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Environmental management for concrete and concrete structures —

Part 8: Environmental labels and declarations

Management environnemental du béton et des structures en béton —

Partie 8: Étiquettes et déclarations environnementales pour le béton

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Contents

Page

Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

ISO/TC 71, *Concrete, reinforced concrete and pre-stressed concrete*, Subcommittee SC 8, *Environmental management for concrete and concrete structures*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

A list of all parts in the ISO 13315 series can be found on the ISO website.

Introduction

The use of concrete in buildings and civil engineering works has a large impact on the environment throughout the life cycle. Therefore, the designers, producers, constructors and users of concrete and concrete structures are increasingly demanding information on the environmental performance of concrete and concrete structures in the form of environmental labels and declarations.

This document comprehensively includes Type I environmental labelling and Type III environmental declarations in one standard in a harmonized way. It is intended to provide the clear and scientifically sound principles and procedures for the environmental labels and declarations for concrete and concrete structures that are consistent with ISO 14020, ISO 14024, ISO 14025 and ISO 21930.

Figure 1 shows the relationship of this document with other International Standards.

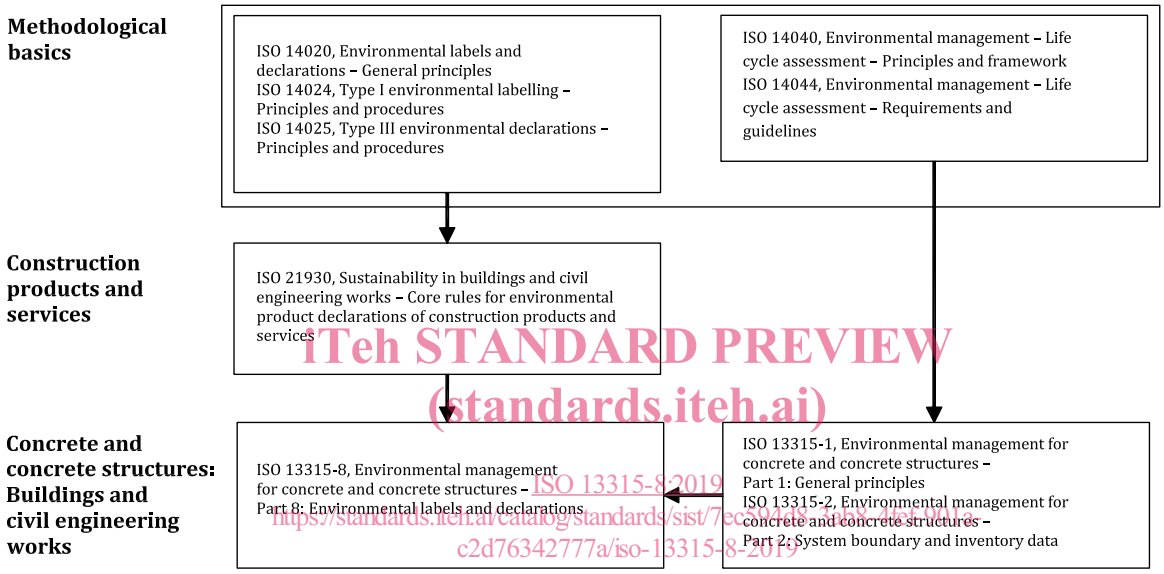

Figure 1 — Relationship of this document with other International Standards

Environmental management for concrete and concrete structures —

Part 8: Environmental labels and declarations

1 Scope

This document provides a general principle, procedures and requirements for environmental labels and declarations for concrete and concrete structures. It is used for the environmental labels and declarations for concrete constituents, reinforcement, concrete, concrete products and concrete structures.

NOTE This document contains more specific requirements for environmental labels and declarations for concrete and concrete structures, based on ISO 14020, ISO 14024, ISO 14025 and ISO 21930.

This document includes the following phases of concrete and concrete structures:

— production phase of concrete constituents, concrete and concrete products;

— execution phase of concrete structures;

— use phase of concrete structures; and

— end-of-life phase.

This document applies to the partial life cycle (certain phases of the life cycle) or the entire life cycle of concrete and concrete structures. It applies to new concrete and concrete structures as well as to existing concrete and concrete structures.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 13315-1:2012, *Environmental management for concrete and concrete structures — Part 1: General principles*

ISO 13315-2, *Environmental management for concrete and concrete structures — Part 2: System boundary and inventory data*

ISO 14020, *Environmental labels and declarations — General principles*

ISO 14024, *Environmental labels and declarations — Type I environmental labelling — Principles and procedures*

ISO 14025, *Environmental labels and declarations — Type III environmental declarations — Principles and procedures*

ISO/TS 14027, *Environmental labels and declarations — Development of product category rules*

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

ISO 14044, *Environmental management — Life cycle assessment — Requirements and guidelines*

ISO 16204, *Durability — Service life design of concrete structures*

ISO 21930, *Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services*

ISO 22965-1, *Concrete — Part 1: Methods of specifying and guidance for the specifier*

ISO 22965-2, *Concrete — Part 2: Specification of constituent materials, production of concrete and compliance of concrete*

ISO 22966, *Execution of concrete structures*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
concrete constituent
material used to produce concrete

Note 1 to entry: The concrete constituents include cement, aggregates, additions, admixtures, water or fibres.

3.2
declared unit
quantity of a construction product for use as a reference unit in an *environmental declaration* (3.3), based on life cycle assessment, for the expression of environmental information needed in *information modules* (3.6)

[SOURCE: ISO 21930:2017, 3.1.11, modified — “EPD” has been changed to “environmental declaration” and “LCA” to “life cycle assessment”.]

3.3
environmental declaration
declaration providing quantified environmental data using predetermined parameters and, where relevant, additional environmental information

[SOURCE: ISO 14025:2006, 3.2, modified — “Type III” has been deleted from the term and “environmental declaration” has been changed to “declaration” in the definition. The Notes to entry have been removed.]

3.4
environmental label
certified label on products indicating overall environmental preferability of a product within a particular product category based on life cycle considerations

[SOURCE: ISO 14024:2018, 3.1, modified — “Type I” and “programme” have been deleted and “labelling” has been changed to “label” from the term. In addition, “voluntary, multiple-criteria-based third party programme that awards a licence which authorizes the use of environmental” has been replaced with “certified” in the definition.]

3.5
functional unit
quantified performance of a product system for concrete and concrete structures for use as a reference unit

[SOURCE: ISO 14040:2006, 3.20, modified — “for concrete and concrete structures” has been added to the definition.]

3.6
information module
compilation of data to be used as a basis for *environmental labels* (3.4) and declarations, covering a unit process or a combination of unit processes that are part of the life cycle of a product

[SOURCE: ISO 14025:2006, 3.13, modified — "a Type III environmental declaration" has been changed to "environmental labels and declaration".]

3.7
precast concrete product
product made of concrete cast and cured in a place other than the final location of use (factory produced or site manufactured)

EXAMPLE The precast concrete product include precast concrete and concrete masonry units.

[SOURCE: ISO 22966:2009, 3.14, modified — "element" has been replaced with "product in the term and "concrete element" has been changed to "product made of concrete" in the definition. An Example has been added and the Note to entry has been deleted.]

3.8
product category rules
PCR
set of specific rules, requirements and guidelines for developing *environmental declarations* (3.3) for one or more product categories

[SOURCE: ISO 14025:2006, 3.5, modified — "Type III" has been deleted.]

3.9
reinforcement
steel or fibre reinforced polymer (FRP) used to reinforce concrete such as reinforcing bars and prestressing or post stressing tendons

3.10
service life
period of time after installation during which a concrete structure or its parts meet or exceed the performance requirements

[SOURCE: ISO 15686-1:2011, 3.25, modified — "facility" has been changed to "concrete structure" and "component" has been deleted.]

4 Symbols and abbreviated terms

Symbol	Description	Unit
E	energy	mega joule or kilowatt hour
m	mass	tonne (metric tonne), kilogram or gram
A	area	square metres
V	volume	cubic metres
AP	acidification potential	—
EP	eutrophication potential	—
GWP	global warming potential	—
LCA	life cycle assessment	—

LCI	life cycle inventory analysis	—
LCIA	life cycle impact assessment	—
ODP	ozone depletion potential	—

5 Objectives

The objectives of this document are to:

— provide environmental information to be used as performance criterion for concrete constituents, reinforcement, concrete, concrete products and concrete structures;

— facilitate communication of the environmental information involved with production of concrete constituents, production of concrete and concrete products, execution of concrete structures, use of concrete structures including operation, maintenance and remedial activities, and end-of-life activities including demolition, reuse/recycling and final disposal;

— enable producers of concrete constituents, concrete and concrete products to reduce the environmental impact of their operations and products; and

— enable designers or constructors to reduce the environmental impact of concrete structures.

6 Common aspects in environmental labels and declarations for concrete and concrete structures

6.1 General

Environmental performances of the concrete constituents, reinforcement, concrete, concrete products and concrete structures shall be evaluated based on respective product environmental criteria for environmental labels or product category rules for environmental declarations. The requirements of ISO 14020, ISO 14024, ISO 14025, ISO/TS 14027, ISO 14040, ISO 14044 and ISO 21930 shall apply.

6.2 Environmental aspect and impact

The use of natural resources and energy, the generation of waste and the release of noise and emissions to air, water and soil shall be considered as environmental aspects directly related to concrete and concrete structures. These environmental aspects related to environmental impacts shall be expressed in terms of environmental impact categories and category indicators, which are listed in ISO 13315-1:2012, 4.3 and category indicators.

NOTE Also, see ISO 21929-1 and ISO/TS 21929-2 for indicators and impacts in buildings and civil engineering works.

Environmental performance of concrete and concrete structures shall be evaluated in labels and declarations in terms of environmental impact categories and category indicators.

6.3 Product categories

A product category for environmental labels and declarations for concrete and concrete structures shall be selected from the primary categories listed in Table 1, which indicates the standard product category on the basis of the same unit.

If necessary, the primary product category should be sub-divided into each class of the product or product group.

Table 1 — Product categories

Product	Primary category	Subcategory
Concrete constituents	Cement	Portland cement
		Blended cement, alkali-activated cement, etc.
	Addition	Fly ash, blast furnace slag, silica fume, etc.
	Admixture	Water reducing/plasticizing admixtures, air entraining admixture, set retarding admixtures, etc.
	Aggregate	Natural aggregate, recycled aggregate, artificial aggregate, etc.
	Water	Tap water, ground water, reclaimed water, etc.
	Others	Fibres, etc.
Reinforcement	Steel reinforcement	Black steel, stainless steel, coated steel, etc.
	FRP reinforcement	FRP bars, FRP sheets, etc.
Concrete	Ready-mixed concrete	
	Others	
Concrete products	Concrete masonry units	
	Precast concrete	
	Others	
Concrete structures	Buildings	
	Civil engineering structures	Road
		Bridge
		Dam
		Tunnel
		Others

NOTE See ISO 12439:2010, A.3 on limitations on the use of water recovered from processes in the concrete industry (or reclaimed water).

6.4 Life cycle phases and information modules

6.4.1 General

Life cycle of concrete and concrete structures shall be divided into three phases:

— production/execution phase (Phase A);

— use phase (Phase B); and

— end-of-life phase (Phase C) as shown in Figure 2.

The production and execution phase shall be further divided into three sub-phases:

— the production of concrete constituents (e.g. cement, additions and admixtures, aggregates and water) and reinforcement (Phase A-1);

— the production of concrete and concrete products (Phase A-2); and

— the execution of concrete structures (Phase A-3).

In addition, Phase D is an optional supplementary information module which can be used to include the potential benefits from reuse and recycling of concrete which is beyond the system boundary of information modules of Phases A, B and C.

NOTE 1 See ISO 13315-1:2012, 4.2 for further explanation of the life-cycle phases of concrete and concrete structures.

NOTE 2 See ISO 21930:2017, 5.2.1 for further explanation of Phase D, which is an optional supplementary information module beyond the system boundary.

Data on environmental aspects and impacts necessary for environmental labels and declarations shall be provided as information modules.

The environmental labels and declarations shall be made based on relevant information modules, but if necessary, with optional information modules.

If the information modules considered in environmental labels and declarations do not cover the phase specified in 6.4.2 to 6.4.6, it shall be stated and the reason for omission shall be clearly explained and justified. In case certain information modules are not relevant to the environmental performance of the product, the relevant module shall be declared as "not relevant."

EXAMPLE A plain concrete pedestal does not include any reinforcement.

Optional information modules not included in the phase specified in 6.4.2 to 6.4.6 may be added if necessary.

EXAMPLE Demountable concrete product is an example where the environmental impact associated with the product includes Phase C in addition to Phase A.

6.4.2 Phase A-1

The environmental labels and declarations for concrete constituents and reinforcement shall be made based on a relevant mandatory information module in Phase A-1.

NOTE The main organization which applies the environmental label and declaration for concrete constituents and reinforcement is the producer.

The environmental labels and declarations for concrete constituents and reinforcement can be given as one aggregated module or three separated modules of resource extraction, transportation of raw materials and production using dashed boxes as shown in Figure 2.

6.4.3 Phase A-1 to Phase A-2

The environmental labels or declarations for concrete and/or concrete products shall be made based on the relevant mandatory information modules in Phase A-1 and Phase A-2.

The environmental labels and declarations for concrete and concrete products can be given as one aggregated module or two separated modules of transportation of concrete constituents and production as shown using dashed boxes in Figure 2.

NOTE The main organization which applies the environmental label and declaration for concrete and/or concrete products is the producer.

6.4.4 Phase A-1 to Phase A-3

The environmental labels and declarations for a concrete structure until the completion of construction shall include all relevant information modules in Phase A-1, Phase A-2 and Phase A-3.

