# Horizontal guideline for the product performance of construction products in subsequent cycles

Determination and recording of future performance for circular construction

Version 1.0 – 29 June 2023

Platform CB'23

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# Preface

Reuse and recycling play an important role in circular construction. Facilitating reuse and recycling calls for appropriate legislation and regulations. Platform CB'23 explored this topic and formulated recommendations in the 2022 *Leidraad Toekomstig hergebruik faciliteren* (Guide to Facilitating Future Reuse) [1]. One of the findings was that there are few laws and regulations on product performance for reused and recycled products, making it difficult to give guarantees for such products.

Based on the recommendations from its *Leidraad Toekomstig hergebruik faciliteren*, Platform CB'23 published two documents in 2022-2023 that address product performance in subsequent cycles. The *Leidraad Kwaliteitsbeoordeling en -borging bij hergebruik uit bestaande bouw* (Quality assessment and assurance for reuse from existing structures) guide [2] addresses the performance of products from existing structures. The *Horizontal guideline for the product performance of construction products in a subsequent cycle* addresses the performance of new products in subsequent cycles.

This horizontal guideline takes the form of a standard, making the document easier to use as the basis for a Netherlands technical agreement (NTA) or an assessment guideline (Dutch 'beoordelingsrichtlijn' - BRL). It also makes it easier to suggest the document for use in international normative agreements.

This document provides frameworks for agreements on declaring product performance in subsequent cycles for the entire construction sector. Producers can use these frameworks to make agreements on and prepare declarations of performance for their own product groups. This document aims to encourage producers to do so, thus contributing to more reuse and recycling.

**Platform CB'23**

Platform CB'23 (Circular Construction 2023) has committed to drafting agreements on circularity in the construction sector. The platform brings stakeholder parties (including market parties, policy makers and scientists) together to talk to each other and achieve broadly supported agreements. To do so, they work in different action teams. This document was drafted by the *Future Reuse* action team.


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# Horizontal guideline for the product performance of construction products in a subsequent cycle

## 1 Scope

Reuse and recycling play an important role for circular construction. Reuse (at the product level) and recycling (at the materials level) help achieve the three goals of circular construction: protecting stocks of materials, reducing environmental impact and retaining existing value (*Measuring Circularity* guide [3]).

To further encourage reuse and recycling, producers should be able to produce a declaration of performance (DoP) that shows the performance that is important for their product when that product is used again in a subsequent cycle. Producers should be able to prepare such a declaration of performance when they put their product into the market (see figure 1).
The term 'declaration of performance' (DoP) is commonly used in English.

NOTE 1 'Declaration of Performance' is sometimes also phrased more literally as 'to declare performance'.

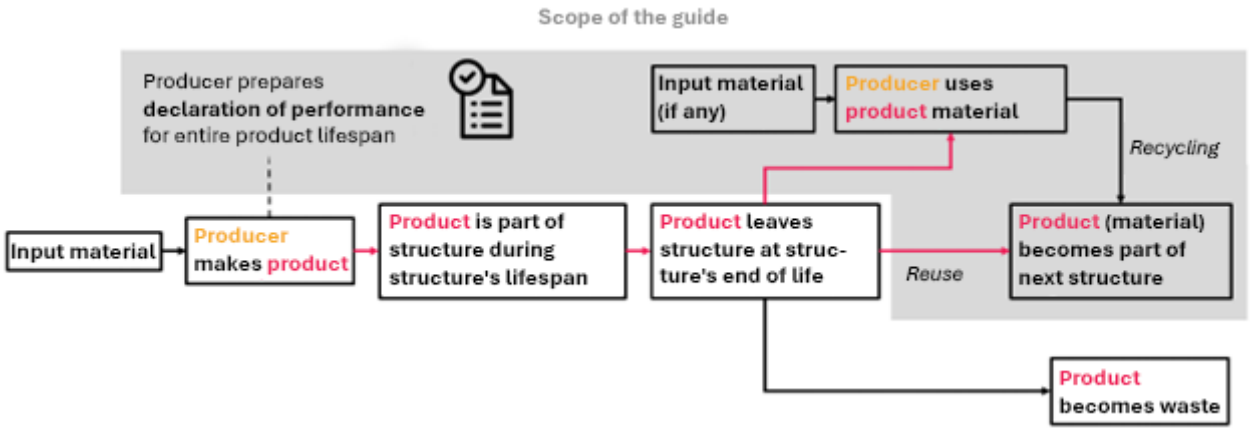



**Figure 1 — Declaration of performance for a subsequent cycle**

Performance of a product in a subsequent cycle is used to indicate whether a product can be fully or partly reused or recycled and if so, what conditions are then applicable. 'Performance' also refers to the properties that can be expected when the product is reused or recycled. Examples of such properties include a product's performance for essential characteristics such as mechanical resistance and stability, fire safety and protection against noise nuisance.

NOTE 2 The Dutch Building Decree 2012 (Bouwbesluit 2012) contains requirements for essential characteristics for structures [4].

If producers can produce a declaration of performance for the subsequent cycle, this will help clients (and producers) make more circular choices. If it is clear what performance can be expected of a product in a subsequent cycle, it will also be possible to make better choices when assessing products in structures in the future. It will then be easier to assess whether a product can be reused or recycled.

Uniform agreements are required to enable declarations of performance to be prepared. These agreements concern what product performance a producer can include in the declaration of performance, when it can be included and what determination method to use. The determination method

can become part of the declaration of performance that manufacturers are already required to prepare when putting a new product into the market. This will also enable producers to take facilitating future reuse and recycling into account during their design process.

NOTE 3 A disassembly manual is an example of an agreement for a producer that wants to include reuse as a performance element of a new product. The manual enables future disassembly and reuse of the product.

At present, there are very few agreements on preparing declarations of performance for the subsequent cycle. Current agreements mostly concern single use (the first cycle). Such agreements are often laid down in European harmonised product standards. Agreements to assess products for reuse are being prepared for some product groups. However, such agreements cannot be applied directly to new products. The method to determine product performance included in such agreements has not been fully harmonised either.

This horizontal guideline is a first attempt by Platform CB'23 to come to unambiguous, harmonised agreements for the declarations of performance of new products in the subsequent cycle.

NOTE 4 The agreements on declarations of performance for products in the subsequent cycle may also be appropriate for products released from existing structures, provided that some modifications will have to be made. For example, rather than using a determination method to determine a product's lifespan, a determination method would be needed to determine the residual lifespan.

This horizontal guideline applies to:

— all products (and product groups) that are put into the market by producers and that become part of a structure;

— products for the buildings and civil and hydraulic engineering sectors;

— products of different types of input materials: primary and secondary materials based on biotic and abiotic raw materials;

NOTE 5 From a circularity perspective, it is preferred that producers produce their products with fewer primary or non-renewable materials and with a lower environmental impact.

— product performance in the subsequent cycle. A product's input flows and product performance during the first cycle are outside the scope;

— product performance for all output flows after the production phase until the product's end of life. Examples of these output flows are construction waste, output due to replacement and output at the end of the lifespan of the structure in which the product was used.

This guideline suggests overarching areas of attention and frameworks for all product groups, just as NEN-EN 15804 does for environmental declarations. Producers of products in specific product groups can use this document to elaborate their own agreements into product standards, guidelines or declarations of quality. They can apply a similar approach as was used for the Product Category Rules (PCRs) for environmental declarations.

This guideline is intended as input for possible national or European harmonisation. Its content is coordinated with the NEN mirror committee for CEN TC350 SC1 'Circular economy in the construction sector'. The guideline may also be suitable as input for the European Construction Products Regulation. The CE marking that is to be applied by producers to most new products in the construction sector is based on this. The European Construction Products Regulation is currently under review. An

information requirement for future reuse is part of this review. This guideline may be useful as input for that part.

## 2 References

NEN-EN 15804, *Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products*

NEN-EN 45557, *General method for assessing the proportion of recycled material content in energy-related products*

NEN-EN-ISO 14021, *Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling)*

BRL 7010, *Hernieuwbare, dan wel gerecyclede content van het KOMO gecertificeerde product*

BRL SVMS-007, *Beoordelingsrichtlijn Veilig en Milieukundig Slopen*

## 3 Terms and definitions

The following terms and definitions apply when using this document.

**3.1**
**abiotic resource**
*raw material* (3.13) generated from non-living resources

Note 1 to entry: Primary abiotic resources are naturally occurring minerals, metals and fossil resources.

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.2**
**waste**
any substance, preparation or object which the holder discards, intends to or is required to discard and which is discharged into the living (or other) environment

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.3**
**biotic resources**
*raw materials* (3.13) derived from living resources, i.e. of plant or animal origin (including algae and bacteria)

Note 1 to entry: Biotic resources are renewable resources.

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.4**
**construction product**
*product* (0) which is supplied to the building site and which is part of an *element* (0) after having been processed

Note 1 to entry: Examples of construction products are bricks, mortar, window panes, switches and central heating boilers.

Note 2 to entry: Where prefabrication is made use of, construction products are already constructed into *elements* (0) before being supplied to the construction site.

[SOURCE: Circular Construction Framework version 1.0.]

**3.5**
**structure**
construction which has been or is to be built, forming one whole and fulfilling a specific function

Note 1 to entry: Examples of structures are a residential building, school, hangar, flyover, broadcasting mast, switching station and railway line.

[SOURCE: Circular Construction Framework version 1.0.]

**3.6**
**circular construction**
development, use and *reuse* (0) of *structures* (0), areas and infrastructure without unnecessarily depleting natural resources, polluting the living environment and affecting ecosystems

Note 1 to entry: Circular construction means construction which is economically justifiable and contributes to the welfare of people and animals, in the Netherlands and abroad, now and in the future.

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.7**
**degradation**
process in which an action or an object causes a deterioration of one or more properties of a *product* (0)

[SOURCE: NPR-ISO/TR 15686-11:2014, 3.1.17]

**3.8**
**disassemblable**
suitable for non-destructive dismantling

Note 1 to entry: A composite *construction product* (0) or *element* (0) can be designed such that it is disassemblable. Preferably, such a *construction product* (0) or *element* (0) is as easy to disassemble as possible.

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.9**
**unit process**
smallest element considered in the *life cycle inventory* (0) quantifying the input and output flows

**3.10**
**EoL treatment / end-of-life treatment**
action involving a *product* (0) that has reached the end of its *functional lifespan* (0) to enable it to either be *reused* as a *construction product* (0) or *material* (0), or to be processed as *waste* (0)

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.11**
**element**
(abstract) part of a structure which is exclusively distinguished on the basis of a required function

Note 1 to entry: Examples of elements are partition, load-bearing structure, lighting, heating and security.

[SOURCE: Circular Construction Framework version 1.0.]

**3.12**
**functional lifespan**
*lifespan* (0) of a *product* (0) during which it remains suitable for its current function and is used at its current location

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.13**
**raw material**
basic material used in a process for making goods, energy, *products* (0) or semi-manufactures

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.14**
**reuse**
reusing structures, *products* (0) or parts or elements of buildings or civil or hydraulic engineering structures in the same function, possibly after they have undergone treatment

Note 1 to entry: Reuse is an *R strategy* (0).

Note 2 to entry: Examples are the reuse of an insulating material as insulating material, a door as a door or a roof as a roof.

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.15**
**life cycle**
consecutive and interlinked stages of a *product* (0) or service system in its current function and location: design, acquisition of raw materials, production, distribution, use and *end-of-life treatment* (0)

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.16**
**life cycle analysis**
**LCA**
method to establish and evaluate the input and output flows, and potential *environmental impact* (0) of a *product system* (0) throughout its *life cycle* (0)

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.17**
**life cycle phase**
phase in the *life cycle* (0) of a *product* (0)

Note 1 to entry: Life cycle phases are those phases which are considered as part of the Determination Method of Stichting NMD. Examples of life cycle phases are the production phase, the construction phase, the use phase and the demolition and processing phase.

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.18**
**life cycle inventory**
**LCI**
phase in a *life cycle analysis* (0) where stock is taken of the nature and quantity of all input and output flows for a *product* (0) throughout its *life cycle* (0)

**3.19**
**lifespan**
functional usage time of a *product* (0)

**3.20**
**detachability**
degree to which a composite *material* (0), *construction product* (0) or *element* (0) can be disassembled non-destructively

Note 1 to entry: Preferably, detachable *construction products* (0) or *elements* (0) can be disassembled as easily as possible.

Note 2 to entry: A synonym for ´detachable´ is ´*disassemblable*´ (0).

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.21**
**material**
processed *raw material* (3.13) that serves for the production of *construction products* (0)

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.22**
**environmental impact**
unfavourable or favourable change in the environment fully or partly resulting from an organisation's activities or *products* (0)

Note 1 to entry: Environmental impact is based on *life cycle analysis* (0) and is described in more detail in Stichting NMD's Determination Method.

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.23**
**maintenance**
action during the use phase of a *construction product* (0) or *structure* (0) to ensure that it remains in a condition which enables it to continue to perform its function as required

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.24**
**output**
*material* (0) from a *product* (0) or *structure* (0) that leaves that *product* (0) or *structure* (0) within or at the end of its *lifecycle* (0)

Note 1 to entry: Output can be reused or recycled, but it can also be lost (by incineration or landfill).

**3.25**
**primary raw material**
*raw material* (3.13) produced by the earth and used by humans

for the production of materials and *products* (0)

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.26**
**primary material**
*construction material or other material* (0) produced from *primary raw materials* (0)

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.27**
**product**
that which is marketed by the supplier and purchased by the buyer for use during the lifetime of a *structure* (0)

[SOURCE: Bepalingsmethode milieuprestatie bouwwerken (Determination method for the environmental performance of structures)]

**3.28**
**product system**
collection of *unit processes* (0) with interventions (emissions and extractions) and product flows fulfilling one or more defined functions and describing the *life cycle* (0) of a *product* (0)

[SOURCE: Bepalingsmethode milieuprestatie bouwwerken]

**3.29**
**recycling**
recovering materials and *resources* (0) from discarded *products* (3.27) and reusing them to make *construction products* (0)

Note 1 to entry: Recycling is an *R strategy* (0).

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.30**
**R strategies**
circular strategies the English names of which all start with the letter R

Note 1 to entry: There are different lists of R strategies, listing 7 to 10 R strategies.

Note 2 to entry: Examples of R strategies are *recycle* (0), *reuse* (0) and *repair* (0).

Note 3 to entry: R principles is sometimes used as a synonym for R strategies.

Note 4 to entry: Strategies for 'closing', 'slowing down' and 'narrowing the loop' are alternative ways to refer to R strategies.

[SOURCE: Platform CB'23 Circular Construction Lexicon]

**3.31**
**scenario**
collection of assumptions and information about an expected sequence of possible future events

[SOURCE: Bepalingsmethode milieuprestatie bouwwerken]

**3.32**
**secondary material**
*material* (0) that replaces *primary materials* (0) or other secondary materials and originates from previous use or from residual flows from another *product system* (0)

[SOURCE: Platform CB'23 Circular Construction Lexicon]

# 4 Abbreviations

| | |
|---|---|
| BRL | Beoordelingsrichtlijn (Dutch assessment guideline) |
| B&U | Dutch abbreviation for sustainable construction sector |
| CE | Conformité Européenne |
| CPR | Construction Product Regulation |
| DoP | Declaration of Performance |
| GWW | Dutch abbreviation for sustainable infrastructure |
| LCA | life cycle analysis |
| LCI | life cycle inventory analysis |
| ECI | environmental cost indicator |
| MPG | Dutch acronym for MilieuPrestatie Gebouwen (Environmental Performance of Buildings) |
| NMD | Dutch acronym for Nationale Milieudatabase (National Environmental Database) |
| NTA | Netherlands Technical Agreement |
| ISO | International Organization for Standardization |

# 5 Product performance

## 5.1 Introduction

This guide focuses on declarations of performance for new products in the subsequent cycle. Product performance refers to the following:

— the scenario for the product in the subsequent cycle, i.e. whether a product is reusable or recyclable and if so, to what extent and in which application (see 5.3);

— the characteristics of the product in that scenario. These characteristics include essential characteristics from the Dutch Building Decree 2012 [4] such as mechanical resistance and stability, fire safety and protection against noise nuisance.

Producers can include conditions for both types of product performance in the declaration of performance.

NOTE 1 An example of a condition under which reuse is possible is that a product is not exposed to salt water.

This chapter describes the possible types of performance that can be included in a declaration of performance and how to determine what performance should be included. Chapter 6 describes the factors that can influence performance and therefore play a role in substantiating the performance.

In practice, the following process is used to prepare the declaration of performance (see Figure 2):

1) determine the output flows that are relevant for the product (see 5.2);

2) determine the scenario for those output flows (see 5.3) and substantiate this scenario;

3) determine the qualitative characteristics that are relevant in the scenario (see 5.4);

4) determine the quantitative performance for these characteristics (see 5.5) and substantiate it.

NOTE 2 An example of this process is determining that only output flows will be relevant at the end of the lifecycle (1) of a product that is put to standard use and is disassembled properly, that the scenario for those output flows in the subsequent cycle is reuse in a similar application (2), that fire safety is a relevant characteristic in that scenario (3), and that the performance of the product when reused is 60 min of fire resistance until failure (4).

The scenario (2) and the performance for the characteristics (4) are the actual product performance. In practice, determining this performance and substantiating it (see chapter 6) is an iterative process with two components (see Figure 2):

— determine the performance and then substantiate it with the factors that influence the performance;

— analyse the factors that influence the performance and use this to determine the performance.

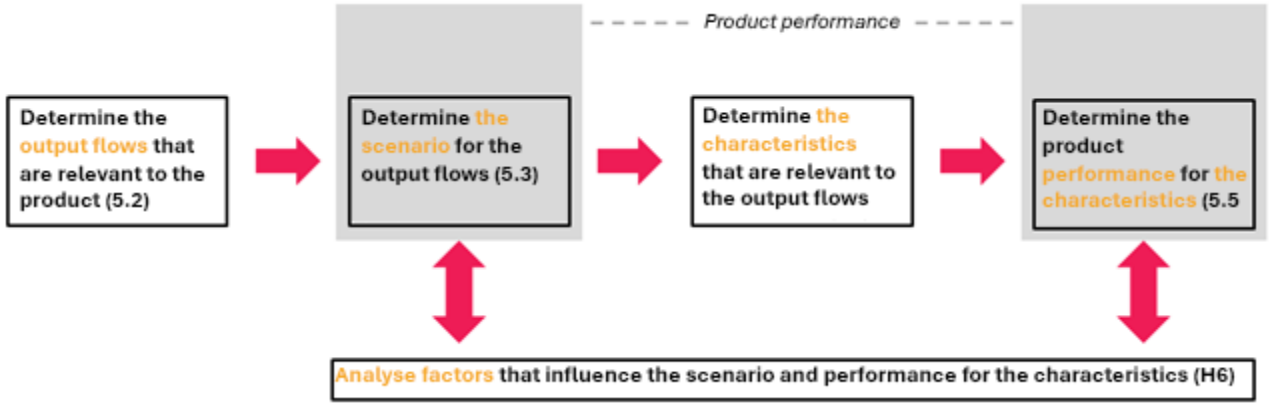



**Figure 2 — Process for preparing a declaration of performance**

The product's performance for the characteristics can play a role when substantiating the scenario. If, after the end of its first lifespan, a product has a limited residual lifespan, for example as regards performance for relevant characteristics, or fails to meet safety requirements in the chain, the reuse scenario cannot be substantiated.

## 5.2 Output flows

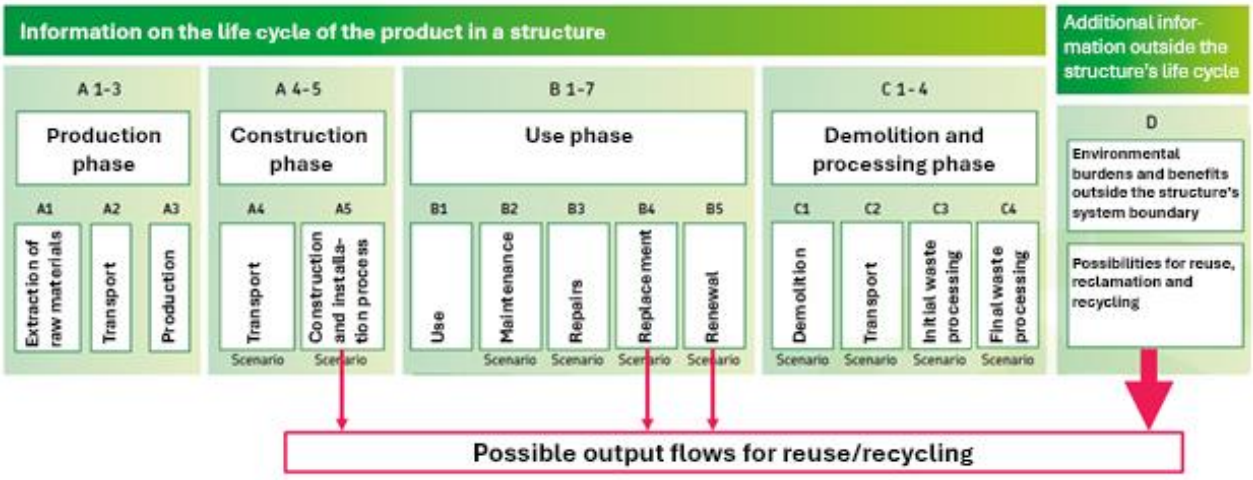
The first step when preparing a declaration of performance is to determine the output flows that are relevant for a product. When determining this, consider output flows in all life cycle stages after the production phase. This specifically concerns the following output flows (see Figure 3):

— construction waste during the construction phase (A5);

— output due to replacements (B4) or renewals (B5) during the use phase;

— output at the end of the lifespan of the structure in which the product was applied (module D).

NOTE In practice, the output at the end of the lifespan of the structure in which the product was applied is usually the largest and most important output flow.




SOURCE: Stichting Nationale Milieudatabase 2022 [5], edited by Platform CB'23

**Figure 3 — Possible output flows for reuse and recycling**

Output from all these life cycle phases can be reused or recycled. If reuse or recycling is possible, this becomes part of the declaration of performance.

## 5.3 Scenario for the subsequent cycle

The second step when preparing a declaration of performance is to determine the scenario for the subsequent cycle for each output flow. Possible scenarios are:

— full reusability in a similar application in a structure;

— full reusability in another application;

— partial reuse in a similar or different application;

— recycling or high-value recycling as a material or high-value raw material, both mechanically and chemically.

NOTE 1 The first two scenarios are preferred from a circularity perspective. If a product can no longer be reused (e.g. after several cycles), then recycling, or high-quality recycling, is also an option.

NOTE 2 The R strategies can be used to classify the different scenarios.

Output flows that are lost to a subsequent cycle are not included in the declaration of performance and are not substantiated. Such a scenario is undesirable from a circular construction perspective.

## 5.4 Relevant characteristics

The third step when preparing a declaration of performance is to determine which qualitative characteristics in the scenario for an output flow are relevant to the product. Which characteristics are relevant varies from product to product, except for environmental impact. Environmental impact is important for all products and must always be included in a declaration of performance in a subsequent cycle.

As a minimum, which of the essential features from the Dutch Building Decree 2012 [4] are relevant must be mapped. These essential characteristics are:

— mechanical resistance and stability;

— fire safety;

— hygiene, health and the environment;

— safety and accessibility during use;

— protection against noise nuisance;

— energy savings and heat retention;

— sustainable use of natural resources.

Always add lifespan to the relevant essential characteristics. Lifespan must always be included in a declaration of performance.

NOTE Specific characteristics relevant to products made of the four most commonly used structural materials (concrete, steel, masonry and wood) can be derived from the reuse parameters in the *Leidraad Kwaliteitsbeoordeling en -borging bij hergebruik uit bestaande bouw* guide [6].

## 5.5 Performance for relevant characteristics

The fourth step when preparing a declaration of performance is to determine the quantitative performance of a product for the relevant characteristics. The quantitative performance can be expressed in several ways:

— meets the safety requirements in the chain and the legislation and regulations for the scenario chosen;

NOTE 1 If a product does not meet the safety requirements in the chain and fails to meet the legislation and regulations, the scenario in question will not be included in the declaration of performance for the subsequent cycle.

— a performance category;

— a value;

NOTE 2 An example of a value is a 60-min fire resistance before the product fails.

— a determination method for performance at the end of the first cycle.

NOTE 3 An example of a determination method for performance at the end of the first cycle is a determination method for the residual lifespan.

# 6 Factors that influence product performance

## 6.1 Introduction

Product performance in the subsequent cycle consists of two elements (see 5.3):

— the scenario of all output flows in the subsequent cycle;

— performance for relevant characteristics in that scenario.

When preparing the declaration of performance, performance for both elements must be substantiated. This chapter describes the factors that can influence performance and therefore play a role in substantiating the performance in the declaration of performance.

## 6.2 The environment

Environmental impact must always be part of the justification of the scenario (5.3). A scenario that has an unfavourable environmental impact must not be included in the declaration of performance. For example: a producer is not allowed to declare reuse as a scenario if it turns out that this does not lower the environmental impact.

The environment itself is an essential characteristic the qualitative performance for which must be included in the declaration of performance.

Calculate environmental impact by preparing an LCA (life cycle analysis). Prepare the LCA as follows:

— determine the LCA according to NEN-EN 15804.

— study which possible scenarios (reuse and material recycling) contribute to reducing environmental impact.

NOTE 1 You can find the possible scenarios in modules C and D – end of life.

NOTE 2 Stichting NMD's Determination Method is based on NEN-EN 15804.

NOTE 3 Stichting NMD's Determination Method is laid down in Dutch law through the Dutch Building Decree 2012 [4].

NOTE 4 Registration in the Dutch NMD is a way to make the data available to buyers in the Netherlands.

NOTE 5 The information from the LCA can also be used to make an MPG (Environmental Performance of Buildings) or ECI calculation.

## 6.3 Product composition

Since the composition of a product can affect its performance in the subsequent cycle, the following questions must be answered as a minimum requirement:

— Do any material aspects of the product decrease over time?

— Does the product contain waste substances that must be separated based on the Dutch Building Decree 2012 Regulation (Regeling Bouwbesluit 2012) [4]?

— Does the composition of the product make recycling more difficult (see also 6.7)?

## 6.4 Assembly

### 6.4.1 Brand layers

The performance in the subsequent cycle can be influenced by how a product is installed or applied in a structure in the first cycle. Whether this is the case for a specific product is partly determined by the location of a product in a structure. If necessary, use Steward Brand's building layers to analyse the location and its influence (see Figure 4).

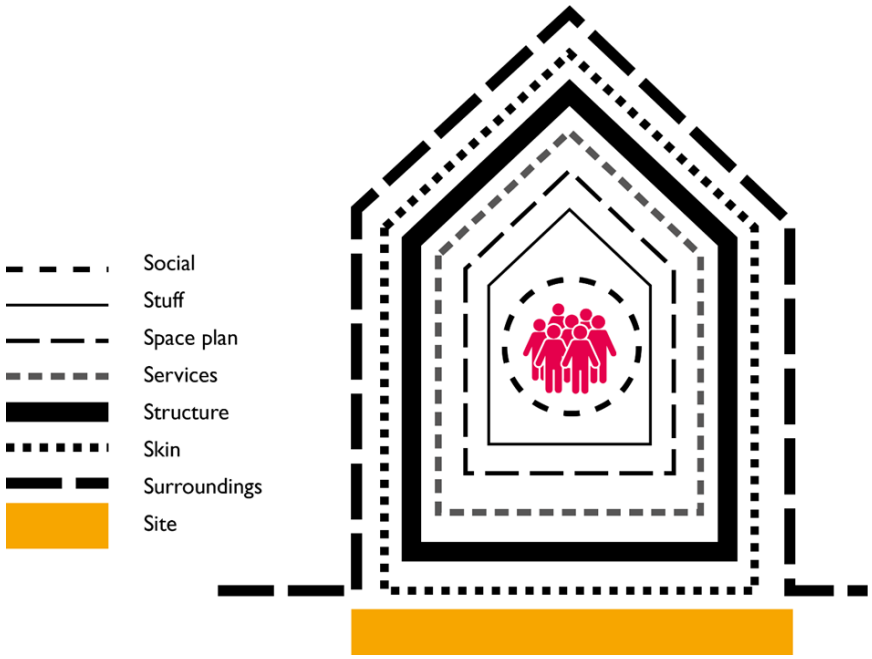



**Figure 4 — Brand's building layers**

The use of Brand's layers originates from the buildings sector where they are used to design and manage buildings, but the principles underlying them are also valid for the civil and hydraulic engineering sector. Each Brand layer has a different lifespan. Designing the layers separately from each other increases a structure's adaptive capacity and makes it easier to maintain, adjust, expand or detach parts of the structure.

**Buildings**

Layers that are distinguished in the building sector include the *space plan*, *services*, such as installations, and the *skin*, such as the façade.

**Civil and hydraulic engineering**

Examples of relevant layers in the civil and hydraulic engineering sector are the surface coarse and the road bed of a motorway. Examples of relevant layers of a bridge are joint transitions and the entire bridge. The outer layer in the civil and hydraulic engineering sector is not the surroundings, but the network (e.g. of roads, waterways or electricity) of which a structure is part. A requirement for networks to function is often that all parts of the network must be functioning. Since this limits the scope for maintenance, repair, replacement and adjustments in layers with shorter lifespans, the network should always be the reference for the analysis in the civil and hydraulic engineering sector.

### 6.4.2 Detachability

Always analyse the following factors to substantiate the scenario chosen:

— Detachability/detachable detailing (see Leidraad Losmaakbaar detailleren (Guide on Detachable Detailing) [7]) and design for disassembly: attachment options and a disassembly manual, non-detachable combinations with other materials and avoiding such combinations;

NOTE Detachability can influence output flows at the end of the lifespan of the structure in which the product is applied, and during the lifespan of the structure, e.g. in case of replacements.

— application factors important for the performance in the subsequent cycle, such as coating layers and glue joints.

## 6.5 Use/maintenance

How a product is used and maintained partly determines its performance in the subsequent cycle. The following factors can play a role in justifying product performance or formulating conditions for its performance:

— influence of the climate, weather and water during the use phase. This can have several effects, including:

  — metal oxidising (e.g. rust in iron compounds);

  — loss of gases if glass is used;

  — degradation of concrete by salt water (penetration, rebar corroding);

  — wood rot at the interface between water and air;

  — degradation of roofing materials by UV light or other light.

— load effects by use;

EXAMPLE 1 Examples of load effects by use are fatigue of steel in a structure exposed to much wind and wear of stone chippings in asphalt.

— emergencies;

EXAMPLE 2 Examples of emergencies are fire, flooding and contamination.

— building physics defects;

EXAMPLE 3 Examples of building physics defects include leakage with consequences elsewhere in the structure and joints not working properly.

  — insufficient maintenance.

EXAMPLE 4 Examples of insufficient maintenance include inadequately maintained painted door or window frames and cracks in the concrete of a bridge structure not being repaired or not being repaired in time.

## 6.6 Removing products and making them suitable for the subsequent cycle

The composition of a product (6.3), including any waste materials to be separated based on the Dutch Building Decree 2012 Regulation [4], and how the product is installed (6.4), which includes its detachability,

can affect how well a product can be removed from a structure and can thus affect product performance in the subsequent cycle. You should also analyse whether the following factors affect the product's performance:

— techniques that can be used to remediate the waste substances to be separated;

— future legislation on waste substances that must be separated;

— how the product can be circularly disassembled and re-installed (see also 6.4) and the instructions required to do so.

NOTE 1 Sections 4.3.2 (on taking stock of substances), 4.3.6 (on demolition) and 4.3.9 (on accounting for substances) of BRL SVMS-007 [8] can help you determine product performance. BRL SVMS-007 is the certification scheme for safe and environmental demolition and is the basis for circular demolition. Certified demolition contractors must comply with this scheme.

NOTE 2 Disassembly/re-installation instructions maximise the probability that a product can be made suitable for reuse.

## 6.7 Application in the subsequent cycle

### 6.7.1 Techniques and possibilities

The techniques available partly determine whether a product can be reused or recycled in a subsequent cycle. To establish this, first consider the existing options and current knowledge. If a product can already be reused or recycled, the burden of proof for the scenario in question is low. The burden of proof for innovative techniques not yet in use is higher.

EXAMPLE The burden of proof for bitumen roofing materials made from recycled bitumen roofing materials is low when declaring recycling as the scenario for the subsequent cycle. This is because recycling of roofing materials is an existing practice.

### 6.7.2 Requirements

The answers to the questions whether a product can be reused or recycled and what performance is required for specific characteristics in the scenario in question depends on the following (and other) requirements:

— material-specific aspects (based on standards for new raw materials and new products (CE marking/DoP));

— safety requirements in the chain;

— legislation and regulations.

Analyse which requirements apply and use them to substantiate product performance.

### 6.7.3 Return system

The answer to the question of whether a product can be reused or recycled also depends on the demand for the product. If there is a return system that makes it plausible that the product will be sold for new intended uses, this fact can be used to substantiate a scenario.

# 7 Data to be delivered for the subsequent cycle

When placing a product on the market, producers must provide several details in the declaration of performance. The purpose of this data is to:

— clarify the product performance and the conditions for the product performance;

— substantiate the product performance;

— ensure that other parties handle the product properly, improving the probability that the product performance aspired to will be achieved.

NOTE 1 Examples of other parties include builders, owners of structures in the use phase and demolition contractors.

Producers must deliver at least the following data:

— the manufacturer;

— the exact product type and year of production, including CE marking, DoP, the product standard and any certification applicable to the product;

NOTE 2 Product type, year of production, etc. are necessary for traceability purposes.

— what output flows there are (5.2) for the product or for parts of the product and what scenario (5.3) can apply to those output flows for the subsequent cycle;

— the lifespan of the product and/or factors that determine its lifespan (in case of reuse);

— the environmental impact (including the $CO_2$ impact) of the scenario for the subsequent cycle, based on the LCA (see 5.3). Include the single-point score and the scores for the individual environmental impact categories, including the contribution to climate change (in kg $CO_2$-eq), in the declaration of performance;

— the composition of the product (see 6.3);

— if relevant for future reuse and recycling: where the materials originate from and how they were produced (see 6.3);

— possibly technical drawings of the product;

— detachable detailing [7]: type of connection, accessibility, edges locked in, intersections (see 6.4);

— instructions for use and maintenance to promote future reuse and/or recycling (see 6.5);

— the mechanisms of degradation, deterioration, loads that affect the potential for reuse and recycling (see 6.5);

— disassembly/re-installation instructions (see 6.6);

— information for the demolition contractor on waste substances to be separated and how to remediate them (see 6.6);

— collection point and conditions;

— preconditions for product performance;

— instructions for possible future recertification;

— instructions for determining the residual lifespan after the first application in a structure.

NOTE 3 This information can also be used for a materials passport [9].

# Annex A
(informative)

# Comparison between CPR and the Horizontal guideline for construction products

It is possible that this horizontal guideline will be used for European harmonisation purposes (see chapter 1), including the CPR. The CPR is currently under review [10].

One of the new proposals for this review is to have producers give more information on product characteristics as regards the environment. European product standards will then have to be prepared for product groups, indicating the possibilities for environmental aspects, the technical solutions available to prevent environmental impact and environmental risks, or providing instructions on how to reduce environmental impact and risks (Annex I, Part C of [10]).

Another proposal for the new CPR is to include information on aspects influencing future reuse and recycling (Annex I, Part D of [10])

This horizontal guideline already further defines some topics from the proposals for the new CPR. The tables below show which sections are relevant to which topics.

**Table A.1 — Comparison between new proposals for the CPR, Part C and the Horizontal guideline for construction products**

| CPR, Part C: Inherent product requirements | Horizontal guideline for construction products |
|---|---|
| a) maximising durability in terms of the expected average life span, the expected minimum life span under worst but still realistic conditions, and in terms of the minimum life span requirements | Lifespan |
| b) minimising whole-life-cycle greenhouse gas emissions | The environment (6.2) |
| c) maximising recycled content wherever possible without safety loss or outweighing negative environmental impact | Scenario for the subsequent cycle (5.3) |
| (d) selection of safe, environmentally benign substances | - |
| (e) energy use and energy efficiency | - |
| (f) resource efficiency | - |
| g) identification which product or parts thereof and in what quantity can be reused after de-installation (reusability) | Scenario for the subsequent cycle (5.3) |
| h) upgradability | Installation (6.4) |
| i) reparability during the expected life span | Installation (6.4) |
| j) possibility of maintenance and refurbishment during the expected life span | Installation (6.4), Use (6.5) |
| k) recyclability and the capability to be remanufactured | Scenario for the subsequent cycle (5.3) |

| | |
|---|---|
| l) capability of different materials or substances to be separated and recovered during dismantling or recycling procedures | Removing products and making them suitable for the subsequent cycle (6.6) |

**Table A.2 — Comparison between new proposals for the CPR, Part D and the Horizontal guideline for construction products**

| **CPR, Part D: Product information requirements** | **Horizontal guideline for construction products** |
|---|---|
| 1.1 Product identification | Data to be delivered for the subsequent cycle (7) |
| 1.2 Product description | Data to be delivered for the subsequent cycle (7) |
| 1.3 Transport, installation, maintenance, deconstruction and demolition rules | Data to be delivered for the subsequent cycle (7) |
| 1.4 Contact details of the manufacturer or the representative | - |
| 1.5 Contact details of relevant authorities in case of risky or faulty products | - |
| 1.6 Rules or recommendations for repair, deconstruction, reuse, remanufacturing, recycling or safe deposit. | Data to be delivered for the subsequent cycle (7) |

# Annex B
(informative)

# Comparison between Het Nieuwe Normaal 0.5 and the Horizontal guideline for construction products

A commonly used method to look at circularity performance is Het Nieuwe Normaal (HNN) [11]. This annex compares themes from HNN and this horizontal guideline for those readers who are familiar with HNN.

**Table B.1 — Comparison between Het Nieuwe Normaal 0.5 and the Horizontal guideline for construction products**

| **Het Nieuwe Normaal 0.5** | | | **Horizontal guideline for construction products** |
|---|---|---|---|
| Materials | | | |
| | Environmental impact and use of materials | | |
| | | Environmental impact (MPG) | The environment (6.2) |
| | | Embodied Carbon (MPG2) | |
| | | Construction Stored Carbon | - |
| | | Use of materials | - |
| | | Reuse potential | Scenario for the subsequent cycle (5.3) |
| | Flexibility of a building | | |
| | | Adaptive capacity | - |
| | | Detachability | Installation (6.4) |
| | Handling residual materials | | |
| | | Handling residual materials (demolition) | - |
| | | Handling residual materials (construction) | - |
| | Healthy materials | Toxicity | Product composition, removing products and making them suitable for the subsequent cycle (6.6) |

| | | | |
|---|---|---|---|
| Sustainable context | | | |
| | Energy | | - |
| | Water | | - |
| | Nitrogen | | - |
| Accelerators | | | |
| | Social | | - |
| | Management | | - |

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