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International
standards on technical
documentation

documentation

International Electrotechnical Commission

The whole life cycle of a product, system or installation needs documentation.



International standards on technical documentation

Standards on technical documentation developed by the IEC address the following important business trends:

Documentation is part of the product, system or installation

Users and societies are increasingly dependent on complex systems. The demand for installations or systems that are safe, easy to operate and to maintain is increasing.

Documents and information from different sources need to be integrated

Companies concentrate on their core business and purchase products and subsystems from other suppliers. Consequently, the complete documentation comprises several subsets that will be exchanged and studied together.

Multidisciplinary environment

Complex systems often involve different technologies, of which electrotechnology is one. This calls for co-ordinated methods and rules over the technological boundaries. Standardization therefore has to be run in close co-operation with similar standards bodies for other areas.

The whole life cycle of a product, system or installation needs documentation

Documents link the different phases of the life cycle. Standardization will focus on the requirements for engineering and manufacturing, and also on the earlier and later phases in the cycle.

Information technology changes the products, systems and installations

The use of information technology in plants and installations standardizes the connections among components further, and *the traditional documentation of circuits can be expected to decrease in importance*. However, documentation on higher conceptual levels (which are not necessarily "electrical") can be expected to increase in importance. Electronic documentation will to a high degree either be physically integrated into the product or made available via computer networks.

Information technology changes the engineering and documentation process

From computer aided drawing systems and the presentation of the visual image of a document, systems have developed into highly complex data modelling systems storing the captured information in a database. A document is becoming the representation of such stored information, generated by pre-defined electronic templates.

IEC TC 3

Initially entrusted with overall responsibility for standardizing symbols of the IEC, Technical Committee 3 (Documentation and graphical symbols), also strives to meet the market needs which result from the present trends.



Work is managed by TC 3 – also in charge of the newly created Symbols Database and of Symbols for Diagrams – and allocated to two subcommittees.

TC 3 establishes rules for preparing documentation, diagrams, reference designations, and presentation of the information with a view towards electronic exchange. SC 3C is in charge of graphical symbols for use on equipment, and SC 3D deals with data sets for libraries to enable handling the information in a computer sensible form.

TC 3 co-operates with other standardization bodies active in this field, notably ISO.

The main publications

Users may access the Symbols Database, which is drawn from IEC 60617 and 60417, and consult publications which cover a wide range of topics in the field of technical documentation. A complete list appears in the inlay of this pamphlet.

IEC 60617 contains more than 1 200 internationally recognized symbols for diagrams and indexes.

IEC 60417 contains more than 650 internationally recognized symbols for use on electrotechnical equipment and relevant surveys.

IEC 61082 provides rules for preparing the kinds of documents used most widely, while IEC 60848 defines language GRAFCET for sequential function charts.

IEC 61346 is a very basic standard covering principles for structuring technical information and related identification needs. Relying on this are, among others, IEC 61175 and IEC 61666.

IEC 61355 defines the kinds of documents to be used in a system documentation and their classification.

A number of standards are more directed to preparing and handling documentation with a goal to make the information sensible to computers. This includes:

- IEC 61360, which provides unambiguous definitions and identifications for component information.
- IEC 61286, which provides a character set specifically developed for electrotechnical purposes.
- IEC 81714, which contains (besides basic design rules of graphical symbols) information on how to associate technical data with graphical symbols in CAD systems.

Current work

TC 3 regularly revises and updates existing standards. At present, this is the case for IEC 60617, IEC 60417 and IEC 61360.

To serve industry needs for quick updating and easy electronic access to standards, procedures are now being established in connection with creation of an online database of symbols. This will allow standardization work and publication to be carried out "piece by piece" via the internet.

New topics under discussion include: rules for the preparation of documents such as instructions and parts lists; classification and coding of objects; application guidelines for the reference designation system; classification and coding of shapes of electric components for placement on printed wiring boards.

Through a joint working group, IEC TC 3 also takes an active part in developing standardized information models for electrotechnical systems and equipment of ISO 10303 (STEP): Application Protocol AP210 and AP212.



Future work

Projects that are under consideration include: meta data for document management; integrated software and hardware documentation; further work on data element type definitions in co-operation with relevant committees.

IEC

The IEC has served the world's electrical industry since 1906, developing international standards to promote quality, safety, performance, reproducibility and environmental compatibility of materials, products and systems.

The world-wide use of IEC standards supports the transfer of electrotechnology, assists certification and promotes international trade of uniform high-quality products and services. International standards establish objective specifications that both buyer and seller can rely on. For buyers, they widen the range of choices and lower costs, primarily because they often increase the number of competitors. For sellers, global standards broaden the number of potential customers and reduce the cost of meeting their needs. In short, for everyone in society, international standards raise the overall efficiency and productivity of the economy.

The IEC membership, which now comprises more than 50 countries, includes all the world's major trading nations. This

membership collectively represents about 85 percent of the world's population and 95 percent of the world's electrical generating capacity.

More information

More information about the work on documentation standards carried out in IEC TC 3 can be obtained through any of the National Committees of the IEC, the addresses of which are available from the IEC Central Office or from the secretary of any IEC TC.

Up-to-date information about the work items under discussion can be obtained from the IEC's website, at <http://www.iec.ch> and that of TC3 at <http://www.iec.ch/tc3>.



Documentation on higher conceptual levels can be expected to increase in importance.



For further information

The IEC's website may be found at: www.iec.ch.
For further information about the IEC, please contact
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List of standards prepared by Technical Committee 3 of the IEC

documentation

standards

International Electrotechnical Commission

● Structuring, identification, and related topics

IEC 61346-1 (1996)	Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations - Part 1: Basic rules
IEC 61346-2 (2000)	Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations - Part 2: Classification of objects and codes for classes
IEC 61346-3 (2001)	Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations - Part 3: Application guidelines
IEC 61346-4 (1998)	Industrial systems, installations and equipment and industrial products - Structuring principles and reference designation - Part 4
IEC 61175 (1993)	Discussions of concept Designations for signals and connections

IEC 61666 (1997)	Industrial systems, installations and equipment and industrial products - Identification of terminals within a system
IEC 62023 (2000)	Structuring of technical information and documentation
IEC 62027 (2000)	Preparation of parts lists
IEC 62079 (2001)	Preparation of instructions - Structuring, content and presentation

● Documentation and document kind definitions

IEC 61355 (1997)	Classification and designation of documents for plants, systems and equipment
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● Preparation of various document kinds

IEC 60848 (1988)	Preparation of function charts for control systems
IEC 61082-1 (1991)	Preparation of documents used in electrotechnology - Part 1: General requirements
IEC 61082-2 (1993)	Preparation of documents used in electrotechnology - Part 2: Function-oriented diagrams
IEC 61082-3 (1993)	Preparation of documents used in electrotechnology - Part 3: Connection diagrams, tables and lists
IEC 61082-4 (1996)	Preparation of documents used in electrotechnology - Part 4: Location and installation documents
IEC 61082-6 (1997)	Preparation of documents used in electrotechnology - Part 6: Index
	IEC 61352 (2000) Mnemonics and symbols for integrated circuits
	IEC 61785 Factory-built wiring systems

● Graphical symbols for diagrams

Standards for symbol appearance

IEC 60617-1 (1985)	Graphical symbols for diagrams. Part 1: General information, general index. Cross-reference tables
IEC 60617-12 (1991)	Graphical symbols for diagrams - Part 12: Binary logic elements
IEC 60617-13 (1993)	Graphical symbols for diagrams - Part 13: Analogue elements
IEC 61734 (1997)	Application of IEC 60617-12 and IEC 60617-13 standards
IEC 61352 (2000)	Mnemonics and symbol for integrated circuits

Please note:

IEC 60617-2 to IEC 60617-11 are available in an on-line database that can be accessed at: www.domino.iec.ch/symbols

Supporting standards (ISO/IEC standards)

IEC 81714-2 (1998)	Design of graphical symbols for use in the technical documentation of products. Part 2: Specification for graphical symbols in a computer sensitive form including graphical symbols for a reference library, and requirements for their interchange.
IEC 81714-3 (1998)	Design of graphical symbols for use in the technical documentation of products. Part 3: Classification of connect nodes, networks and their encoding.
IEC 61286 (2001)	Information technology - Coded graphic character set for use in the preparation of documents used in electrotechnology and for information interchange

IEC 82045-1 (2001)

Document management - Part 1:
Principles and methods

● Graphical symbols to be used on equipment

Standard for symbol appearance

IEC 60417*

Graphical symbols for use on equipment. Index, survey and compilation of the single sheets

Supporting standard (*ISO/IEC standard*)

IEC 80416 (2001)

General principles for the formulation of graphical symbols

● Data element types

IEC 61360-1 (2002)

Standard data element types with associated classification scheme for electric components - Part 1: Definitions - Principles and methods

IEC 61360-2 (2002)

Standard data element types with associated classification scheme for electric components - Part 2: Express dictionary schema.


IEC 61360-3 (1995)

Standard data element types with associated classification scheme for electric components - Part 3: Maintenance and validation procedures

IEC 61360-4 (1997)

Standard data element types with associated classification scheme for electric components - Part 4: IEC reference collection of standard data element types, component classes and terms

*Updated regularly.



For further information

More information about the work on documentation standards carried out in IEC TC3 can be obtained through any of the National Committees of the IEC, the addresses of which are available from the IEC Central Office or from the secretary of any IEC TC.

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