GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

ICS 13.020.20

Z 04

GB/T 32161-2015

General principles for eco-design product assessment

生态设计产品评价通则

Issued on: October 13, 2015 **Implemented on: May 01, 2016**

Issued by: General Administration of Quality Supervision, Inspection and Quarantine;

Standardization Administration of PRC.

Table of Contents

Foreword 3
1 Scope 4
2 Normative references 4
3 Terms and definitions 5
4 Assessment principles and methods 6
4.1 Assessment principles 6
4.2 Assessment methods and processes 7
5 Assessment requirements 8
5.1 Basic requirements 8
5.2 Assessment index requirements 9
6 Preparation method of life cycle assessment report 11
6.1 Preparation basis 11
6.2 Report content framework 11
Appendix A (Normative) Content framework of eco-design product assessment specifications 13
Appendix B (Normative) Methodological framework for life cycle assessment of industrial products 14
Appendix C (Informative) Example of data collection form 23
Appendix D (Informative) Priority ranking methods and examples of improvement program of product eco-design 26
References 30

General principles for eco-design product assessment

1 Scope

This standard specifies the terms and definitions, assessment principles and methods, assessment requirements, methods for preparing life cycle assessment reports of eco-design product assessment.

This standard applies to the compilation of specifications of specific eco-design product assessment.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

GB/T 7635.1 National central product classification and codes - Part 1: Transportable product

GB17167 General principle for equipping and managing of the measuring instrument of energy in organization of energy using

GB/T 19001 Quality management systems - Requirements

GB/T 23331 Energy management systems - Requirements

GB/T 24001 Environmental management systems - Requirements with guidance for use

GB/T 24040 Environmental management - Life cycle assessment - Principles and frameworks

GB/T 24044 Environmental management - Life cycle assessment - Requirements and guidelines

GB/T 28001 Occupational health and safety management systems - Requirements

3.6

Background data

Product's lifecycle data obtained from sources other than direct measurements.

3.7

Report for life cycle assessment

A report prepared based on the life cycle assessment method for disclosing the eco-design of the product and the full life cycle environmental impact information.

4 Assessment principles and methods

4.1 Assessment principles

4.1.1 Principle of combining life cycle assessment and index assessment

According to the life cycle assessment method, consider the whole life cycle of industrial products, from the stages of product design, raw material acquisition, product production, product use, post-disposal recycling, etc., to in-depth analyze the resource consumption, ecological environment, human health impact factors at each stage, to select evaluable indicators at different stages to constitute an assessment index system. Different types of products shall establish different eco-design assessment index systems, as the access conditions for evaluating and screening eco-design products. On the basis of meeting the assessment index requirements, use a life cycle assessment method to carry out a life cycle inventory analysis, conduct a life cycle impact assessment, compile a life cycle assessment report, which serves as a necessary condition for evaluating eco-design products.

4.1.2 Principles for optimal selection of environmental impact types

In order to reduce the difficulty of life cycle assessment, according to the characteristics of the product, it should select the types of environmental impacts with high impact, high social attention, clear requirements of national laws or policies. Usually, they can be selected in climate change, ozone layer destruction, water body ecological toxicity, human body toxicity-cancer effect, human toxicity-non-cancer effect, respirable particulate matter, ionizing radiation-human health effect, photochemical ozone generation potential, acidification, eutrophication-terrestrial, eutrophication-water body, water consumption, minerals and fossils energy consumption, land use change and

meet the national and local total pollutant discharge control targets;

f) Environmental management of production enterprises shall establish and operate environmental management systems, energy management systems, quality management systems and occupational health and safety management systems in accordance with GB/T 24001, GB/T 23331, GB/T 19001, GB/T 28001, respectively;

g) Production enterprises shall be equipped with energy measuring instruments in accordance with GB 17167 and shall be equipped with pollutant detection and online monitoring equipment in accordance with environmental laws and regulations and standards.

5.2 Assessment index requirements

5.2.1 Composition of assessment index

The indicator system can be composed of primary indicators and secondary indicators. The primary indicators should include resource attribute indicators, energy attribute indicators, environmental attribute indicators, product attribute indicators. The secondary indicators shall indicate the stages of the life cycle, that is, the stages of product design, raw material acquisition, product production, product use, post-disposal recycling. See Appendix A for examples of assessment indicators.

5.2.2 Index selection

5.2.2.1 Resource attribute indicators

The resource attributes focus on indicators such as the control of toxic and hazardous substances in raw materials (components), the use of recycled materials, the identification of components that are easy to recycle, the packaging materials and recycling at the production stage, the water consumption in the production stage. Resource attribute indicators may include, but are not limited to:

a) For the use of raw materials (components) containing toxic and hazardous substances, it shall propose the indicators for prohibiting or limiting the use of toxic and hazardous substances;

b) Regarding the use of recycled materials, it shall propose the indicators such as the proportion of recycled materials;

c) For the identification of parts that are easy to recycle, it shall require identifying the material categories of product parts to facilitate recycling;

The calculation method or detection method of each index shall be given in the appendix in the developed standards. The judgment basis shall be given in the assessment index requirement form, see Table A.1.

6 Preparation method of life cycle assessment report

6.1 Preparation basis

The product life cycle assessment methodology shall be established in accordance with the industrial product life cycle assessment method framework in Appendix B; meanwhile a life cycle assessment report shall be prepared based on this methodology.

6.2 Report content framework

6.2.1 Basic information

The report shall provide basic information such as report information, applicant information, assessment object information, standard information used, etc. Among them, the report information includes the report number, compiler, reviewer, release date, etc.; the applicant information includes the company's full name, organization code, address, contact person, contact information, etc.; the assessment object information includes product model / type, main technical parameters , manufacturer and factory site, etc.; the standard information used shall include the standard name and standard number.

6.2.2 Compliance assessment

The report shall provide compliance with the basic requirements and assessment index requirements; provide an explanation of the improvement of all assessment indicators in the reporting period compared to the base period. The reporting period is the current assessment year, which generally refers to the year before the year in which the product participated in the assessment; the base period is a comparison year, which is generally one year earlier than the reporting period.

6.2.3 Life cycle assessment

6.2.3.1 Assessment objects and tools

The report shall describe the objects of assessment, functional units, main functions of the product in detail; provide the material composition of the product and the main technical parameter table; draw and explain the system boundary of the product; disclose the life cycle assessment tools used based on Chinese

Appendix B

(Normative)

Methodological framework for life cycle assessment of industrial products

B.1 Overview

Based on GB/T 24040 and GB/T 24044, establish a life cycle assessment methodology for each type of product. Products should be classified with reference to GB/T 7635.1.

The life cycle assessment process shall include purpose and scope determination, inventory analysis, impact assessment, interpretation and reporting. The details are as follows:

a) Determination of purpose and scope: Study to determine the purpose of the assessment; determine the assessment object and functional unit; define the system boundary and time boundary; define the impact types, necessary elements and optional elements; propose data and quality requirements; give an assessment report form.

b) Inventory analysis: Mainly include data collection preparation, data collection, data confirmation, association of data and unit process, association of data and functional unit, inventory calculation method, data consolidation, data distribution, etc.

c) Impact assessment: Select impact types, type parameters, characterization models; divide the life cycle inventory data into the selected impact types; calculate the type characterization value.

d) Interpretation and reporting: Comprehensively consider inventory analysis and impact assessment; check the completeness, sensitivity, consistency uncertainty of the assessment results; explain the conclusions, recommendations and limitations; prepare a product life cycle assessment report.

B.2 Scoping

B.2.1 General

The assessment scope shall be determined according to the assessment purpose to ensure that the two are compatible. In some cases, the scope of the assessment may be adjusted, but a written explanation of the content and reason for the adjustment is required.

equipment for each process, personnel and living facilities in the plant area are ignored;

g) The selection principle does not apply to toxic and hazardous substances. Any toxic and hazardous materials and substances shall be included in the list.

B.3 Life cycle inventory analysis

B.3.1 General

An inventory of all materials / energy inputs and discharges to air, water and soil within the boundaries of the product system shall be prepared as the basis for product life cycle assessment.

All calculation procedures and calculation formulas shall be given in writing; the assumptions made shall be clearly stated. When the data collection is completed, the collected data shall be reviewed. Then, determine the basic flow of each unit process; calculate the quantitative input and output of the unit process accordingly. After that, the input and output data of each unit process is divided by the output of the product, to obtain the resource consumption and environmental emissions of the function unit. Finally, sum up the data of the same influencing factors in the process of each unit of the product, to obtain the total amount of the influencing factors and provide the necessary data for product-level impact assessment.

A data management plan is an effective tool for managing data and tracking the inventory process of product data. A data management plan may include:

a) A description of the data collection procedures;

b) Data sources;

c) Calculation methods;

d) Data transmission, storage and backup procedures;

e) Quality control and review procedures for data collection, input and processing activities, data files and emissions calculations.

B.3.2 Data collection

B.3.2.1 Overview

Data from the following stages shall be included in the data list:

a) Raw material procurement and pre-processing;

b) Production;

b) Pre-processing of all materials, such as coal washing, etc.;

c) Conversion of recovered materials;

d) Photosynthesis of biological materials;

e) Planting and harvesting of trees or crops;

f) Transport within the extraction or pre-processing facilities or between pre-processing facilities.

B.3.2.4.2 Production stage

This stage begins when the product components enter the production site and ends when the finished product leaves the production facility. Examples of production activities include chemical processing, manufacturing, transportation of semi-finished products during manufacturing, assembly of parts, packaging, etc.

B.3.2.4.3 Product distribution and storage stage

This stage is the process of product transfer and storage from the production plant to the consumer. Examples include energy input for warehouse lighting and heating, refrigerant use in warehouses and transportation vehicles, fuel use for vehicles, and so on.

The transport parameters that shall be considered include the mode of transport, vehicle type, fuel consumption, loading rate, back empty quantity, transport distance.

Transport parameters that should be considered include transport infrastructure, cranes, transport aircraft, other resources and tools.

B.3.2.4.4 Use stage

This stage begins when the product is owned by the consumer or end user and ends when the product used is discarded and shipped to a recycling or waste disposal facility. Examples include usage / consumption model, location, time, assumed period of product use stage, resource consumption during use, product repair and maintenance during use.

B.3.2.4.5 Recovery and processing stage

This stage begins when the user discards the used product and ends when the product returns to nature as waste or enters the life cycle of another product. Examples include collecting and transporting end-of-life products and packaging, removing components, sorting, converting to recycled materials, composting, landfilling, incineration, and so on.

B.4.1 Overview

According to the inventory consumption data and various emission data provided by the inventory analysis, the potential environmental impact of the product system is evaluated, to provide necessary information for the life cycle interpretation.

According to GB/T 24040, life cycle impact assessment is divided into necessary elements and optional elements. The necessary elements include impact types, type parameters, characterization models; classification and division of the inventory analysis results into corresponding impact types; calculation (characterization) of the type parameter results. This standard does not involve optional elements because normalization and weighting calculations are not required for type parameter results.

B.4.2 Selection of impact type

Impact types can be divided into three categories: resource consumption, ecological and environmental impacts; human health hazards. Among them, resource consumption may include water resource consumption, mineral and fossil energy consumption; the types of ecological and environmental impacts may be selected from climate change, acidification, eutrophication-terrestrial, eutrophication-water bodies, photochemical ozone generation potential, ozone layer destruction, water body ecology toxicity, utilization of land use; human health hazards may include human toxicity-cancer effects, human toxicity-non-cancer effects, inhalable particulate matter, ionizing radiation-human health effects.

B.4.3 Data classification

According to the physical and chemical properties of the inventory factors, the factors that contribute to a certain type of influence are grouped together. For example, the inventory factors such as carbon dioxide, methane, nitrous oxide, perfluorocarbons that contribute to climate change are classified into the types of climate change impacts.

B.4.4 Classification assessment

It shall give characteristic models of different impact types, as well as the origin of the models. The results of classification assessment are expressed by the material equivalents in Table B.1.

the impact of the method choices such as system boundaries, data sources, allocation choices, types of life cycle, etc., on the results.

Tools that should be used to evaluate the robustness of a product life cycle model include:

a) Integrity inspection: Evaluate the data list to ensure its completeness relative to the identified goals, scope, system boundaries and quality criteria. This includes the completeness of the process scope (i.e., encompassing all processes of each supply chain stage under consideration) and the input / output scope (i.e., including all material or energy inputs and emissions associated with each process).

b) Sensitivity inspection: Evaluate the reliability of final results and conclusions by determining how they are affected by uncertainties in data, allocation methods, or type parameters.

c) Consistency inspection: The purpose of the consistency inspection is to confirm whether assumptions, methods and data are consistent with the requirements and scope requirements.

B.5.3 Identification of hot issues and determination of improvement plans

In order to generate environmental benefits or at least minimize environmental responsibility, it shall, based on the information in the inventory analysis and impact assessment stages, propose a series of eco-design improvement plans related to the evaluated products.

The improvement programs proposed by the assessors based on the results of the product life cycle assessment are generally extensive and comprehensive. Not all improvement programs can be implemented. It shall, from the technical feasibility, environmental improvement, economic benefit, impact of customer added value (CVA), production management, etc., assess the improvement program; prioritize them; draw the implementer prioritization diagram and life cycle stage prioritization diagram; see Appendix D for specific methods.

Note: Customer added value is the difference between the value perceived by the customer and the cost incurred. Only when the value of a product is perceived by the customer, can it bring benefits to the enterprise.

B.5.4 Conclusions, recommendations, limitations

It shall state the conclusions, recommendations, limitations in accordance with the objectives and scope of the identified product life cycle assessment. Conclusions should include assessment results, a summary of "hot issues", improvement options.

This is an excerpt of the PDF (Some pages are marked off intentionally)

------ The End ------