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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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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.

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.

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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.

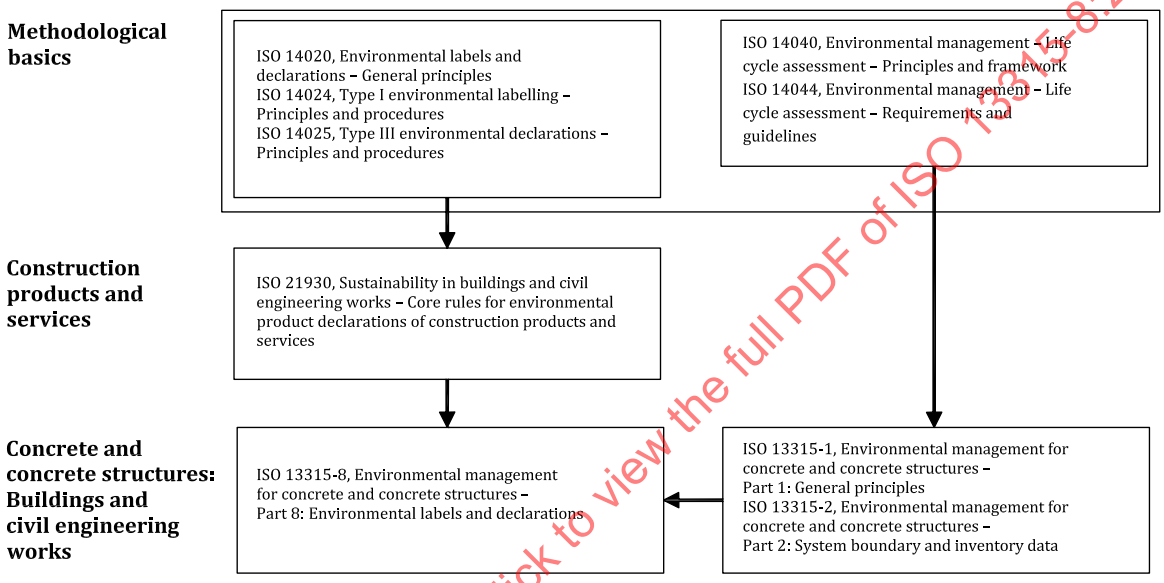


Figure 1 — Relationship of this document with other International Standards

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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*

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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.]

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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	—

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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.

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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).

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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.

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

NOTE The main organization which applies the environmental label and declaration for a concrete structure is the constructor of the concrete structure.

6.4.5 Phase A to Phase B

The environmental labels and declarations for a concrete structure for the entire life except the end-of-life phase shall be made based on all relevant information modules in Phase A-1, Phase A-2, Phase A-3 and Phase B.

NOTE The main organization which applies the environmental declaration for a concrete structure for the entire life except the end-of-life phase is the owner and/or the designer of the concrete structure.

6.4.6 Phase A to Phase C

The environmental labels and declarations for a concrete structure for the entire life cycle shall be made based on all relevant information modules in Phase A-1, Phase A-2, Phase A-3, Phase B and Phase C.

NOTE The main organization which applies the environmental declaration for a concrete structure for the entire life cycle is the owner and/or the designer of the concrete structure.

6.4.7 Specific phase

Environmental labels and declarations can be made in any specific phase or phases.

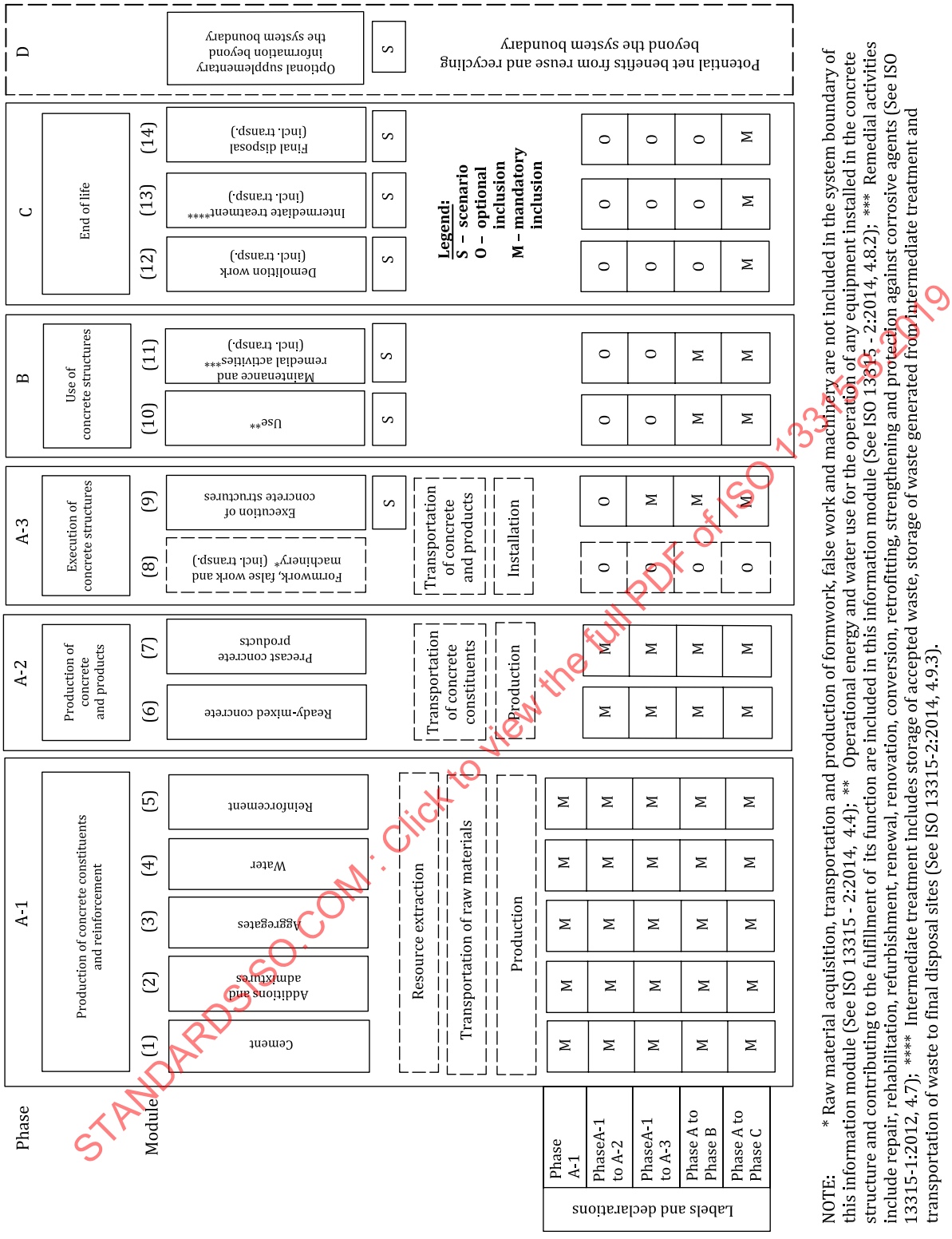
NOTE For example, a concrete producer can include Phase A-2 only for energy efficiency in concrete production.

6.5 System boundary and inventory data

System boundaries shall be set and inventory data shall be calculated or measured appropriately according to ISO 13315-2, ISO 14040 and ISO 14044.

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Figure 2 — Mandatory and optional elements and information modules for concrete constituents, reinforcement, concrete, concrete products and concrete structures

6.6 Service life

Service life of a concrete structure shall be provided by the designer of the structure or determined based on the guidance given in ISO 16204 considering durability aspects of concrete.

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6.7 Scenarios

When needed, scenarios shall be appropriately established for the execution and the use phases of concrete structures and also for the end-of-life phase to evaluate the environmental performance of concrete specific to application as shown in Figure 2. Scenarios shall be used when required by ISO 21930 and shall comply with ISO 21930.

Each scenario shall be clearly explained and justified.

Scenarios for the phase of execution of concrete structures shall include the following:

— the construction method adopted;

— the major construction equipment utilized; and

— the type, amount and transportation distances of major construction materials and construction wastes.

Transportation distances assumed in scenarios shall be set appropriately reflecting the geographical location of the construction site with respect to that of the material and the equipment suppliers.

Scenarios for the use phase of concrete structures shall include the following, while the energy and the resources consumption related to operation of the concrete structure shall be excluded:

— the service life of the concrete structure;

— the major maintenance items and schedule/interval of maintenance and/or remedial activities; and

— the transportation of the materials needed for maintenance and remedial activities.

Scenarios for the end-of-life phase shall include the following:

— the method of demolition of the concrete structure; and

— the amount of the demolished concrete and the reinforcement sent for the intermediate treatment and the final disposal, respectively, as well as the geographical location of the intermediate treatment and final disposal facilities.

Other aspects, which affect the construction method, such as local climate and seasonal variation of climate shall be considered.

NOTE Seasonal variation of climate includes temperature, humidity and solar radiation, etc.

7 Environmental labels for concrete and concrete structures

7.1 General

Environmental labels shall be applied to concrete constituents, reinforcement, concrete, concrete products and concrete structure which shall meet the performance requirements. Concrete shall conform to ISO 22965-1 and ISO 22965-2. Execution of concrete structure shall conform to ISO 22966.

NOTE The performance requirements are provided in the relevant standards. For example, International Standards for natural aggregates and admixtures are ISO 19595 and ISO 19596, respectively.

Environmental labels shall comply with ISO 14020 and ISO 14024.

Environmental labels are applied in principle to Phase A-1 for concrete constituents and reinforcement, and Phase A-1 to Phase A-2 for concrete and concrete products.

Environmental labels may also be applied to Phase A, Phase A to Phase B or to the entire life cycle of concrete structure.

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7.2 Product environmental criteria

7.2.1 General

Concrete constituents, reinforcement, concrete, concrete products and concrete structures which are awarded an environmental label shall meet the product environmental criteria given in product environmental criteria selection tables shown in 7.2.2 to 7.2.6.

7.2.2 Product environmental criteria for concrete constituents and reinforcement (Phase A-1)

Product environmental criteria for concrete constituents and reinforcement shall be in accordance with Table 2, which reflects their environmental aspects and impacts.

Table 2 — Product environmental criteria for concrete constituents and reinforcement

Life cycle		Energy	Resources	Emissions to			Other
Phase	Stage	Renewable/ non-renewable	Biotic/ abiotic	Water	Air	Soil	
A-1	Resource extraction						
	Transportation of raw materials						
	Production						

NOTE The programme operator can select appropriate boxes for the product environmental criteria and modify Table 2 in such a way to better represent environmental aspects of the product. Criteria can be quantitative and/or qualitative. See Annex A for an example product environmental criteria of concrete constituent.

7.2.3 Product environmental criteria for concrete and concrete products (Phase A-1 and A-2)

Product environmental criteria for concrete and concrete products shall be in accordance with Table 3 which reflects their environmental aspects and impacts.

7.2.4 Product environmental criteria for concrete structure (Phase A)

Product environmental criteria for the concrete structure until the completion of construction are shown in Table 4.

7.2.5 Product environmental criteria for concrete structure (Phase A to Phase B)

Product environmental criteria for the concrete structure including the use phase are shown in Table 4.

7.2.6 Product environmental criteria for concrete structure (Phase A to Phase C)

Product environmental criteria for the concrete structure for the entire life cycle are shown in Table 4.

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Table 3 — Product environmental criteria for concrete and concrete products

Life cycle		Energy	Resources	Emissions to			Other
Phase	Stage	Renewable/ non-renewable	Biotic/ abiotic	Water	Air	Soil	
A-1	Resource extraction						
	Transportation of raw materials						
	Production						
A-2	Transportation of concrete constituents						
	Production						

NOTE The programme operator can select appropriate boxes for the product environmental criteria and modify Table 3 in such a way to better represent environmental aspects of concrete and concrete products. Criteria can be quantitative and/or qualitative. See Annex B for an example product environmental criteria of concrete.

Table 4 — Product environmental criteria for concrete structure

Life cycle		Energy	Resources	Emissions to			Other
Phase	Stage	Renewable/ non-renewable	Biotic/ abiotic	Water	Air	Soil	
A-1	Resource extraction						
	Transportation of raw materials						
	Production						
A-2	Transportation of concrete constituents						
	Production						
A-3	Transportation of concrete and concrete products						
	Installation						
B	Use of concrete structures						
C	End of life						

NOTE 1 The programme operator can select appropriate boxes for the product environmental criteria and modify Table 4 in such a way to better represent environmental aspects of the concrete structure. Criteria can be quantitative and/or qualitative. See Annex C for an example product environmental criteria for a concrete structure.

NOTE 2 CO_2 uptake by carbonation during Phases B and C is a beneficial mechanism with which concrete and concrete structures reabsorb part of CO_2 emitted during the production of constituents such as cement. The CO_2 uptake can therefore be considered as a "removal" affecting the global warming potential of concrete and concrete structures.

7.3 Verification

Verification of environmental labels for concrete constituents, reinforcement, concrete, concrete products and concrete structures shall be conducted on the conformity of the product to the performance requirement in the relevant standards and the environmental requirement in this document.

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7.4 Certification for labelling

Certification of environmental labels for concrete constituents, reinforcement, concrete, concrete products and concrete structures shall be conducted in accordance with the procedures given in ISO 14024.

8 Environmental declarations for concrete and concrete structures

8.1 General

The quantified environmental information in an environmental declaration of concrete constituents, reinforcement, concrete, concrete products and concrete structures shall be based on results from one or more life cycle assessment in accordance with the ISO 14040 family of standards.

Environmental declarations shall comply with ISO 14020, ISO 14025 and ISO 21930.

System boundaries shall be set and inventory data shall be calculated or measured appropriately in accordance with ISO 13315-2, ISO 14040 and ISO 14044.

Allocations shall be treated in accordance with ISO 13315-2, ISO 14040 and ISO 14044. The materials and energy flows, as well as associated emissions, shall be allocated to the different products according to clearly stated procedures, which shall be documented.

The cut-off rules for inputs and outputs shall be based on environmental relevance, which can be expressed by mass, energy or other values. A cut-off rule of 1 % (i.e. inclusion of at least 99 % of the total mass of inputs) by mass is recommended for concrete constituents, reinforcement, concrete, concrete products and concrete structures. All hazardous and toxic materials and substances, to which the cut-off rules shall not apply, shall be included in the inventory.

8.2 Declared unit and functional unit

8.2.1 Declared unit

The declared unit of concrete constituents, reinforcement, concrete, concrete products and concrete structures shall be kilogrammes (kg) or cubic metres (m^3).

EXAMPLE The declared unit for ready-mixed concrete is m^3.

8.2.2 Functional unit

The functional unit of concrete constituents, reinforcement, concrete and concrete products shall be kilogrammes (kg) or cubic metres (m^3) considering the following:

— strength;

— durability; and

— purpose of specific application.

EXAMPLE 1 1 ton of coarse aggregate for reinforced concrete.

The functional unit of a concrete structure shall be kg or m^3 in principle considering the following:

— performance;

— service life; and

— specific use of the structure.

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Where necessary, the area (m^2) can be used as the functional unit.

EXAMPLE 2 Functional unit (for a concrete structure) can be 1 m^3 of concrete structure for a medium-rise reinforced concrete office structure.

8.3 Environmental data

8.3.1 General

An environmental declaration shall include the relevant data from LCI, LCIA and/or information modules, which shall be clearly separated into three categories of 8.3.2 to 8.3.4. The relevant data may include, but are not limited to, the environmental impact categories listed in this document.

8.3.2 Data derived from LCI

The environmental data derived from LCI shall be associated with environmental impact categories and units as given in Table 5.

Table 5 — Environmental data derived from LCI

Environmental impact category	Unit
Consumption of resources and renewable primary energy	
— Depletion of non-renewable energy resources	MJ
— Depletion of abiotic fossil resources	MJ
— Depletion of abiotic non fossil resources	kg antimony eq.
— Depletion of biotic resources	by convention
— Use of renewable primary energy	MJ
— Consumption of fresh water	m^3
Emission to air, water and soil	
a) Air pollution	
— SO_x	mg
— NO_x	mg
— Particulate matter	mg
— Dust	mg
— Others	
b) Water pollution	
— Heavy metal	mg
— Others	
c) Soil contamination	
— Heavy metal	mg
— Others	

8.3.3 Data derived from LCIA

The environmental data derived from LCIA shall be associated with environmental impact categories and units as given in Table 6.

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Table 6 — Environmental data derived from LCIA

Environmental impact category	Category indicator	Unit
Global climate change	Global warming potential (GWP)	kg CO_2 eq.
Stratospheric ozone level	Ozone depletion potential (ODP)	kg CFC-11 eq.
Acidification	Acidification potential (AP)	kg SO_2 eq.
Eutrophication	Eutrophication potential (EP)	kg $(PO_4)_3$ eq.
Photochemical ozone creation	Formation potential of tropospheric ozone	kg C_2H_4 eq.
Natural resources use	Abiotic depletion potential for fossil resources	MJ
Fuel (natural fuel, waste material)	Abiotic depletion potential for non-fossil resources	kg antimony eq.
Resources		

NOTE CO_2 uptake by carbonation is a beneficial mechanism with which concrete and concrete structures reabsorb part of CO_2 emitted during the production of constituents such as cement. The CO_2 uptake can therefore be considered for environmental declarations as a "removal" affecting the GWP of concrete and concrete structures.

8.3.4 Other data

The waste generation shall be categorized as hazardous waste and non-hazardous waste as given in Table 7.

Table 7 — Other environmental data

Environmental impact category	Unit
Impacts due to waste generation	
— Hazardous waste generation	kg
— Non-hazardous waste generation	kg

NOTE Waste can come in the form of powder or sludge.

8.3.5 Additional environmental information

An environmental declaration shall include, where relevant, additional information related to environmental issues, other than the environmental information derived from LCI, LCIA or information modules. Identification of the significant environmental aspects should, as a minimum, take into consideration the items shown in Table 8.

Table 8 — Additional environmental information

Environmental impact category	Category indicator	Unit
Pollution due to radioactive substances	Radon	Bq
Noise/vibration	Noise	db
	Vibration	db

8.4 Technical information for scenarios

8.4.1 General

Scenarios and related technical information are necessary for the application of environmental declarations to concrete structures in Phase A-3, Phase B and Phase C.

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8.4.2 Phase A-3

Technical information given in Tables 9 and 10 shall be provided to specify scenarios for the transportation of reinforcement, concrete and concrete products, and the execution of concrete structures, respectively, in Phase A-3.

Table 9 — Technical information for transportation

Parameter	Description/unit
a) Transportation vehicle	Description (type, capacity, etc.)
b) Fuel	Description (type)
c) Fuel consumption	Litre
d) Transportation distance	km
e) Bulk density of transported products	kg/m^3
f) Capacity of transportation vehicle	ton
g) Concrete quantity to be transported	m^3 or kg

Table 10 — Technical information for execution

Parameter	Description/unit
a) Equipment for construction	Description (type, capacity, etc.)
b) Energy consumption	Description (fuel type and fuel consumption rate)
c) Net fresh water use	m^3
d) Other resource use	kg
e) Construction waste generation	kg

8.4.3 Phase B

Technical information given in Table 11 shall be provided to specify scenarios for the maintenance and remedial activities for concrete structures in Phase B.

Table 11 — Technical information for maintenance and remedial activities

Parameter	Description/unit
Maintenance	
a) Maintenance process	Description
b) Maintenance cycle	Number per year × service life
c) Ancillary materials for maintenance	kg
d) Waste resulting from maintenance	kg
e) Net fresh water consumption during maintenance	kg
f) Energy input during maintenance	kWh
Remedial activities	
g) Inspection process	Description
h) Repair process	Description
i) Repair cycle	Number per year × service life
j) Ancillary materials for repair	kg
k) Waste resulting from repair	kg
l) Net fresh water consumption during repair	m^3
m) Energy input during repair	kWh

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8.4.4 Phase C

Technical information given in Table 12 shall be provided to specify scenarios for the demolition work, intermediate treatment and final disposal of concrete structures in Phase C.

Table 12 — Technical information for demolition work, waste generation, treatment and final disposal

Parameter	Description/unit
Demolition work	
a) Demolition equipment	Description (type, capacity, etc.)
b) Energy consumption	Description (fuel type and fuel consumption rate)
c) Net fresh water use	m^3
d) Waste generation	
— Concrete	kg or ton
— Reinforcement	kg or ton
— Others	kg or ton
Waste treatment	
e) Reuse	
— Transportation	Type and capacity of transportation vehicle, transportation distance and fuel consumption
f) Recycle	
— Transportation	Type and capacity of transportation vehicle, transportation distance and fuel consumption, location of intermediate treatment plant
g) Final disposal	
— Transportation	Type and capacity of transportation vehicle, transportation distance and fuel consumption, location of final disposal site
— Method of final disposal	Description for method of final disposal

8.5 Verification

Verification of environmental declarations for concrete constituents, reinforcement, concrete, concrete products and concrete structures shall be conducted.

8.6 Declaration

Environmental declarations for concrete constituents, reinforcement, concrete, concrete products and concrete structures shall include the general information, the scenarios and related technical information and the environmental data. Environmental declarations shall be published in accordance with the procedures given in ISO 14025.

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Annex A
(informative)

Example of product environmental criteria for recycled concrete aggregate

A.1 General

This annex provides product environmental criteria for recycled concrete aggregates made of demolished concrete. The recycled concrete aggregates shall meet criteria for the aggregate quality standard for use in concrete in terms of specific gravity, absorption, abrasion resistance, grading and potential alkali-aggregate reaction of aggregate.

A.2 Product environmental criteria

A.2.1 General

The product environmental criteria for recycled concrete aggregates shall be in accordance with Table A.1, which reflects their environmental aspects and impacts.

Table A.1 — Product environmental criteria for recycled concrete aggregate

Life cycle		Energy	Resources	Emissions to			
Phase	Stage	Renewable/ non-renewable	Biotic/ abiotic	Water	Air	Soil	Other
A-1	Resource extraction		A.2.2	—	—	—	—
	Transportation of raw materials	—	—	—	—	—	—
	Production	A.2.3	—	A.2.4	A.2.4	A.2.4	A.2.4

A.2.2 Resource extraction

It shall use at least 50 % recycled materials using the demolished concrete.

A.2.3 Production

Energy consumption for the production of the recycled concrete aggregates shall be comparable to the production of the crushed aggregates.

Water used for the flotation process to remove foreign substances shall be recycled and reused.

During the wind sorting process used to remove foreign substances, the air scattering of solid materials, such as sand, dust, foreign substance, etc., shall be prevented.

A.2.4 Hazardous substances

The product complies with the criteria for hazardous substances as shown in Table A.2.

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Table A.2 — Criteria for hazardous substances (example)

Item	Criteria mg/kg	Item	Criteria mg/L
Cadmium (Cd)	<0,3	Chromium 6 (Cr6+)	<1,5
Lead (Pb)	<3,0	Arsenic (As)	<1,5
Copper (Cu)	<3,0	Hydrargyrum (Hg)	<0,005

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