note 1 to entry: The term "terminal" is also used for a connection point in circuit theory.

[SOURCE: IEC 60050-151:2001, 151-12-12]

3.6

terminal block

assembly of terminals in a housing or body of insulating material to facilitate interconnection between multiple conductors

[SOURCE: IEC 60050-581:2008, 581-26-26]

3.7

terminal designation

identifier of a terminal with respect to the object to which it belongs, related to one defined aspect

[SOURCE: IEC 61666:2010+AMD1:2021, 3.10]

3.8

signal designation

unambiguous identifier of a signal within a system

[SOURCE: IEC 61175-1:2015, 3.6]

3.9**reference designation**

identifier of a specific object formed with respect to the system of which the object is a constituent, based on one or more aspects of that system

[SOURCE: IEC 81346-1:2022:, 3.11]

3.10**labelling (of a cable or core)**

label or labels attached to a cable or core indicating appropriate characteristics

3.11**identification labelling**

labelling showing the identifier of an object as a constituent of a specific installation, system, equipment or product

3.12**connection labelling**

labelling of a cable or core showing the identifier of the terminal, connector, terminal block or equipment to which it is connected

3.13**local-end connection labelling**

system of labelling of cables and cores where the labelling of the end of the cable or core refers to the terminal, connector, terminal block or equipment to which it is connected

3.14**remote-end connection labelling**

system of labelling of cables and cores where the labelling of the end of the cable or core refers to the terminal, connector, terminal block or equipment to which the other end of it is connected

3.15**both-end connection labelling**

system of labelling of cables and cores where each end of a cable or core is provided with local-end connection labelling and remote-end connection labelling

3.16**signal labelling**

system of labelling of cables and cores used as a supplement to other labelling generally based on the signal(s) carried by the cable or core

3.17**composite labelling**

system of labelling where two or more of the identification labelling, connection labelling and signal labelling systems are used together

4 Rules**4.1 General requirements**

Cables and cores shall be recognizable at each end; it shall be possible to relate cables and cores to the technical documentation.

This may be carried out by:

- the designation and marking provided by the manufacturer of the cable, see 4.2, or
- an additional labelling, see 4.3.

Intermediate markings may be applied and their use should be determined by the actual environment of the cable connections. Generally, when the cables are of the considerable length, multiple intermediate markings should be applied.