TECHNICAL SPECIFICATION

ISO/TS 14048

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Environmental management — Life cycle assessment — Data documentation format

Management environnemental — Analyse du cycle de vie — Format de documentation de données

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committee is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years with a view to deciding whether it should be confirmed for a further three years, revised to become an International Standard, or withdrawn. In the case of a confirmed ISO/PAS or ISO/TS, it is reviewed again after six years at which time it has to be either transformed into an International Standard or withdrawn.

Attention is drawn to the possibility that some of the elements of this Technical Specification may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TS 14048 was prepared by Technical Committee ISO/TC 207, *Environmental management*, Subcommittee SC 5, *Life cycle assessment*.

Annex A forms a normative part of this Technical Specification. Annex B is for information only.

Introduction

This Technical Specification provides a framework and requirements for the unambiguous documentation of Life Cycle Inventory analysis (LCI) data. Following the general framework for Life Cycle Assessment (LCA), laid down in ISO 14040, and the requirements and guidance on LCI, provided in ISO 14041, this specification intends to support a transparent reporting, interpretation and review of data collection, data calculation, data quality and data reporting, as well as facilitating data exchange. This Technical Specification supports LCA use and development, and is aimed primarily for data suppliers, LCA practitioners and LCA information system developers.

The data documentation format facilitates the reporting of LCI data and compliance with the requirements from ISO 14040 and ISO 14041 on data collection, data documentation and data quality. It also facilitates interpretation of LCI data as described in ISO 14043. In addition, the data documentation format allows the documentation and use of important information for Life Cycle Impact Assessment (LCIA), ISO 14042, including environmental information, environment condition and location.

The data documentation format is also intended to facilitate the exchange of LCI data without loss of transparency. This specification does not provide specific requirements for implementation of data exchange. However, the specification allows the flexibility to design different data exchange and data communication formats, as well as software tools that are fully consistent with the data documentation requirements herein.

Although primarily intended for documentation of life cycle data, the data documentation format can also be used for the management of environmental data, e.g. for reporting, performance assessment and benchmarking.

As practice emerges or needs for a broader use of data documentation format arise, the contained format and structure may be expanded to include additional information, such as from environmental performance evaluation, health and safety, and life cycle costing.

This Technical Specification contains a comprehensive list of requirements, rather than a procedural specification. The document specifies how the general documentation requirements for LCI data, as expressed in the ISO 14040 standards, is divided into data fields. Each data field holds text, in some cases selected from a specific nomenclature, or quantitative data. The meaning of each data field is specified in a short descriptive text. The structure of the document itself specifies the relationship between the data fields.

The specification, explanation and implementation of the data documentation format is described in different parts of the document as follows:

— clause 5 covers the specification and structure of the data documentation format and the names of all of the data fields;

— clause 6 covers the specification of the data types used in the data documentation format;

— clause 7 covers the specification of nomenclatures used in the data documentation format;

— annex A contains formatting requirements and explanatory descriptions of each data field to help the user understand which information to place in each data field;

— annex B contains a detailed example of the use of the data documentation format.

Environmental management — Life cycle assessment — Data documentation format

1 Scope

This Technical Specification provides the requirements and a structure for a data documentation format, to be used for transparent and unambiguous documentation and exchange of Life Cycle Assessment (LCA) and Life Cycle Inventory (LCI) data, thus permitting consistent documentation of data, reporting of data collection, data calculation and data quality, by specifying and structuring relevant information.

The data documentation format specifies requirements on division of data documentation into data fields, each with an explanatory description. The description of each data field is further specified by the structure of the data documentation format.

This Technical Specification is applicable to the specification and structuring of questionnaire forms and information systems. However, it can also be applied to other aspects of the management of environmental data.

This Technical Specification does not include requirements on completeness of data documentation. The data documentation format is independent of any software or database platform for implementation.

This Technical Specification does not require any specific sequential, graphic or procedural solutions for the presentation or treatment of data, nor does it describe specific modelling methodologies for LCI and LCA data.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this Technical Specification. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this Technical Specification are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 8601:2000, *Data elements and interchange formats — Information interchange — Representation of dates and times*

ISO 9000:2000, *Quality management systems — Fundamentals and vocabulary*

ISO 14040:1997, *Environmental management — Life cycle assessment — Principles and framework*

ISO 14041:1998, *Environmental management — Life cycle assessment — Goal and scope definition and inventory analysis*

ISO 14042:2000, *Environmental management — Life cycle assessment — Life cycle impact assessment*

ISO 14043:2000, *Environmental management — Life cycle assessment — Life cycle interpretation*

3 Terms and definitions

For the purposes of this Technical Specification, the terms and definitions given in ISO 14040, ISO 14041, ISO 14042 and ISO 14043 and the following apply.

3.1
data source
origin of data

3.2
data type
nature of the data

EXAMPLES Units, quantitative, short string, free text, numerical, logical.

3.3
data field
container for specified data with a specified data type

3.4
data documentation format
structure of documentation of data

NOTE This includes data fields, sets of data fields and their relationship.

3.5
representativeness
qualitative assessment of degree to which the data reflect the true population of interest

NOTE 1 Considerations could include e.g. geographical, time period and technology coverages.

NOTE 2 See ISO 14041:1998, 5.3.6.

3.6
nomenclature
set of rules to name and classify data in a consistent and unique way

3.7
data quality
characteristic of data that bears on their ability to satisfy stated requirements

[ISO 14041:1998]

3.8
unit process
smallest portion of a product system for which data are collected when performing a life cycle assessment

[ISO 14040:1997]

3.9
process
set of interrelated or interacting activities which transforms inputs into outputs

[ISO 9000:2000]

3.10
product system
collection of materially and energetically connected unit processes which performs one or more defined functions

[ISO 14040:1997]

NOTE For the purposes of this Technical Specification, the term “product” used alone includes not only product systems but can also include service systems.

3.11
life cycle
consecutive and interlinked stages of a product system, from raw material acquisition or generation of natural resources to the final disposal

[ISO 14040:1997]

3.12
reference flow
measure of the needed outputs from processes in a given product system required to fulfil the function expressed by the functional unit

[ISO 14041:1998]

3.13
data commissioner
person(s) or organization(s) which commissions the data collection and documentation

3.14
data generator
person(s) or organization(s) responsible for the modelling of the process and the compilation or the updating of the data

3.15
data documentor
person(s) or organization(s) responsible for entering the data into the data documentation format in use

4 Formatting and reporting

4.1 Formatting

The assignment of information into the data fields of a data documentation format is referred to here as formatting. Formatting includes

— interpretation and assessment of the original information in terms of the scope of the data documentation format,

— structuring the original information into the data documentation format,

— entering the structured information into the data fields of the data documentation format.

The following requirements apply to formatting.

— The information shall be entered into the appropriate data fields of the data documentation format.

— The data documentor shall ensure that all data related to the relevant process in the unformatted document that are of environmental importance are adequately transferred and that no bias is generated. Justification and documentation shall be made regarding information that has been neglected or modified.

— Clear distinction shall be made between a zero value and a void (an empty data field).

— Documentation of different processes, updates, etc. shall be characterized by a unique combination of identification number and version number.

4.2 Reporting

The formatting of information about a process into the data documentation format described in this Technical Specification results in a structured document, i.e. a report.

The example provided in annex B may serve as an example for a report. No mention is necessary of data fields with voids.

This Technical Specification does not include requirements on completeness of documentation. This enables the data documentation format to be used to define different types of summary reports, i.e. reports which only include a subset of a full documentation. Such summary reports can serve to inform users of the documented data on the suitability of the respective data set for a given application. If applicable, an indication that a subset of the data documentation format has been used shall be included in the report.

5 Specification of the data documentation format

5.1 General

This clause presents the general organization of the data documentation format, and is meant to be read as a list of separate and detailed requirements.

This clause specifies the division of the data documentation format into distinct data fields. Each data field holds text, in some cases selected from a specific nomenclature, or quantitative data. The interpretation of each data field is specified in a short descriptive text in annex A. The structure of this clause specifies the relationship between the separate data fields. The requirements necessary for electronic implementation are listed in annex A.

An example of the use of the data documentation format is provided in annex B as an example of paper-based data handling.

The corresponding reference number in the tables of the annexes is indicated after each data field presented in this clause, e.g. **Operating conditions** (*1.1.6.5*). In addition, a reference to defined nomenclature as presented in clause 7 is included when applicable, e.g. nomenclature 7.3.

The data documentation format shall consist of three parts, namely:

— one part covering the process, including the process description and inputs and outputs;

— one part covering the modelling and validation;

— one part covering the administrative information.

The data documentation of a process is illustrated in Figure 1.

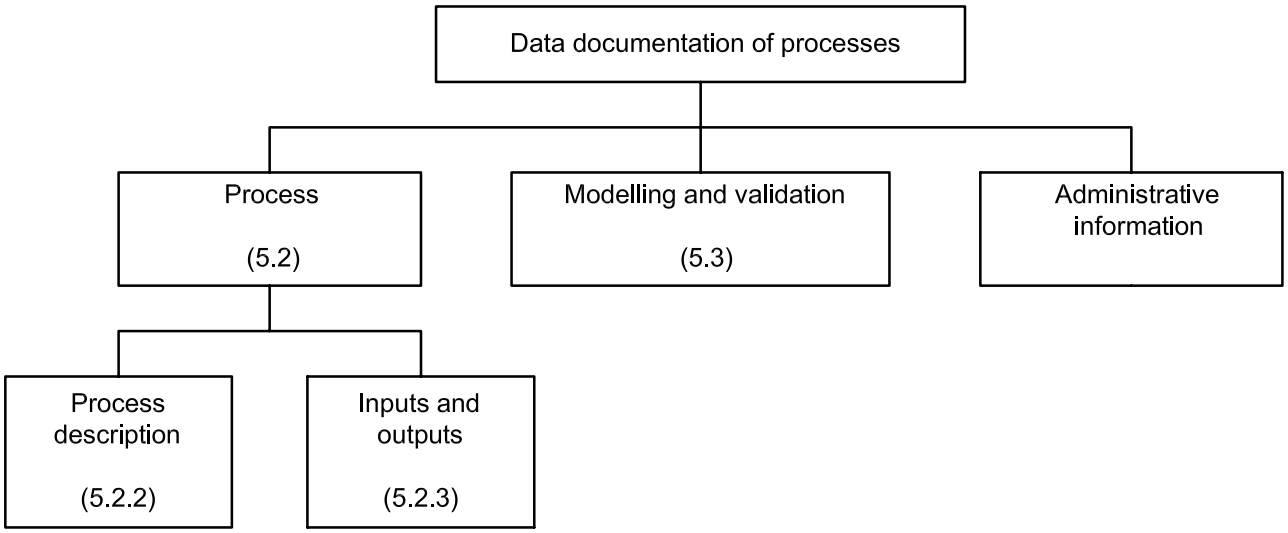

Figure 1 — Concepts of the data documentation format

5.2 Process

5.2.1 General

The set of data fields named process holds data and documentation that describe the properties of the modelled process, including documentation of the technical details and its quantitative parameters, together with a description of the relevant circumstances for which the model is valid.

Process (*1*) shall consist of two parts, namely:

— one set of data fields for the **Process description** (*1.1*);

— unlimited number of sets of data fields for **Inputs and outputs** (*1.2*).

5.2.2 Process description

The process description describes the unit process or a combination of unit processes. It includes the name, function, technical scope, etc.

Examples of processes are:

— a unit process;

— any combination of unit processes;

— technological scenarios, e.g. models of unit processes describing worst-case, best available or future technology.

The process description is independent of the chosen allocation procedures. The allocation procedures are described in the modelling and validation.

The process description shall consist of the following:

a) one data field for the **Name** (*1.1.1*) of the process;

b) unlimited number of sets of data fields for the **Class** (*1.1.2*) of the process expressed by:

   — one data field for the unambiguous **Name** (*1.1.2.1*, nomenclature 7.1 user-defined);

   — one data field for the **Reference to nomenclature** (*1.1.2.2*);

c) one set of data fields for **Quantitative reference** (*1.1.3*) to which all of the data relates, for example the functional unit or reference flow, expressed by:

- one data field for the **Type** (*1.1.3.1*, nomenclature 7.3):
- one data field for the **Name** (*1.1.3.2*);
- one data field for the **Unit** (*1.1.3.3*, nomenclature 7.3);
- one data field for the **Amount** (*1.1.3.4*);

d) one data field for the short description of the **Technical scope** (*1.1.4*, nomenclature 7.3) of the process;

e) one data field for the **Aggregation type** (*1.1.5*, nomenclature 7.2);

f) one set of data fields for **Technology** (*1.1.6*) describing the intended technological applicability of the process, expressed by:

- one data field for the **Short technology descriptor** (*1.1.6.1*);
- one data field for the **Technical content and functionality** (*1.1.6.2*);
- one data field for the **Technology picture** (*1.1.6.3*) (should not be used for the detailed representation of a product system);
- one data field for **Process contents** (*1.1.6.4*) (used when the process is documented as a combination of separately documented processes), expressed by:
  - unlimited number of data fields for the description of **Included processes** (*1.1.6.4.1*);
  - unlimited number of data fields for the **Intermediate product flows** (*1.1.6.4.2*), expressed by:
    I) one data field for the **Source process** (*1.1.6.4.2.1*), from which the intermediate product comes;
    II) one data field for the **Input and output source** *(1.1.6.4.2.2)*, giving the name of intermediate product at the source process;
    III) one data field for the **Input and output destination** *(1.1.6.4.2.3)*, giving the name of the intermediate product at the destination process;
    IV) one data field for the **Destination process** *(1.1.6.4.2.4)*, to which the intermediate product goes;
- one data field for the description of the **Operating conditions** (*1.1.6.5*);
- one set of data fields for **Mathematical model** (*1.1.6.6*), expressed by:
  - unlimited number of data fields for the **Formulae** (*1.1.6.6.1*);
  - unlimited number of data fields for the **Name of variable** (*1.1.6.6.2*);
  - unlimited number of data fields for the **Value of variable** (*1.1.6.6.3*);