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Replacing GB/T 20877-2007

Guide on inclusion of environmental aspects in electronic and electrical product standards

(IEC Guide109:2012, Environmental aspects - Inclusion in Electrotechnical
product standards, MOD)

电子电气产品标准中引入环境因素的指南

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Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This Standard replaces GB/T 20877-2007 *Environmental aspects - Inclusion in electrotechnical product standards*.

Main technical modifications between this Standard and GB/T 20877-2007 are as follows:

- modified the standard name to “Guide on inclusion of environmental aspects in electronic and electrical product standards”;
- modified the terms as follows:

deleted “standard writers” and “wastes” (see 3.17 and 3.18 of Edition 2007);

modified “end life” to “end of life”, “life cycle concept” to “life cycle thinking”, “recyclability” (可回收性 in Chinese) to “recyclability” (可再生利用性 in Chinese), “retrievability” to “recycling” (see 3.1, 3.10, 3.15, 3.16 of this Edition, 3.1, 3.10, 3.15, 3.16 of Edition 2007);

made editorial modifications on other terms except “input” and “output”.

- The following modifications were made to the content:
 - modified “4.2 Product standard and environment” in Clause “4 General principles which product standard and environment need to consider” to “4.2 Impact of the provisions of the product standards on the environment” and merged into the content of “4.2.1 General principle”; modified “4.2.2 Environmental impact” to “4.3 Environmental strategy” (see Clause 4 of this Edition, Clause 4 of Edition 2007);
 - deleted Clauses “5 Impact of the provisions of the product standards on the environment, and the role of standard writers” and “7 Methods used when considering environmental factors during the process of product design and development” (see Clause 5 and Clause 7 of Edition 2007);
 - modified Clause “6 Input and output that should be considered in the development of product standards” to “5 Input and output that should be considered in the development of product standards” (see Clause 5 of this Edition, Clause 6 of Edition 2007).

This Standard uses redrafting method to modify and adopt IEC Guide 109:2012 *Environmental aspects - Inclusion in Electrotechnical product standards*.

This standard has structural changes compared to IEC Guide 109: 2012. It deleted the clause of normative references because there were no specific documents.

The editorial differences between this Standard and IEC Guide 109: 2012 as well as reasons are as follows:

- in order to keep consistent with the present standard system, modified the standard name to “Guide on inclusion of environmental aspects in electronic and electrical product standards”;
- deleted “IEC Environmental Policy” in the introduction of IEC Guide 109:2012.

This Part was proposed by and shall be under the jurisdiction of National Environmental Committee on Electrical and Electronic Products and Systems of Standardization Administration of China (SAC/TC 297).

The drafting organizations of this Standard: Mechanical Industry Beijing Institute of Electrical and Technical Economics, Shanghai Electrical Apparatus Research Institute (Group) Co., Ltd., Changshu Switch Manufacturing Co., Ltd., China Electrical Equipment Industry Association, China Quality Certification Center, Shanghai Cable Research Institute, China Household Electrical Appliances Research Institute, Shenzhen Xinyu Central Standard Technology Co., Ltd., Rockwell Automation (China) Co., Ltd., SGS - CSTC Standards Technical Services (Shanghai) Co., Ltd., Philips (China) Investment Co., Ltd., Beijing ABB Low Voltage Electrical Appliance Co., Ltd.

Main drafters of this Standard: Teng Yun, Zhang Liang, Huang Huijie, Zhou Jianxing, Ma Qiju, Sun Jiansheng, Zhu Yan, Xiao Di, Song Weihong, Du Juan, Zhang Lingzi, Wang Zhongdan.

Versions of standard substituted by this Standard are:

- GB/T 20877-2007.

(LCA) for life cycle thinking (LCT). IEC62430 provides information for all interested parties on how to integrate ECD principles into the design and development of products. Standards writers are not required to apply the LCA principles, but are encouraged to use the ECD principles whenever possible.

Manufacturers can capture more detailed design scenarios and reasons for supporting them until more data is available. This approach broadens knowledge based on these options and options, in addition to generating specific environmental standardization requirements, as well as helping to recycle and discard products at end-of-life (EoL).

In this context, it is important to note that the standard compilers should carefully consider the environmental aspects of the test method when specifying test methods.

Standards writers need to compare environmental data for materials and substances. In any case, they may be careful to process the information derived from the LCA study when making the choices required by the standard. Consultation may be required with specialized environmental factors research institutes.

Guide on inclusion of environmental aspects in electronic and electrical product standards

1 Scope

This Standard specifies the guide on consideration of factors of which products shall have an impact on the environment when standard writers are stipulating standards for electronic and electrical products. Its purposes are as follows:

- a) to enhance awareness of the positive and negative environmental impact of the provisions of the product standards;
- b) to briefly describe the relationship between product standards and the environment;
- c) helping to identify the terms in product standards that may cause improvement on environmental performance and avoid the terms that may cause negative effects on environment;
- d) emphasize that to stipulate on environmental factors during the development of product standards is complex, which requires weighing various factors;
- e) while stipulating on environmental factors during the development of product standards, life cycle thinking is recommended.

This Standard is applicable to writers of product technical standards and norms and consistent with ISO Guide 64 as much as possible.

The stipulation of standardization document for environmental awareness design specifically for electrical and electronic products or industries should be based on IEC 62430.

2 Terms and definitions

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

2.1 EoL; end of life

life cycle stage after the product eventually exits the stage of use

[rewriting IEC 62075:2008, definition 3.4]

product standard. And these environmental factors and environmental impact are from the product requirements.

The environmental aspects of the product should be weighed against a number of other factors, such as function, performance, cost, market and quality of the product, as well as legal, regulatory and safety requirements. The standards should be prepared so that the designer of the device or system can achieve a trade-off that promotes the protection of the environment while meeting the standard objectives.

3.2 Impact of the provisions of product standard on environment

The provisions in the product standards have more or less contact with product life cycle in the environmental factors, as shown in Figure 1. In this way, product standards can effectively promote the continuous improvement of product environmental factors.

The purpose of this article is to provide the standard compilers with background information on matters they need to consider when considering the introduction of environmental considerations into product standards.

The provisions of the product standards can play a catalytic role or a role in hindering to environmental improvement. Unless there is a significant need (for example, in terms of health, safety, or product performance), the standards should, as far as possible, avoid provisions for material used in the product, but define the expected results. Prescribing materials may hinder the innovation and development of new methods for improving environmental factors through the use of alternative materials. For example, the provisions of the product standards should not prevent the use of appropriate secondary use or recycling of materials. If material is to be specified, consideration should be given to how the use of the specified materials shall affect the environment at all stages of the product life cycle. In general, if product standards are too restrictive, it shall unexpectedly prevent innovation and environmental improvement.

- Innovation is quite rapid. Therefore, when changes based on new knowledge may significantly improve the environmental aspects of the product, consideration should be given to reviewing product standards.
- The intended use and reasonably foreseeable misuse of a product determines to some extent its environmental aspects. Both of these factors should be considered.
- In general, compared to the provisions of product design requirements, the requirements for product performance requirements should be placed in a more important position, for example, more concerned about product features rather than the design of the provisions.

different products. Not all products will necessarily have the same impact on the environment at all stages of their life cycle.

As the environmental factors between products are usually interrelated, if it is too arbitrary to emphasize an environmental factor, it may cause adverse effects on other environmental factors at other stages of the product life cycle, or elsewhere in the local, regional or global environment.

3.3 Environmental strategy

When compiling product standards, strategies and techniques to improve the environment can be seen in four areas: resource conservation, energy conservation, pollution prevention and waste avoidance. All environmental improvement strategies should be incorporated into the design of environmental awareness projects.

It is recommended that standard writers consider the following aspects:

- resource conservation

In addition to resource obtainment and resource use and environmental impact, the resource consumption is also very important. Resource consumption refers to the process of reducing of the storage of natural resources. Standard writers can make goal as: under possible conditions, to create demand so as to promote minimization of resource consumption (for example, the reduction of resource consumption is achieved by reducing the volume and quality).

- energy saving

Three factors to be considered in energy conservation are: the environmental impact of various energy sources, the conversion efficiency of energy use and the efficient use of energy. There may be a need for a sustainable environmental trade-off between the various energies, especially for long-life electrical and electronic products, particular attention needs to be paid to energy efficiency at the use stage as an important issue.

Energy management can be considered in the following cases:

- production of raw material;
- production of parts and components from materials;
- product assembling by parts and components;
- use of safe and satisfactory method to make products meet functional and performance requirements;

shall enable the designer to develop products with superior environmental factors. The inputs and outputs are related to each other. Changing any input, regardless of the material and energy used, can affect other inputs and outputs (see Figure 1).

Refer to Annex A for a list of environmental factors considered in the product standards.

4.2 Input

4.2.1 Input can be divided into two major categories of material input and energy input. Standards writers should consider the following aspects to ensure that their requirements shall enable designers to develop products with the least negative environmental impact using environmentally conscious design methods.

4.2.2 Material inputs at different stages of the product life cycle can have a variety of environmental impacts. These different stages refer to the acquisition, production, transportation (including packaging and storage) of raw materials, use/maintenance, reuse/recycling and disposal of the product. These environmental impacts include the consumption of renewable and non-renewable energy sources, the damaging use of land, causing exposure of the environment or human body to hazardous substances. Material inputs also contribute to waste generation, increase emissions into the air, pollute water quality and generate other pollutants.

4.2.3 Most of the product life cycle requires energy input. These energies can be entered either directly or indirectly, for example, energy input during material processing. Sources of energy include fossil fuels, nuclear energy, potentially recoverable waste, hydro, geothermal, solar and wind energy.

4.3 Output

4.3.1 Outputs generated during the product life cycle include the product itself, intermediates and by-products, air emissions, effluent discharge, waste materials and other emissions. Standard writers should consider the following areas to ensure that the written requirements enable designers to use environmental conscious design methods to develop products with the least negative environmental impact.

4.3.2 Air emissions include gases, vapors, or particulates that are released into the atmosphere. Emissions that are toxic, corrosive, flammable, explosive, acidic or odorous may have adverse effects on plants, animals, humans, buildings, etc. or aggravate other environmental impacts, for example, reducing the amount of ozone in the stratosphere or forming smoke. Air emissions not only have point source discharge, but also diffuse source emissions; not only emissions after treatment, but also emissions without treatment; not only

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