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TECHNICAL REPORT

RAPPORT TECHNIQUE

Environmental statement specific to IEC TC 20 – Electric cables

Déclaration environnementale spécifique au TC 20 de la CEI – Câbles électriques

IEC/TR 62125:2007

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ENVIRONMENTAL STATEMENT SPECIFIC TO IEC TC 20 – ELECTRIC CABLES

FOREWORD

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IEC/TR 62125, which is a technical report, has been prepared by IEC technical committee 20: Electric cables.

This report should be used in conjunction with ISO Guide 64, with technical report ISO/TR 14062, and with IEC Guide 109.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
20/868/DTR	20/880/RVC

Full information on the voting for the approval of this technical report 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 the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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- withdrawn,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

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?