PUBLISHED DOCUMENT

PD CLC/TR
62125:2008

Environmental statement specific to TC 20 — Electric cables

ICS 13.020.01; 29.060.20

BSI
British Standards

National foreword

This Published Document is the UK implementation of CLC/TR 62125:2008. It is identical to IEC/TR 62125:2007.

The UK participation in its preparation was entrusted to Technical Committee GEL/20, Electric cables.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 June 2008

ISBN 978 0 580 55852 8

Amendments/corrigenda issued since publication

Date	Comments

TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CLC/TR 62125

April 2008

ICS 13.020.01; 29.060.20

English version

Environmental statement specific to TC 20 - Electric cables
(IEC/TR 62125:2007)

Déclaration environnementale spécifique au TC 20 - Câbles électriques (CEI/TR 62125:2007)

Umwelterklärung für TC 20 - Kabel und isolierte Leitungen (IEC/TR 62125:2007)

This Technical Report was approved by CENELEC on 2008-01-25.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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. CLC/TR 62125:2008 E

Foreword

The text of the Technical Report IEC/TR 62125:2007, prepared by IEC TC 20, Electric cables, was submitted to vote and was approved by CENELEC as CLC/TR 62125 on 2008-01-25.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the Technical Report IEC/TR 62125:2007 was approved by CENELEC as a Technical Report without any modification.

CONTENTS

INTRODUCTION

The cable sector has always considered the impact of electric cables on the environment, in relation to their service conditions, and particularly for utility cables. Over the years, energy utilities have considerably increased their requirements to take into account the environmental impact of electric cables.

IEC TC 20 is constantly reviewing its approach to the incorporation of environmental aspects into standards for electric cables and their components. Environmental considerations should be included in both design and redesign work with respect to the raw materials used, energy consumption and emissions during production, end of life disposal or recycling, and in-service performance.

For example, there is an environmental demand for more efficient operation of electric cables (lower transmission losses, reduced heating effects, and, as a result, lower emission of greenhouse gases). There is some information on suitable cable design parameters to achieve lower losses. Unfortunately, diverse pressures from a number of interests usually result in the need to compromise in this area.

ENVIRONMENTAL STATEMENT SPECIFIC TO IEC TC 20 – ELECTRIC CABLES

1 Scope

IEC/TR 62125, which is a technical report, is intended to give assistance to standard-writers of IEC Technical Committee 20, to take into account the relevant environmental aspects as far as they are specific to electric cables in normal use. It also assists them to keep in mind a clear methodology when considering these aspects and when checking possible interaction of the normative requirements with the environment. Also, these guidelines assist standard-writers to avoid too simple or too stringent requirements that might not achieve a favourable global result.

This technical report, by its very nature, is not prescriptive and does not limit innovation.

NOTE 1 The term 'environment', as used in this report, differs from the term as used in those IEC standards dealing with the impact of environmental conditions on electrotechnical products (see 3.1).

NOTE 2 As regards the impact of environmental conditions on the performance of products, reference is made to IEC 60068, IEC 60721 and IEC Guide 106.

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 Guide 109, *Environmental aspects – Inclusion in electrotechnical product standards*

ISO Guide 64, *Guide for the inclusion of environmental aspects in product standards*

ISO/TR 14062, *Environmental management – Integrating environmental aspects into product design and development*

3 Terms and definitions

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

3.1
environment
all attributes which affect the quality of life, such as water, air, and soil quality, conservation of energy and materials and avoidance of waste

3.2
life cycle
consecutive and interlinked stages of the manufacture, installation, use, and disposal of a product, from raw material acquisition or generation of natural resources to the final disposal

NOTE The raw material is considered to be the base raw material, incorporated in relevant products.

3.3
life cycle approach
methodology of taking into account the life cycle of a product in order to assess the consequences on the environment

3.4
environmental impact of a product
any change to the environment, whether adverse or beneficial, wholly or partially resulting from the life cycle of a product.

4 Implementation of TC 20's environmental policy

4.1 General principles

Consideration should be given to the design and performance of the electric cable over its full life cycle.

The choices made during the design phase will largely decide what the impact will be during each phase of the product's life cycle.

Therefore, it is recommended:

- to take environmental aspects into account from the initial phases of product design;
- to avoid too simple or too stringent approaches in setting the acceptance levels of performance requirements;
- to ensure that potentially safe alternative designs and alternative materials are afforded proper attention, and not excluded because of historical considerations;
- to optimize combinations of materials;
- to avoid materials and designs that will introduce harmful effects to the external environment;
- to organize the feedback of experience which enhances continuous improvement of product performances.

4.2 Environmental aspects for cable standards

To improve the approach to incorporating environmental aspects into standards, IEC TC 20 proposes to:

– promote IEC Guide 109 to its WGs and standard-writers;
– take into consideration, and evaluate, any suggestions and/or recommendations that will be made by specific environmental committees;
– start to incorporate environmental matters into all its new standards, and when amending existing standards;
– start with the basic principles in the implementation of environmental matters in standards;
– help standards-writers in their work with a checklist that is based on IEC Guide 109 and specifically focused on power cables covered by TC 20. This checklist will be updated and improved by TC 20 as more experience is gained in the matter.

4.3 Environmental check list for power cable standards

The check list given in the attached Annex A is designed specifically to guide and help IEC TC 20 cable standards-writers in taking into consideration the environmental impacts from the design, production and use of electric power cables. This list is neither exhaustive nor mandatory. Not every item on the list will apply to every situation. The list will be updated and revised according to the knowledge that will be gained in this field by the TC 20 committee, and taking into account views from the specialist environmental committees of IEC (IEC technical committee 111: Environmental standardization for electrical and electronic products and systems). The list relates both to the complete cable, and to its components (conductor, insulation system, metallic screen, fillers, binders, tapes, bedding, armouring and sheath).

Environmental impacts must be balanced against other factors, such as product function, performance, health and safety, cost, marketability and quality; legal and regulatory requirements.

4.4 Life cycle assessment of cables

It is not considered necessary at this stage to carry out a detailed life cycle assessment of cables.

Therefore in Annex A no reference is made to carrying out a detailed cable LCA (life cycle assessment). However, the checklist demonstrates “life-cycle thinking”. It takes into account the main findings of LCA work in the field of electric cables. In this respect LCA indicates that energy loss and materials use are most significant.

NOTE Energy losses during service are dominated either by the length of time under load, which could be many decades for MV or HV cables in transmission or distribution networks, or by a combination of time under load and the huge size of the network (thousands of kilometres) for low voltage distribution cables.

A first approach on general considerations of a life cycle assessment of electric cables is given in Annex B. This information is based on the work of ISO/TC207/WG1.

Annex A
(informative)

Check list

All components in the cable design should be evaluated for their environmental aspects, and some of the following may be taken into consideration:

A.1 Preliminary considerations

1) Has it been checked before starting standardization work on a new cable design that there is no possibility to adopt, with slight amendments, a cable design already standardized, and for which environmental aspects have already been taken into consideration?
2) Has the raw material production been considered and evaluated for environmental constraints?

A.2 Design considerations

1) Has it been considered to choose a conductor with the lowest energy consumption and/or lowest CO_2 emission during manufacturing of the product?
2) Has the possibility to use recycled materials been considered, for instance as fillers? Has the consideration also taken into account the environmental impact of such recycling (parameters like collection conditions, regeneration cycle, quality of the recycled material, losses, energy consumption, substitution rate)?
3) Has the cable been designed in such a way as to minimize the use of raw materials, without affecting the cable safety, reliability and cost?
4) Has consideration been given to lists of international, regional or national regulated substances, so that those for which restrictions apply can be avoided or reduced to a minimum within all parts and components of the cable?
5) Has it been checked that the components do not release hazardous substances into the environment during raw material production, manufacturing of the cable, cable in use and final disposal of the cable?
6) Has it been considered to select materials/components that can easily be separated from other cable components, in order that any available and ecologically efficient waste management option, including energy recovery, can be used?
7) Can the different components easily be identified?
8) Has it been considered to minimize the number of different materials in the cable design, without affecting the safe operation of the cable, its reliability and cost?

A.3 Production considerations

1) Has reference been made to the use of an Environmental Management System, such as ISO 14000, for production?
2) Has efficient use of energy and resources been considered?
3) Have measures for reduction of emission and waste been considered?

A.4 Considerations for use and end of life phase

1) If a change in a product is also considered to give a change in the environmental constraint, have measures been taken to give information to the market regarding the constraints of the products already in stock or on the market?
2) Has information been given to the user on the fact that the choice of transmission/distribution voltage and the conductor cross-section will seriously influence the current transmission losses?
3) Has information been given how to recover/recycle the components/materials in the cable at end of life of the product (which may be many decades), including the possibility of energy exploitation?
4) Although not a part of the cable standard, has consideration been given to waste management of any packaging associated with delivery of the cable including the material and the size of cable drums?
5) Has consideration been given to minimize the energy for transportation with regard to cable delivery?

Annex B
(informative)

Life cycle considerations

B.1 Inputs and outputs to be considered

B.1.1 General

Figure B.1, based on the work of ISO/TC 207/WG 1, presents the correlation between principal steps in the environmental life cycle of a product, the product's functional operation and performance requirements, its design, and other external considerations.

At each step of a product's life cycle, the materials and energy balance should be considered. When data are available, the span of the life cycle study should cover from "cradle to grave".

Figure B.1 also illustrates a product improvement cycle that leads to pollution prevention and resource conservation.

B.1.2 Inputs and outputs

Environmental impacts of products are largely determined by the inputs that are used and the outputs that are generated at all stages of the product's life cycle. Changing any single input, either to alter the materials and/or energy used, or to influence a single output, may affect other inputs and outputs (see Figure B.2).

NOTE For the electrotechnical sector, other releases, according to Figure B.2, could comprise electromagnetic emissions, ionizing and non-ionizing radiation and emission to soil.

B.1.3 Inputs

Inputs fall into two broad categories:

a) Material inputs

Material components used during the life cycle of a product shall also be considered. These impacts can include depletion of renewable and non-renewable resources and environmental or human exposure to hazardous materials. Material inputs can also contribute to the generation of waste, emissions to air, effluents to water, and other releases. Material inputs associated with the raw material acquisition, manufacturing, transportation (including packaging and storage), use/maintenance, re-use/recycling, and disposal of products can produce a variety of environmental impacts.

NOTE 1 With respect to the control of hazardous substances, limitations on the use of substances are subject to differing laws and practices in different countries. These limitations may vary according to the level of knowledge of the environmental impact of these substances. This type of information is therefore not given in this guidance.

b) Energy inputs

Energy inputs are required at most stages of a product's life cycle such as raw material acquisition, material transportation, manufacturing, product transportation, use/ re-use/ recycling/ maintenance and disposal. Each energy source has its own set of environmental impacts.

NOTE 2 Energy consumption during the use of an electric cable may create the greatest environmental impact at any stage of the product life. Higher transmission/distribution voltage and larger conductor cross-section may diminish the energy consumption (see IEC 60287-3-2).

B.1.4 Outputs

Outputs generated during a product's life cycle generally comprise the product itself, intermediates and by-products (e.g. during the manufacture of cable components like conductors and insulation or sheath material), air emissions, water effluents, waste materials and other releases.

Air emissions comprise the releases of gases or vapours or particulates to the air. Releases of toxic, corrosive, flammable, explosive, acidic or odorous substances may adversely affect flora, fauna, human beings, buildings or contribute to other environmental impacts such as depletion of stratospheric ozone or formation of smog. Air emissions include releases from point as well as diffuse sources, treated as well as untreated releases, and releases from normal operation as well as accidental releases.

Emission to water effluents comprise the discharge of substances to a watercourse, being either surface or ground water. The discharge of nutrients or toxic, corrosive, radioactive, persistent, accumulating or oxygen-depleting substances may give rise to adverse environmental impacts including various pollution effects on aquatic ecosystems and undesirable eutrophication of natural waters. Water effluents include discharges from point as well as diffuse sources, treated as well as untreated discharges, and discharges from normal operation as well as accidental discharges.

Waste materials comprise solid or liquid materials or products. They may be produced at all stages of a product's life cycle.

Waste materials are subject to recycling, treatment, recovery or disposal techniques, and are associated with further inputs and outputs, which may contribute to adverse environmental impacts.

EXAMPLE Disposal of products

Provision should be made that products, which have to be replaced, can be disposed of in such a way as to minimize the environmental impacts.

As TC 20 electric cables have a very long life time, the impacts linked to their end of life are difficult to assess on account of the lack of knowledge of the elimination or recovery techniques available in the future.

For the time being the most usual solution for TC 20 cables is through disassembly (mechanical separation of metal and non-metallic components) and the usual waste management procedures.

When possible, and when environmentally beneficial, standards should state requirements which provide easier disassembly for the purpose of isolating benign and hazardous materials and encouraging re-use and facilitate recycling of materials.

Other releases may encompass emissions to soil, noise and vibration, radiation and waste heat.

B.2 Techniques for identifying relevant environmental impacts (and introducing environmental aspects in product standards)

A first step should be to identify, for each standard or set of standards, which environmental aspect(s) is(are) mostly concerned by the products covered by the standards.

However this cannot be determined by too simple an analysis of products.

For each standard or set of standards, experts should determine the relevant environmental aspects by carrying out a life cycle approach, also easy to use by designers, in order to detect:

- which products have the same type of environmental impacts;

- for this product or product family, which environmental aspects will be most influential in the environmental impact of the product.

Such an analysis will help to establish the priorities to be dealt with (see Annex A).

The objective of this approach is not to establish specific performance criteria, but to help to improve the environmental impacts of the product covered by the relevant standard or set of standards.

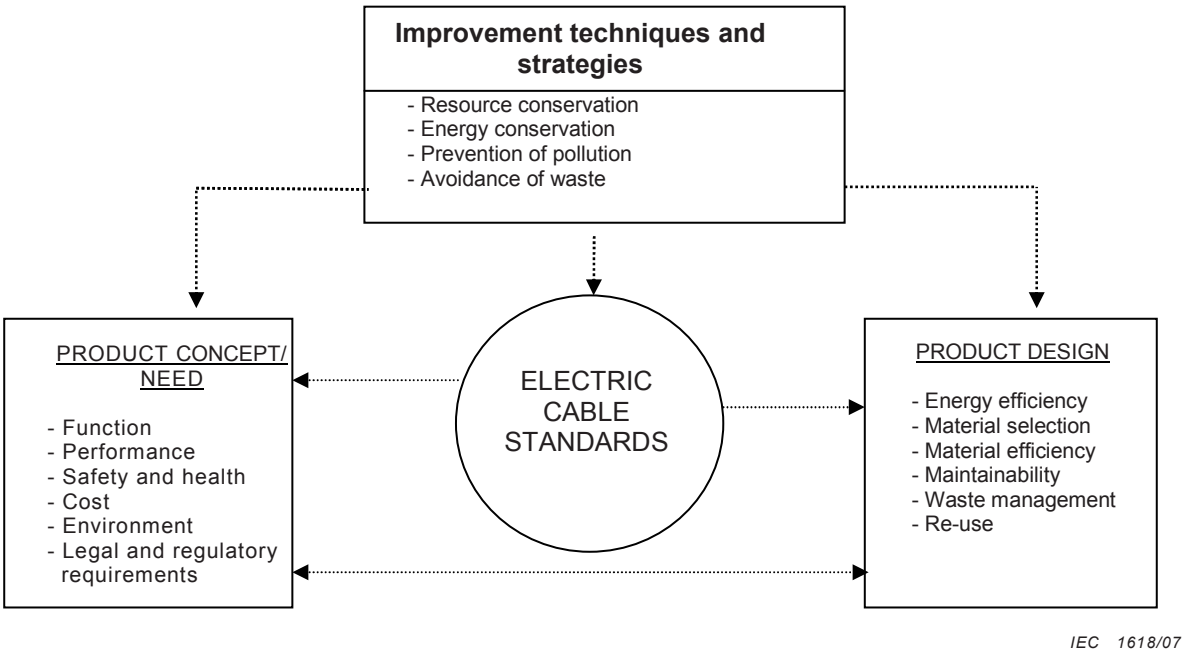

Figure B.1 – Environmental aspects in electric cable standards relating to cable concept and design

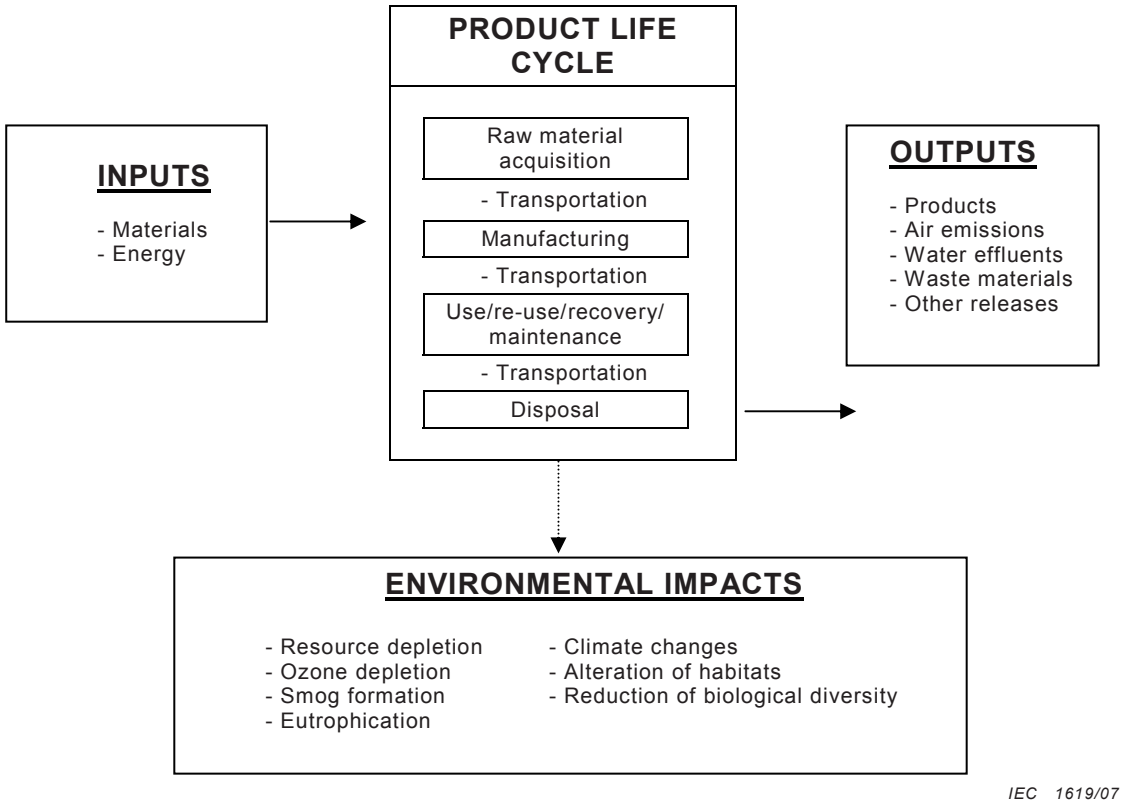

Figure B.2 – Environmental aspects in electric cable standards relating to the life cycle

Bibliography

IEC 60068 (all parts), *Environmental testing*

NOTE Harmonized in EN 60068 series (not modified).

IEC 60287-3-2, *Electric cables – Calculation of the current rating – Part 3-2: Sections on operating conditions – Economic optimization of power cable size*

IEC 60721 (all parts), *Classification of environmental conditions*

NOTE Harmonized in EN 60721 series (not modified).

IEC Guide 106, *Guide for specifying environmental conditions for equipment performance rating*

ISO/IEC Guide 2: *Standardization and related activities – General vocabulary*

ISO 14000 (all parts), *Environmental management systems*

ISO 14001: *Environmental management systems – Requirements with guidance for use*

NOTE Harmonized as EN ISO 14001:2004 (not modified).

ISO 14040: *Environmental management – Life cycle assessment – Principles and framework*

NOTE Harmonized as EN ISO 14040:2006 (not modified).

ISO 14050: *Environmental management – Vocabulary*

———————

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC Guide 109	-[1)]	Environmental aspects - Inclusion in electrotechnical product standards	-	-
ISO Guide 64	-[1)]	Guide for the inclusion of environmental aspects in product standards	-	-
ISO/TR 14062	-[1)]	Environmental management - Integrating environmental aspects into product design and development	-	-

[1)] Undated reference.

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: +44 (0)20 8996 9000. Fax: +44 (0)20 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: +44 (0)20 8996 9001. Fax: +44 (0)20 8996 7001. Email: orders@bsi-global.com. Standards are also available from the BSI website at http://www.bsi-global.com.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: +44 (0)20 8996 7111. Fax: +44 (0)20 8996 7048. Email: info@bsi-global.com.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: +44 (0)20 8996 7002. Fax: +44 (0)20 8996 7001. Email: membership@bsi-global.com.

Information regarding online access to British Standards via British Standards Online can be found at http://www.bsi-global.com/bsonline.

Further information about BSI is available on the BSI website at http://www.bsi-global.com.

Copyright

BSI
389 Chiswick High Road
London
W4 4AL