MRPI®-EPD VERIFICATION PROTOCOL

MRPI
milieu relevante product informatie

OCTOBER 2021

4.0.V3

Requirements for the verification of MRPI®-EPDs

ECO PLATFORM
EPD
EN 15804 VERIFIED

MRPI®-EPD VERIFICATION PROTOCOL OCTOBER 2021

4.0.v3

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1. INTRODUCTION

1.1. History Stichting MRPI® and ECO Platform

In the context of sustainable building the need for quantitative environmental information on building products was demanded from the market. To fulfil this demand the Dutch organisation for the suppliers to the construction industry (NVTB) established the Stichting MRPI® (Milieu Relevante Product Informatie) in 1997. Since 1997 the organisation worked on the MRPI® system with support from the former Dutch Ministry of Housing and Environment. Goal was to use MRPI® as a means to communicate unambiguous and reliable environmental information on building materials and building products. Manufacturers communicate the information with an EPD for building products, in fact an MRPI®-certificate. The MRPI®-certificate is the current Dutch variant of an EPD type III.

The objective of the ECO Platform is the development of verified environmental information of construction products, in particular type III declarations called EPD. The ECO Platform coordinates the development of consistent EPD programs in Europe and stimulates the use of a common implementation of the EPD methodology for the European market which will lead to mutual recognition of EPD between EPD programs.
MRPI® is the Dutch program operator and member of the ECO Platform. A company interested in using the EPD across national borders may - for better recognition and acceptance – use the ECO EPD verified logo on the MRPI®-EPD certificate.

1.2. EN 15804, amendment A1 and EN 15804, Amendment A2

From November 2019 Amendment A2 for EN 15804 was officially published. This new version differs significantly from the EN 15804 with Amendment A1. The biggest difference is the introduction of a new methodology for the impact assessment as particularly the use of fundamentally different models to some impact categories make that Environmental Product Declarations (EPDs) under the new standard cannot be compared to those developed using the old standard. As a consequence the transition period is relatively long (3 years until November 2022). In order to harmonize their approach and facilitate the transition to EN 15804 + A2 the EPD program operators (POs) organized in the ECO Platform have agreed the following measures:

- POs will continue to verify and publish EPDs following EN 15804 + A1 as long as the market requires it (and the standard is in force); POs will constantly observe the market and coordinate sunset clauses for EN 15804 + A1;
- In order to avoid confusion all ECO Platform EPDs following EN 15804 + A2 will bear a Ref. A1 to said standard on the title page.

Practically this means:

- The MRPI®-EPD certificate can be based on EN 15804 + A1;
- The MRPI®-EPD certificate can be based on EN 15804 + A2;
- Specifically for the Dutch market Stichting MRPI® can publish both results according to EN 15804 + A1 and EN 15804 + A2.

In this document the specific verification aspects relating to A2 will be highlighted at the end of each section when relevant.

1.3. Structure verification protocol

The verification protocol consists of:

- Instructions for the verification by the recognized verifier (chapter 3);
- Verification procedure (chapter 4);
- Literature (chapter 5).

Annex A "Core checklist for the verification" presents the tables which the recognized verifier has to fill in to assess the MRPI®-EPD;

1.4. Types of MRPI®-EPD certificates

MRPI® can publish a certificate for the European market (MRPI®-EPD certificate) and a certificate for the Dutch market which is also valid for the European market (MRPI®-EPD+ certificate)[1].
The main differences between a MRPI®-EPD+ certificate and a MRPI®-EPD certificate are:

- the data of the MRPI®-EPD+ certificate can be included in the Dutch Environmental Database;
- the MRPI®-EPD+ must use Ecoinvent as a background database;
- the MRPI®-EPD+ contains toxicity indicators (HTP, FAETP, MAETP, TETP).

Further the table declaring the environmental impacts per functional or declared unit can also show the Environmental Cost Indicator and the indicator ADPF (= Abiotic Depletion Potential for fossil resources) expressed in kg Sb-eq. (see Figure 1).

ENVIRONMENTAL IMPACT per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3
ADPE	kg Sb-eq.	1.37E-6	5.85E-6	1.69E-5	2.41E-5
ADPF	MJ	1.85E+1	5.41E+1	6.39E+2	7.11E+2
GWP	kg CO2-eq.	1.23E+0	3.93E+0	1.17E+2	1.22E+2
ODP	kg CFC11-eq.	1.38E-7	6.38E-7	7.93E-6	8.71E-6
POCP	kg ethene-eq.	9.76E-4	2.30E-3	2.21E-2	2.54E-2
AP	kg SO2-eq.	8.95E-3	2.37E-2	2.44E-1	2.77E-1
EP	kg (PO4)3--eq.	1.64E-3	5.08E-3	2.84E-2	3.51E-2
Toxicity indicators (Dutch market)					
HTP	kg DCB-eq.	3.90E-1	1.16E+0	1.12E+1	1.27E+1
FAETP	kg DCB-eq.	1.84E-2	3.21E-2	1.17E-1	1.68E-1
MAETP	kg DCB-eq.	3.70E+1	1.09E+2	5.09E+2	6.55E+2
TETP	kg DCB-eq.	1.33E-3	4.93E-3	1.01E-1	1.07E-1
Environmental Cost Indicator (Dutch market)					
ECI	Euro	1.55E-1	4.62E-1	8.27E+0	8.89E+0
ADPF in kg Sb-eq. (Dutch market)					
ADPF	kg Sb-eq.	8.14 E -3	2.66 E -2	4.15 E -1	4.50 E -1

Figure 1: Indicators on the MRPI-EPD+ for the Dutch market

From January 2021 it is mandatory for MRPI®-EPD certificates for the Dutch market to also have the environmental indicators (core and additional) according to A2 being published. See section 2.3 for more details on the environmental indicators.

[1] *Stichting MRPI® develops with the Nationale Milieudatabase (NMD) a specific PCR-NL which explains in detail the Dutch requirements.*

For the MRPI®-EPD+ certificate the methodology can be the “Bepalingsmethode" [7]. This is a requirement if the environmental data has to be taken up into the Dutch environmental database (NMD). The "Bepalingsmethode" is based on EN 15804 but contains some specific rules (e.g. the use of specific Ecoinvent data). Together with the Nationale Milieudatabase (NMD) a specific PCR-NL is developed which explains in detail the Dutch requirements.
For an MRPI®-EPD certificate the EN 15804 is the main methodology to be used.

In the rest of this document both are referred to as “the MRPI®-EPD certificate” and the methodology as “EN 15804”.

A2
When the MRPI®-EPD certificate is based on A2 this will be stated under section “Scope of declaration” at page 2. For the MRPI®-EPD+ the following is recommended for the Dutch market:

- From July 2020 both LCA indicators according to A1 and A2 can be presented on the MRPI®-EPD certificate or only LCA indicators according to A1;
- From January 2021 both LCA indicators (core and additional) according to A1 and A2 must be presented.

2. REQUIREMENTS FOR A MRPI®-EPD CERTIFICATE

2.1. Documentation and project dossier

The organization/producer/manufacturer or delegated LCA consultant delivers a project dossier to the MRPI® recognized verifier. The project dossier consists of:

- a LCA project report;
- the MRPI®-EPD certificate(s).

The manufacturer has to store the project dossier at least 1 year after the validity of the MRPI®-EPD certificate has ended. Since the MRPI®-EPD certificate is valid for 5 years the project dossier must be stored at least 6 years.
The project dossier contains at least the parts mentioned in chapter 8 of NEN-EN15804. The project dossier stays with the manufacturer and must be available for inspection by an independent third party appointed by Stichting MRPI®. This in case of verification of the verification protocol or in case of an appeal procedure.

2.2. LCA project report

The LCA must be done according to “EN 15804+A1 or EN15804+A2” for the MRPI®-EPD certificate. The manufacturer is free to choose as both standards are currently valid in the transition period. The LCA for the MRPI®-EPD+ certificate can be done according to the "Bepalingsmethode” [7] which is based on EN15804. When the data has to be put in the NMD the "Bepalingsmethode" must be used. The language of the LCA report can be English, German or Dutch and the LCA report will be made available to the recognized verifier. The LCA contains at least the elements stated in chapter 8.2 of NEN-EN15804.

2.3. Spreadsheet for the MRPI®-EPD certificate

The MRPI®-EPD certificate is generated by a tool based on a template spreadsheet filled in by the delegated consultant. At the first tab of the spreadsheet the language (Dutch or English) is chosen for the MRPI®-EPD certificate. The yellow cells have to be filled in. Next to the yellow cells red help text offers guidance on the expected content (*Figure 2*).

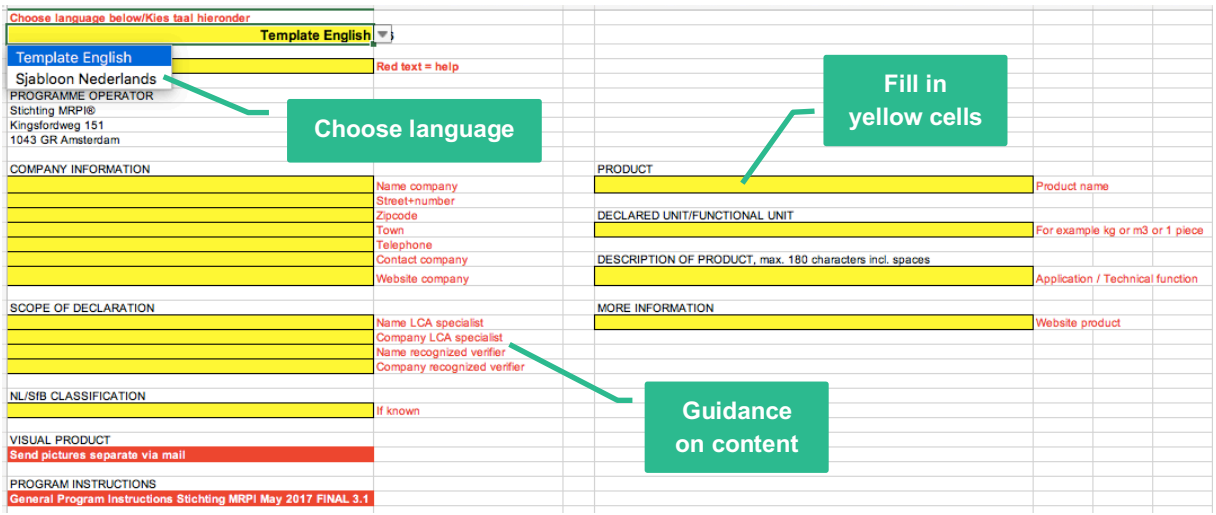

Figure 2: Template spreadsheet for the tool to generate MRPI®-EPD certificate (tab1).

Tab 2 of the spreadsheet contains the detailed product description, the component table and the scope and type (*Figure* 3). The component table has room for 9 components of the product. It is not necessary to fill them all. If the components are classified then this must be stated in the table.

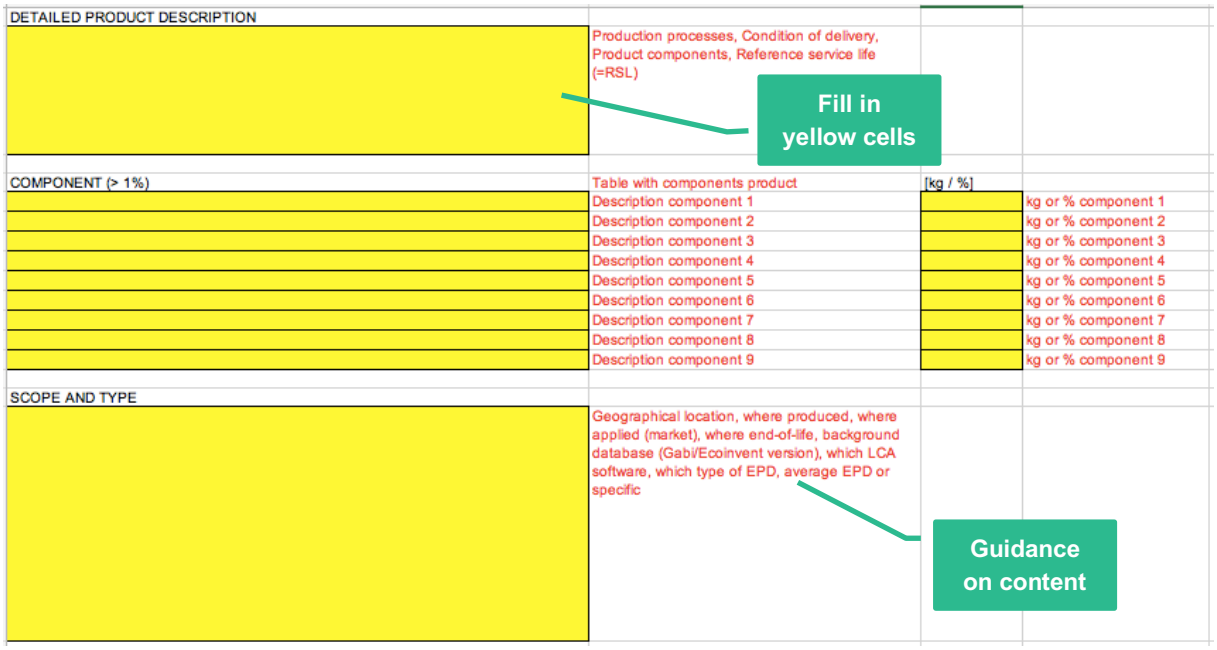

Figure 3: Template spreadsheet for the tool to generate MRPI-EPDs (tab2)

Tab 3 is used for the representativeness section and the calculation rules. The representativeness is mainly relevant for products that are an average for example when the product is an average of products produced at multiple sites and/or by multiple companies (*Figure 4*).

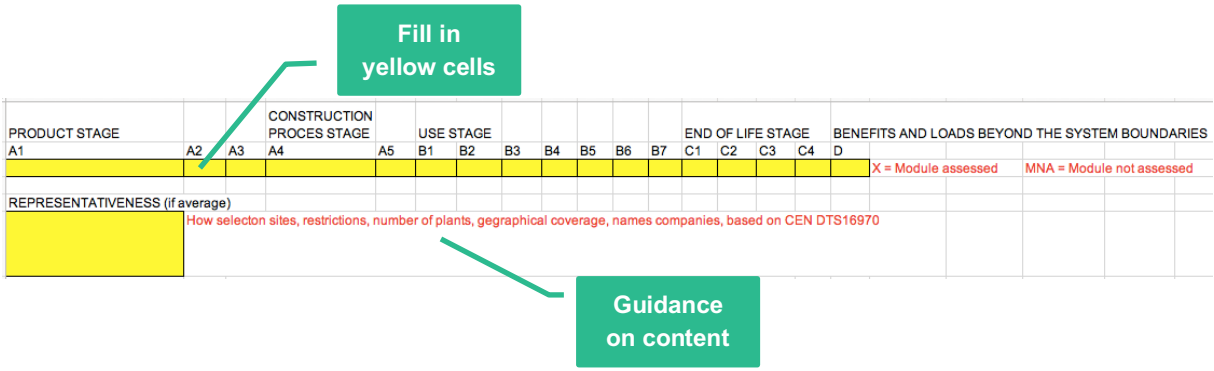

Figure 4: Template spreadsheet for the tool to generate MRPI-EPDs (tab3, part 1)

Further tab 3 is used for the calculation rules including room for two tables. If no tables are used than the yellow cells can be left blank (*Figure 5*).

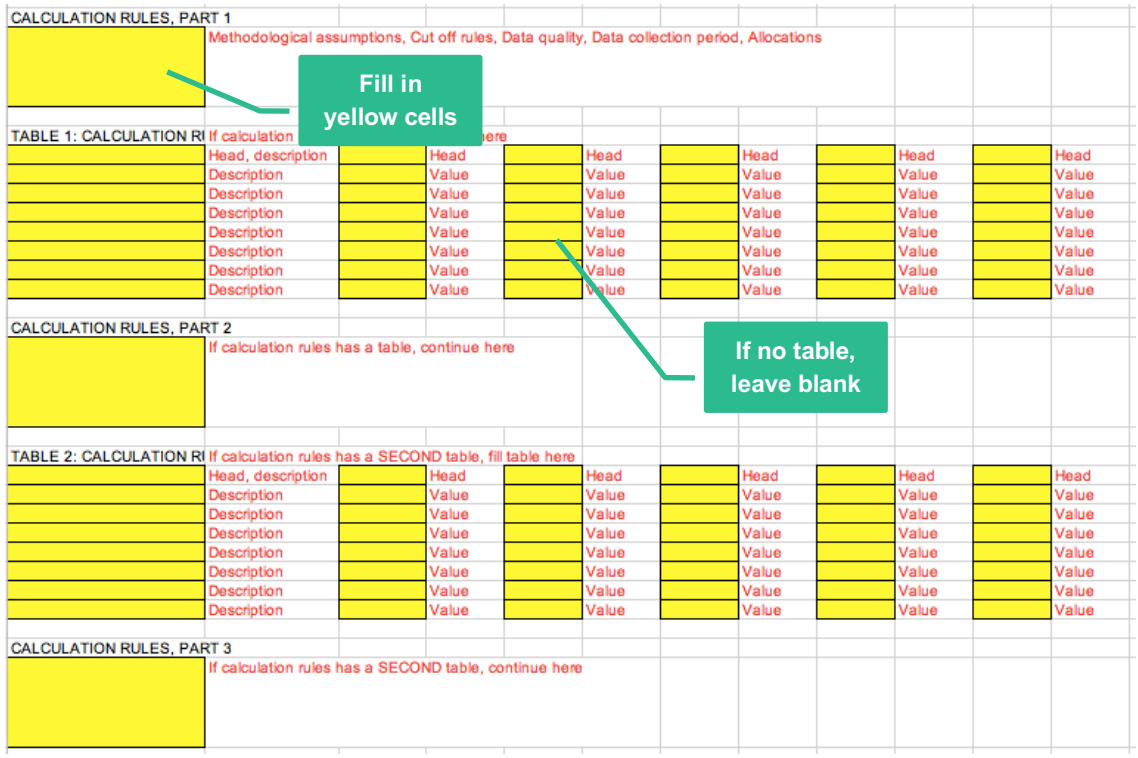

Figure 5: Template spreadsheet for the tool to generate MRPI-EPDs (tab3, part 2)

Tab 4 of the spreadsheet gives room for the scenarios and additional technical information. A total of 5 tables can be filled in but if no tables are used they can be left blank. Finally tab 4 ends with the declaration of SVHC which is mandatory to declare, the references and the remarks (*Figure 6*).

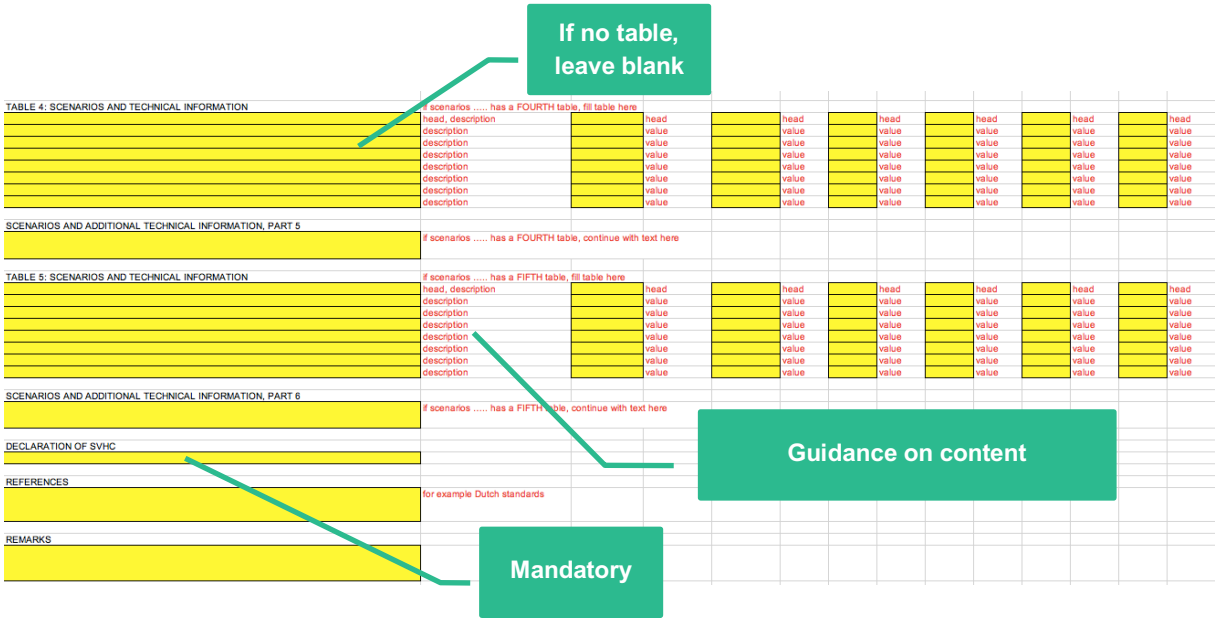

Figure 6: Template spreadsheet for the tool to generate MRPI-EPDs (tab4)

Tab 5, 6, 7 and 8 of the template are used for the tables with the environmental indicators according to EN 15804 for a specific market with the appropriate annex. There are 4 options and only 1 tab has to be filled in:

- Tab5: Indicators according to EN 15804+A1 for the EU market;
- Tab6: Indicators according to EN 15804+A2 for the EU market;
- Tab7: Indicators according to EN 15804+A1 for the EU/NL market (until 1 January 2021);
- Tab8: Indicators according to EN 15804+A1+A2 for the EU/NL market (from 1 January 2021).

Each tab starts with a row to select all modules that are declared on the MRPI®-EPD certificate (*Figure 7*).

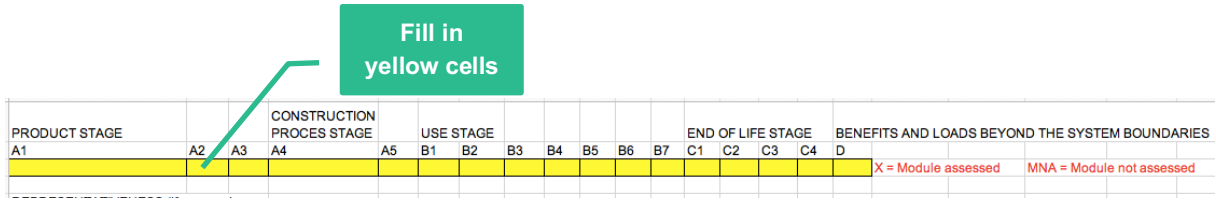

Figure 7: Template spreadsheet for the tool to generate MRPI-EPDs (tab5/6/7/8, part 1)

Further tab5/6/7/8 shows the tables with the relevant indicators according to EN 15804 to be filled in. For the detailed list with all indicators download the template[2] at www.mrpi.nl. The main features of the indicator lists are described next.

- Tab5: Indicators according to EN 15804+A1 for the EU market
  The indicators are the old (7) ENVIRONMENTAL IMPACT indicators according to A1. Further the OUTPUT FLOWS AND WASTE CATEGORIES and RESOURCE USE indicators must be filled. These are the same for A1 and A2 and thus for all tabs.

- Tab6: Indicators according to EN 15804+A2 for the EU market;
  The indicators are the new (13) CORE ENVIRONMENTAL IMPACT indicators plus the new (6) ADDITIONAL ENVIRONMENTAL IMPACT indicators according to A2. Further the OUTPUT FLOWS AND WASTE CATEGORIES and RESOURCE USE indicators must be filled which are the same as in A1 and thus the same for all tabs. Finally a table with the declaration of the BIOGENIC CARBON CONTENT must be declared.

- Tab7: Indicators according to EN 15804+A1 for the EU/NL market (until 1 January 2021);
  This tab has the same indicators as tab5 but the ENVIRONMENTAL IMPACT indicators have 4 extra indicators for toxicities, the environmental cost indicator (ECI) and indicator ADPF expressed in [kg Sb-eq.]. See section 1.4 for an explanation in detail. This option is possible until the 1st of January 2021. After this date the indicators as in Tab8 are required for the Dutch market;

- Tab8: Indicators according to EN 15804+A1+A2 for the EU/NL market (mandatory from 1 January 2021).
  Tab8 contains all indicators to be declared according to A1 including toxicities, the environmental cost indicator (ECI) and indicator ADPF expressed in [kg Sb-eq.all]. Further all environmental indicators according to A2 must be declared.

[2] *Template-Sjabloon MRPI®-EPD certificate English Dutch v7*

2.4. The generated MRPI®-EPD certificate

This paragraph describes the MRPI®-EPD certificate generated by the tool and provides some extra guidance on the produced MRPI®-EPD certificate.

Front page (1):
At the top to the right the logo of the company is shown. The resolution of the logo must be at least 300dpi. In the middle, on the left side is room for an image showing the product in it's application. This could be a commercial, glossy picture of the product applied in the final building. It is not mandatory to provide a specific image but the image of the product itself (visual product, see page 1) can also be used. To the right in the middle is a green section with the registration numbers and (release) dates which is filled in by Stichting MRPI®. If the LCA data of the MRPI-EPD® certificate goes into the Dutch Environmental Database (NMD) an extra logo is added[3].

Page 2:
The part at the top contains the company and product information. The description of the product can be a maximum of 185 characters including spaces. Below the description is room for a visual of the product. This image can also be used for the front page if the manufacturer wishes. The head "more information" refers to a specific website or page for the product. At the scope of the declaration it is necessary to mention the verifier and the LCA practitioner. When a PCR has been used it must be stated at the scope.

A2
When the MRPI®-EPD certificate is based on A2 this must be declared in the scope.

Page 3:
This page starts with the "detailed product description". Where the "Description of product" of page 2 has limited space here the manufacturer can elaborate more in detail the ins and outs of the product. The table at the end of the product description shows the components of the product and their respective weight. Only components with a mass bigger than 1% of the total mass have to be shown. Sometimes the components of the product are confidential. Than this must be stated in the table.

At the "scope and type" the type of MRPI®-EPD certificate has to be stated in the life cycle stage table. According to A1 the manufacturer can choose 3 types:
- Cradle-to-gate
At the minimum the manufacturer declares the product stage only. This is Module A1, A2 and A3.
- Cradle-to-gate with options
This MRPI®-EPD covers also the product stage but adds other modules from the lifecycle which the manufacturer has information about. The manufacturer can declare (for example) the transport to the building site (A4) or information on the demolition stage (Module C). Further information Module D may be included.
- Cradle-to-grave
This is the full lifecycle of the product according to the system boundary. The MRPI®-EPD certificate covers all the lifecycle stages and may include Module D. In the table the type of MRPI®-EPD is shown by putting X-marks at the modules declared. The other modules are filled in with MNA (= Modules Not Assigned). If the Module is MNA than the module is not shown in the environmental impact tables.

[3] *Stichting MRPI® develops with the Nationale Milieudatabase (NMD) a specific PCR-NL which explains in detail the Dutch requirements.*

A2
According to Section 5.2 the following type of MRPI®-EPDs are possible for construction products:
a) Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D);
b) Cradle to gate with options, modules C1–C4, module D and with additional modules (A1–A3 + C + D and additional modules). The additional modules may be one or more selected from A4–A5 and/or B1–B7;
c) Cradle to grave and module D (A+B+C+D);
d) Cradle to gate (A1–A3);
e) Cradle to gate with options (A1–A3 and additional modules). The additional modules may be A4 and A5.

MRPI®-EPDs of type d and type e in the list above shall only be used if the following three conditions are valid:

- the product or material is physically integrated with other products during installation so they cannot be physically separated from them at end of life, and
- the product or material is no longer identifiable at end of life as a result of a physical or chemical transformation process, and
- the product or material does not contain biogenic carbon.

The RSL (= Reference Service Life) only has to be declared when the use stage is covered in the EPD. Reference on how to estimate the RSL are given in the normative Annex A of EN 15804.

A2
See section 6.3.4 and normative Annex A with slightly adapted requirements.

Below the life cycle stage table is a simple flow diagram included which is at least subdivided in all life cycle stages. This diagram is mandatory according to EN 15804+A1.

When the EPD declares average values for an average product the “representativeness” has to be elaborated more in detail. Otherwise it can be stated that the EPD covers a specific product from a specific manufacturer and a specific site.

Page 5/6 etc.:
The result tables contain the values calculated for the modules declared at page 3 of the EPD. There are no blank cells. Modules not assessed (MNA) are not shown. There are 4 options for the tables the MRPI®-EPD certificate contains. These are described more in detail in section 2.3. For a detailed list of all indicators depending on each option download the template[4] at www.mrpi.nl.

A2
The environmental impact indicators differ from A1. For the environmental impacts section 7.2 of A2 shall be used. The MRPI®-EPD shall contain a core set of pre-determined environmental impact indicators (table 3). The MRPI®-EPD may also contain additional environmental impact indicators (table 4). This table must be shown in the MRPI®-EPD though it is not mandatory to fill it. In this case the indicator is shown as "ND (=Not Declared)". In the LCA project report the additional environmental impact indicators shall be calculated. Finally the MRPI®-EPD must contain disclaimers for each environmental impact indicator (table 5).
Indicators describing resource use must be declared in the MRPI®-EPD (table 6). The same holds for the waste categories (table 7) and output flows (table 8).
Extra according to A2 is the declaration of biogenic carbon content if this is more than 5% of the mass of the product at the factory gate (table 9).

Page 7-:
The "scenarios and additional technical information" are used to describe the scenarios for the modules beyond the production stage and are used in the building assessment. The manufacturer can declare (for example) a transport distance for Module A4 or the manufacturer can give guidance on the number of replacements (module B4). Further it is possible to give formulas calculating End-of-Life (EoL) scenarios other than the default EoL scenario given in the certificate tables.

The "declaration of SVHC" is mandatory to fill in. Also when the product doesn't contain substances on the list than this must be stated.
The "references" refers to standards, the original LCA report, studies, scientific papers and the software used. Remarks is not mandatory; if there are none state "none".

2.5. Assessment by the recognized verifier

The LCA report and the MRPI®-EPD certificate must satisfy the requirements of this verification protocol. This is verified by a recognized verifier of the Stichting MRPI®. The criteria the recognized verifier must satisfy are laid down in the recognition scheme [5] and an up-to-date list of recognized verifiers is published at http://www.mrpi.nl/licentiehouders The verification must be done according to the instructions in chapter 3 of this document.

[4] *Template-Sjabloon MRPI®-EPD certificate English Dutch v7*

3. INSTRUCTIONS FOR THE VERIFICATION BY THE RECOGNIZED VERIFIER

3.1. Documents to be verified

The verifier assesses the following documents:

- The LCA project report from the LCA consultant based on EN 15804 (MRPI®-EPD) and/or based on the “Bepalingsmethode” (MRPI®-EPD+);
- The MRPI®-EPD certificate or MRPI®-EPD+ certificate.

3.2. Procedure of the assessment

The verification shall ensure that the EPD/Type III environmental declaration is in compliance with EN 15804+A1 or EN 15804 + A2 (MRPI®-EPD) or the Bepalingsmethode (MRPI®-EPD+). Next to that the verification procedure shall confirm whether the information given in the declaration is in line with the LCA underlying the declaration and whether this information is valid and scientifically sound. Therefore the verifier has to use the checklist from Annex A to assess the LCA report and the MRPI®-EPD certificate. The checklist is a table with 5 columns (*Table* 1).

Table 1: General layout of the verification checklist.

1	General information – availability	Mandatory / optional	Ref. A1	C & A
1.1	Commissioner of LCA study, LCA practitioner	M	EN15804 ch.8.2	

Column 1 is the reference to the topic to be checked;
Column 2 is the description of the topic;
Column 3 specifies whether the topic is mandatory or optional;
Column 4 explains where to check in EN and/or ISO standards;
Column 5 is empty and has to be used by the MRPI® recognized verifier to state if the topic is approved. C & A stands for Checked and approved.
The checklist consists of two parts.

- Part A is used to check if the LCA project report is valid and scientifically sound.
- Part B is used to verify if the MRPI®-EPD certificate is in line with “EN 15804+A1 or EN 15804+A2”. In case of an MRPI®-EPD+ certificate the MRPI® recognized verifier must also verify the toxicity indicators (HTP, FAETP, MAETP, TETP).

3.3. Assessment per chapter

The final assessment per table/chapter is "yes" when all subjects in the table/chapter are answered with "yes", otherwise the final assessment is "no".

3.4. Final assessment

The dossier of the MRPI® recognized verifier consists of the parts specified in paragraph 4.7. If the verification is OK the MRPI®-EPD(+) certificate gets an "EPD verified" logo (*Figure 8*).

Figure 8: ECO-EPD verified logo

If the environmental data on the MRPI®-EPD+ certificate is also taken into the Dutch Environmental Database (NMD) than the MRPI®-EPD+ certificate gets the “Nationale Milieudatabase logo” at the front page (*Figure 9*).

Figure 9: Logo Nationale Milieudatabase

3.5. Apply for an MRPI®-EPD certificate

Figure 10 shows the procedure for applying for an MRPI®-EPD certificate.

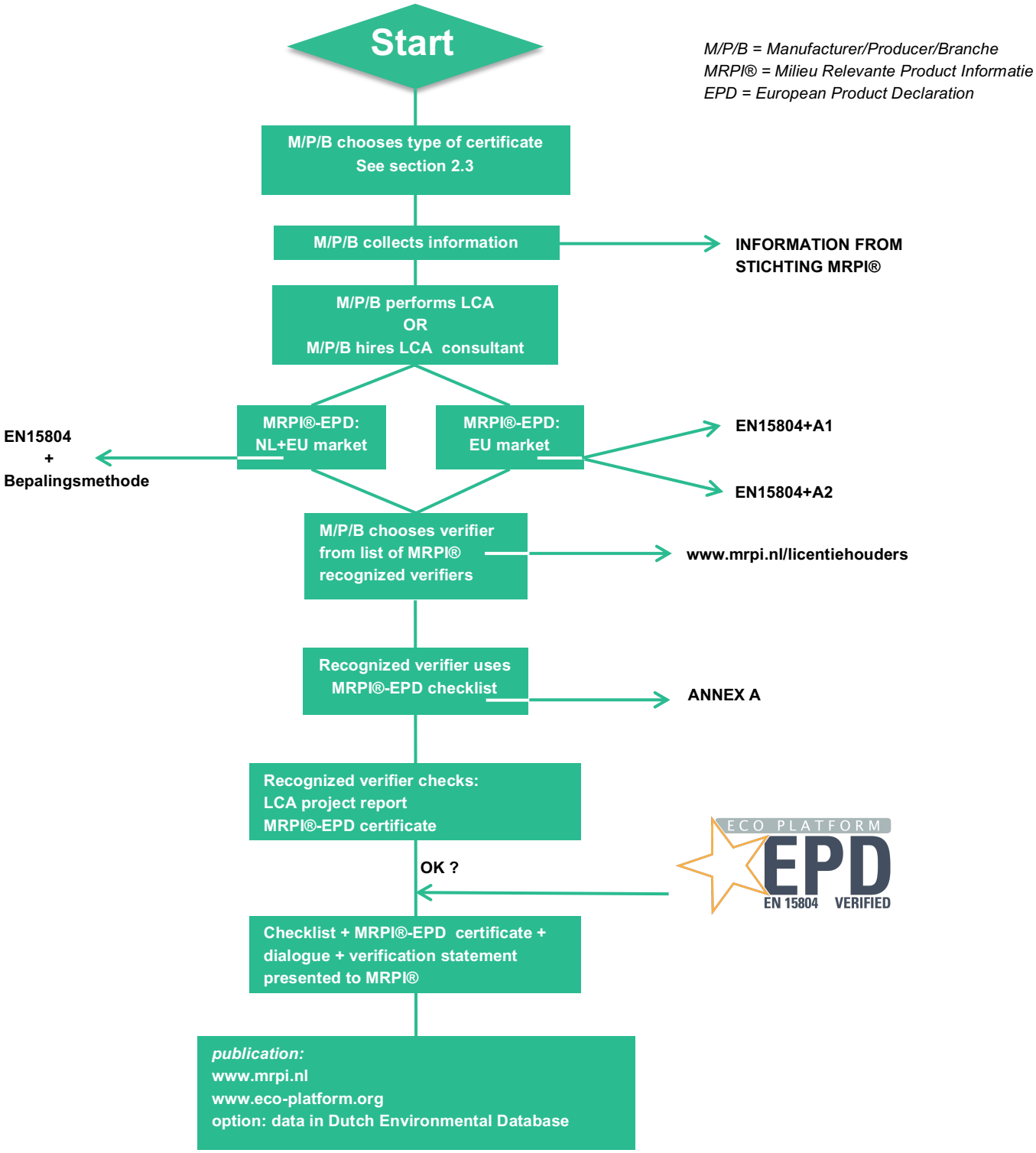

Figure 10: Procedure MRPI®-EPD certificate

Next section explains in detail the parts of the procedure.

3.6. Collection of information

The Stichting MRPI® supplies information on how to obtain an MRPI®-EPD certificate if clarification is needed. Strictly speaking this is not part of the official verification protocol. It is put in the figure to show the complete procedure.

3.7. LCA

How the LCA must be performed depends on the type of MRPI®-EPD certificate:

- MRPI®-EPD certificate for the EU market: according to EN 15804+A1 or EN 15804+A2 and ISO14040 and ISO14044 standards;
- MRPI®-EPD certificate for the NL and EU market: according to EN15804+A1 or EN 15804+A2 and the “Bepalingsmethode” and ISO14040 and ISO14044 standards.

Section 2.3 describes the type of MRPI®-EPD certificates more in detail.

3.8. Selection certified verifier

The manufacturer/branche/producer or delegated LCA consultant selects a MRPI® recognized verifier that is certified by the Stichting MRPI®. An up-to-date list of MRPI® recognized verifiers is shown on www.MRPI.nl/licentiehouders. The manufacturer makes agreements with the MRPI® recognized verifier on the planning and costs of the verification.

3.9. Dossier for verification by the MRPI® recognized verifier

The manufacturer/branche/producer or delegated LCA consultant offers the MRPI® recognized verifier a dossier which exists at least of:

- The LCA-project report (chapter 2.2)
- The MRPI®-EPD certificate (chapter 2.3)

3.10. Review of the dossier

The MRPI® recognized verifier reviews the dossier according to chapter 2 of this verification protocol. For the review the MRPI® recognized verifier uses the checklist provided in Annex A from this document. The MRPI® recognized verifier reports his final judgement to the manufacturer.

3.11. Complaints about the review

When the manufacturer doesn't agree with the final judgement of the MRPI® recognized verifier or has other complaints on the verification he can report it to Stichting MRPI®.
If the manufacturer has complaints relating to content he can start an appeal procedure at Stichting MRPI®.
If the manufacturer has complaints relating to the procedure of the assessment and the MRPI® recognized verifier they will be dealt with according to the recognition scheme for verifiers [5].
When the MRPI® recognized verifier has complaints on a certain topic (for example the verification protocol), it can be reported to Stichting MRPI®. MRPI® recognized verifiers have the right, in case of a complaint, to address the complaint at the regular meetings with Stichting MRPI®. The complaint shall be discussed without making reference to the specific product or manufacturer unless the manufacturer states he has no objections.

3.12. Dossier to submit to Stichting MRPI® to apply for MRPI®/EPD

When the final judgement of the recognized MRPI® verifier is OK the manufacturer or delegated LCA consultant delivers next dossier to Stichting MRPI®:

- The MRPI®-EPD certificate (this is the template spreadsheet filled in, see Section 2.3);
- The checklists from Annex A (Part A and Part B) filled in by the MRPI® recognized verifier;
- The dialogue document containing discussion between MRPI® recognized verifier and LCA specialist;
- The signed verification statement.

Stichting MRPI® never receives the original LCA report. This is because the LCA report contains confidential information. This means the producer/manufacturer needs to store the LCA report at least 1 one year after the validity of the MRPI®-EPD is expired; this is a total of 5+1 = 6 years.

3.13. Assessment of the application by Stichting MRPI®

Stichting MRPI® checks the completeness of the dossier (see section 3.11) including the checklists, verification statement and dialogue document. When the dossier is complete, the verification statement is signed and the fee to Stichting MRPI® has been paid, Stichting MRPI® assigns the MRPI®-EPD number to the MRPI®-EPD certificate and adds the ECO-EPD verified logo to the MRPI®-EPD certificate. Further Stichting MRPI® allows the manufacturer to publish the MRPI®-EPD certificate on his own canals and publishes the certificate on www.MRPI.nl/epd-certificaten. This is the location where the original can be found the coming 5 years. Further the MRPI®-EPD certificate is published on the ECO platform website (www.eco-platform.org). The environmental data from the MRPI®-EPD certificate can also be contained in the Dutch National Environmental Database.

3.14. Validity of MRPI®-EPD certificate

The MRPI®-EPD(+) certificate is valid for a period of 5 years.

4. LITERATURE

1. Guidance Paper Verification, Versie 1.1, ECO Platform, October 2015.
2. NEN-EN15804+A1, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products, NEN, November 2013.
3. NEN-EN 15942, Sustainability of construction works - Environmental product declarations – Communication format, business to business, NEN, October 2011.
4. NEN-EN 15978, Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method, NEN, November 2011.
5. Recognition scheme verifiers MRPI® May 2017, Stichting MRPI®, May 2017 FINAL.
6. General Programme Instructions MRPI® May 2017, Stichting MRPI® , May 2017 FINAL.
7. Bepalingsmethode “Milieuprestatie Gebouwen en GWW-werken” Versie 2.0 November 2014.
8. NEN-EN15804+A2, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products, NEN, November 2019.

COLOPHON

Stichting MRPI®
www.mrpi.nl
www.mrpi-mpg.nl

October 2021

ANNEX A: DOCUMENTS FOR THE VERIFICATION

This checklist presents the items that have to be verified as a minimum. It is presented as a 'tick-box' and can be used as such, but it should be clear from the verification report that discussions have taken place and (if applicable) improvements have been made following the MRPI® recognized verifier's comments and recommendations. The core checklist is limited to data presented in the MRPI®-EPD.

A. Verification Statement

Report on verification of the MRPI®

Environmental Product Declaration ……. *[Declaration number]*

for …… *[Product]* by ……. *[Company]*

Verification statement:

The MRPI® recognized verifier shall give a statement about his work and the result, clarifying at minimum:

- the MRPI®-EPDs concerned
- that the work concerned a verification (not a certification)
- that the verification has been done 3rd party independent
- that the MRPI®-EPD was verified according to EN 15804+A1 or EN 15804+A2.
- that the program rules / PCR used.

Example:

I hereby confirm that, following detailed examination as independent 3rd party verifier, I have not been able to trace any relevant deviations by:

The Environmental Product Declaration: …….. [declaration number]

Issued for: …….. [product name(s)]

By: …….. [company name]

and by its project report from the requirements outlined in the corresponding product category regulations based on:

- *EN 15804+A1 / EN 15804+A2 [choose EN 15804+A1 or EN 15804+A2]*
- *…….. [Name of the relevant PCR]*

The company-specific data have been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity.

The project report on the Life Cycle Assessment is filed at ……. [Manufacturer]

and the report(s) on features of environmental relevance are filed at Stichting MRPI® .

Name and signature of

external inspector *Place and date*

>>> *>>>*

B. Checklist part A: Calculation rules for the LCA and requirements on the LCA report:

This checklist presents the items that have to be verified as a minimum. It is presented as a 'tick-box' and can be used as such, but it should be clear from the verification report that discussions have taken place and (if applicable) improvements have been made following the MRPI® recognized verifier's comments and recommendations. The core checklist is limited to data presented in the MRPI®-EPD.

Verification checklist LCA project report

In principle there are 4 types of MRPI®-EPD the manufacturer can choose. These are described in detail in section 2.3. The verification for all types certificates is essentially the same. For the MRPI®-EPD certificates for the Dutch market also the toxicity indicators must be verified.
The issues in the checklist below must be checked in the verification. The check consists of checking if the issue is described in the LCA project report and if it is line with the requirements and guidelines in the applicable references (EN 15804+A1 or EN 15804+A2, other standards or a PCR[5]). Most issues are mandatory to check, some can be optional. If the issue is in line with the requirements and/or accepted by the verifier, the box "C & A" can be ticked. C & A stands for checked and approved. The table contains a column referring to a verification according to A1 and a column referring to a verification according to A2; only one of them must be filled in. Sections where A2 differs from A1 are highlighted in grey in the verification checklist.

If the LCA is already critically reviewed according to ISO 14044 before the verification, no duplications are necessary.

Any deviations from the requirements should be reported by the MRPI® recognized verifier and the dialogue between MRPI® recognized verifier and LCA consultant should be made transparent as well improvements made following the verification process. This can be done separately from the checklist in the dialogue document (an example is provided after the checklist).

1	General information - availability	M/O*	Ref. A1	Ref. A2	C & A
1.1	Commissioner of LCA study, LCA practitioner	M	§8.2	§8.2	
1.2	Date of issue of LCA report	M	§8.2	§8.2	
1.3	Statement that the LCA study has been performed in accordance with the requirements of EN 15804 and applicable PCRs	M	§8.2 + applicable PCR	§8.2 + applicable PCR	
1.4	Any other independent verification of the data given in the LCI/LCA documentation?	O			
2	**General information - availability**	**M/O***	**Ref. A1**	**Ref. A2**	**C & A**
2.1	Reasons for performing the LCA.	M	§8.2	§8.2	
2.2	Intended application – (e.g. for EPD, databases, publication etc.) Is the LCA designed in such a way that it allows B2B communication for environmental assessments of buildings?	M	§8.2	§8.2	
2.3	Target group (B2B, B2C, …)	M	§8.2	§8.2	
3	**General information - availability**	**M/O***	**Ref. A1**	**Ref. A2**	**C & A**

[5] *Stichting MRPI® uses EN 15804+A1 and EN 15804+A2 as the core PCR.*

3.1	Functional / Declared unit, including relevant technical specification	M	§6.3.1/6.3.2 and/or applicable PCR or additional specific requirements for certain product groups	§6.3.1/6.3.2 and/or applicable PCR or additional specific requirements for certain product groups	
3.2	If product groups (similar products from one manufacturer and/or from different production plants) are formed as averages: a. Calculation rules for the formation of averages b. Representativeness of averages	M	§8.2	§8.2	
4	**General information - availability**	**M/O**	**Ref. A1**	**Ref. A2**	**C & A**
4.1	Composition of the product The level of detail: the main components necessary to understand what type of product is concerned (detailed mass description is not necessary if confidential) Note: It should be settled before the verification how confidential information is dealt with (acc. to provisions ISO 14025)	M	ISO 14025	ISO 14025	
4.2	Description of technical and functional characteristics and area of intended application in the building	M	Applicable PCR	Applicable PCR	
4.3	Flow diagram of main production processes and visualization of system boundaries. Level of detail: see 4.1 Note: It should be settled before the verification how confidential information is dealt with (acc. to provisions ISO 14025)	M	ISO 14025	ISO 14025	
5	**General information - availability**	**M/O**	**Ref. A1**	**Ref. A2**	**C & A**
5.1	Comprehensive declaration of modules A1 to A3 as a minimum requirement, if necessary as an aggregated module A1-A3	M	§6.3.4	§6.3.5	
5.2	A1 to A3: System boundary a. Clear description of what the modules cover b. System boundary to nature (e.g. forest in wood production) c. Use of secondary materials and secondary fuels and waste produced (check end-of-waste state) d. If applicable: Ref. A1 to the certificate of the offsetting of CO_2	M	§6.3.4.2 and applicable PCR	§6.3.5.2 and applicable PCR	
5.3	A1 to A3: Allocation of co-products: a. Specification of the “end-of-waste state” b. Selection of the allocation factors for co-product allocation c. Justification of specific allocation processes (e.g. if data are not available to allocate according to the EN15804 rules) d. Presentation of the energy and material flows as a result of deviating allocation processes	M	§6.4.3.2 + annex B.1	§6.4.3.2 + annex B.1	

	e. No declaration of loads and benefits in Module D from allocation in A1-A3				
5.4	A4 to A5 (optional module): Clear description and content of modules	M	§6.3.4.3 and applicable PCR	§6.3.5.3 and applicable PCR	
5.5	Accounting losses in the modules in which they arise (e.g. A4, transport to construction site)	M	§6.3.4.1	§6.3.5.1	
5.6	B1 to B5 (optional module): Delineation and content of modules	M	§6.3.4.4 and applicable PCR	§6.3.5.4.2 and applicable PCR	
5.7	B6 and B7 (optional module): Delineation and content of modules	M	§6.3.4.4 and applicable PCR	§6.3.5.4.3 and applicable PCR	
5.8	C1 to C4 (optional module): Delineation and content of modules	M	§6.3.4.5 and applicable PCR	§6.3.5.5 and applicable PCR	
5.9	C3 (optional module): Justification of the "end-of-waste state" a. Existing purpose b. Existing market or demand c. Compliance with technical requirements and legal guidelines d. Fulfils limit values for Substances of Very High Concern (SVHC)	M	§6.3.4.5 + annex B.1 and applicable PCR	§6.3.5.5 + annex B.1 and applicable PCR	
5.10	C4 (optional module): Carefully check the correct allocation	M	§6.3.4.5 and §6.3.4.6	§6.3.5.5 and §6.3.5.6	
5.11	D (optional module): System boundary and contents of Module justified	M	§6.3.4.6	§6.3.5.6	
5.12	D (optional module): Check if the net flow calculation is done correctly taking into consideration relevant factors, e.g.: a. Processing losses b. Inputs in Modules A1 to A3 (and A4 to B5 if necessary)	M	§6.3.4.6 and §6.4.3.3	§6.3.5.6 and §6.4.3.3	
5.13	D (optional module): No benefits or loads of allocated co-products	M	§6.4.3.3	§6.4.3.3	
6	**General information - availability**	**M/O***	**Ref. A1**	**Ref. A2**	**C & A**
6.1	Selection of the power mix in accordance with the location of the production site(s)	M	CEN TR15941 and applicable PCR	CEN TR15941 and applicable PCR	
6.2	If applicable: Validity of the certificates for green power	O	Applicable PCR	Applicable PCR	
7	**General information - availability**	**M/O***	**Ref. A1**	**Ref. A2**	**C & A**
7.1	If applicable: Selecting allowable certificates in accordance with the PCR	O	Applicable PCR	Applicable PCR	
7.2	If applicable: Offsetting in accordance with the requirements from the individual program operators	O	Applicable PCR	Applicable PCR	
8	**General information - availability**	**M/O***	**Ref. A1**	**Ref. A2**	**C & A**
8.1	Transparent description of the system boundaries: a. Representativeness (temporal, geographical, technological) b. Assessment period for each module considered in the Life Cycle Assessment (eg one year average, etc) c. Omissions of life cycle stages, processes and data requests d. Assumptions with regard to energy and electricity production incl. year of reference. It	M	ISO 14040 §8.2	ISO 14040 §8.2	

	should also be transparent which electricity/energy model is applies as avoided product if energy recovery is included in the optional Module D. e. Assumptions concerning other relevant background data where relevant for the system boundary				
9	**General information - availability**	**M/O***	**Ref. A1**	**Ref. A2**	**C & A**
9.1	Selection of the cut-off criteria, description of application of the criteria and assumptions	M	§6.3.5 and §8.2 and applicable PCR	§6.3.6 and §8.2 and applicable PCR	
9.2	List of excluded processes available		§8.2	§8.2	
10	**General information - availability**	**M/O***	**Ref. A1**	**Ref. A2**	**C & A**
10.1	Data collection, including data quality issues, according to LCA rules	M	ISO 14044:2006, section 4.3.2; Documentation ISO 14040 §6.3.6	ISO 14044:2006, section 4.3.2; Documentation ISO 14040 §6.4.1	
11	**General information - availability**	**M /O***	**Ref. A1**	**Ref. A2**	**C & A**
11.1	Statement that the scenarios included are currently in use and are representative for one of the most likely scenario alternatives. Check the PCR / program rules if average scenarios are allowed. (preferably no average scenarios for various alternatives)	M	§6.3.8 Applicable PCR	§6.3.9 Applicable PCR	
11.2	Documentation of the relevant technical information, e.g. recycling or reuse rates, with reference to the literature source	M			
12	**General information - availability**	**M/O***	**Ref. A1**	**Ref. A2**	**C & A**
12.1	Selection and use of generic data and background data justified and validity demonstrated (Commonly used and publicly available databases in Europe are: GaBi database, EcoInvent, Okobau.dat, ILCD, EIME … [to be extended by Program Operators])	M	§6.3.6 EN 15941 and applicable PCR	§6.3.7 EN 15941 and applicable PCR	
12.2	Data as follows: a. < 10 years for background data b. < 5 years for manufacturer's data c. Data manufacturer based on 1 year average d. Time period of 100 years in case of a landfill scenario, longer if relevant e. Technical background complies with physical reality f. Integrity of generic data records, system limit and cut-off criteria for generic data records validity demonstrated	M	§6.3.7 EN15941 and applicable PCR	§6.3.8 EN15941 and applicable PCR	
12.3	Documentation on data / background data: a. Name of the (background) data record, its source (data base, literary source etc.), year of data collection and its representativeness b. Handling missing data c. Assessing data quality	M	EN15941 and applicable PCR	EN15941 and applicable PCR	
12.4	Manufacturing data should be reproducible, e.g. by available data management systems Random checks could be carried out, or based on	O			

	importance; some data could be checked in the verification.				
13	**General information - availability**	**M/O***	**Ref. A1**	**Ref. A2**	**C & A**
13.1	General allocation principles applied (avoidance of allocation, no double counting / omissions, uniform application of the allocation rules etc.)	M	ISO14044:2006 4.3.4	ISO14044:2006 4.3.4	
13.2	Presentation and justification of allocations in the use of secondary materials or secondary fuels as raw materials	M	§6.4.3 and §8.2 and applicable PCR	§6.4.3 and §8.2 and applicable PCR	
13.3	Presentation and justification of allocations in the plant (delineation from other products in a plant)	M			
13.4	If applicable: Presentation and justification of allocation of multi-input processes (e.g. landfilling or incineration)	M			
13.5	Co-product allocation correctly applied, see also 5.3	M	§6.4.3.2	§6.4.3.2	
13.6	Documentation of allocation factors used and their (independent) sources	M			
13.7	Allocation process for reuse, recycling and recovery, check specifically: a. Consistency with other scenarios of waste management b. Conventional average technologies and practices c. Specification and justification of end-of-waste state where applicable d. If applicable (module D): Selecting substituted processes in accordance with the PCR or (if no PCR is available) representative actual processes e. If applicable (substitution in Module D): Calculation of net flows f. Conservative approach, i.e. choice of those scenarios and calculation rules that reflect the highest environmental impacts in comparison to other choices	M	§6.4.3.3 and applicable PCR	§6.4.3.3 and applicable PCR	
13.8	Is there any presentation or expert guess of data sets which do not comply with the allocation principles and description of consequences for the LCA results?	M	Applicable PCR	Applicable PCR	
14	**General information - availability**	**M/O***	**Ref. A1**	**Ref. A2**	**C & A**
14.1	Transparent presentation of Life Cycle Assessment modeling (for example by tables, screenshots from Life Cycle Assessment software programs etc.)	M	§8.4	§8.4	
14.2	Clear description how company data are used in which data records in Life Cycle Assessment software programs	M	§8.4	§8.4	
14.3	Assignment of process data to the Life Cycle Assessment modules	M	§8.4	§8.4	
14.4	For several locations/products: Presentation of modeling of all locations and products as well as weighting thereof	M			
14.5	Plausibility and consistency of data (mass balance, energy balance) Balances on company level and in the life cycle. e.g. Mass balance between reference flow and wastes for cradle to grave data / Mass of non-	M	§8.4	§8.4	

	energetic resources used coherent with the reference flow / CO and CO2 emissions coherent with the mass of fossil energetic resources / check of the sum of non-renewable and renewable parts or between feedstock and fuel parts / Is the energy indicators coherent with the energetic resources used?				
15	**General information - availability**	**M/ O***	**Ref. A1**	**Ref. A2**	**C & A**
15.1	Presentation of the parameters in tabular form for all modules A1 to D Marking unassessed modules as "MNA" (= module not assessed)	M	§7.2.2 EN15978 ch.12.5	§7.2.2 EN15978, §12.5	
15.2	Presentation of the parameters describing environmental impact (7 parameters), the parameters for describing the use of resources (10 parameters), parameters for describing the waste categories (3 parameters) and parameters concerning output material flows (4 parameters)	M	§6.5, §7.2.3 – §7.2.5	§6.5, §7.2.3 – §7.2.5	
15.3	Selection of correct characterization factors and elimination of long-term emissions (> 100 years)	M	§8.2 and annex (amendment) and applicable PCR	§8.2 and annex C.4 and applicable PCR	
15.4	Justification of characterisation factors applied in case of input/output flows that are not on the list of characterisation factors of the EN15804 and applicable PCR	M			
15.5	Information on the environmental impacts in the project report: a. Reference to characterisation models and factors b. Statement that the estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks	M	§8.2	§8.2	
16	**General information - availability**	**M/O***	**Ref. A1**	**Ref. A2**	**C & A**
16.1	Interpretation of the results based on a dominance/contribution analysis of selected indicators	O			
16.2	Relationship between the results of the Life Cycle Inventory Assessment and the results of the Life Cycle Impact Assessment (LCIA)	M	§8.2	§8.2	
16.3	Assumptions and restrictions as regards the interpretation of results in the EPD, in terms of both methods and data	M	§8.2	§8.2	
16.4	Variance from the means of LCIA results must be presented if generic data is provided from several sources or [the results] refer to a number of similar products.	M	§8.2	§8.2	
16.5	Data quality assessment	M	§8.2 ISO 14040 CEN TR15941 Applicable PCR	§8.2 ISO 14040 CEN TR15941 Applicable PCR	
16.6	Comprehensive transparency as regards value decisions, justifications and expert opinions	M	§8.2	§8.2	
17	**General information - availability**	**M/O***	**Ref. A1**	**Ref. A2**	**C & A**
17.1	Where relevant to check the documentation:	M	§8.3	§8.3	

	a. Laboratory results/measurements listed in the content declaration b. Laboratory results/measurements listed inthe functional/technical performance c. Documentation on the declared technical information on individual life cycle stages not taken into consideration in the construction product's Life Cycle Assessment and applied for evaluation of the building (e.g. transport routes, energy consumption during the usage stage, cleaning cycles etc.) d. Laboratory results/measurements pertaining to the declared emissions in indoor air, soil or water during the use stage				
17.2	Where relevant: ensure that information additional to EN15804 is verified				
18	**General information - availability**	**M/O***	**Ref. A1**	**Ref. A2**	**C & A**
18.1	Necessary if the entire life cycle A1-C4 is declared: Documentation for calculating the reference service life (RSL), should be representative for the declared product	M	§6.3.3	§6.3.4	

* **M = Mandatory, O = optional**

C. Checklist part B: Requirements on the MRPI®-EPD certificate

In principle there are 4 types of MRPI®-EPD the manufacturer can choose. These are described in detail in section 2.3. The verification for all types certificates is essentially the same. For the MRPI®-EPD certificate for the Dutch market also the toxicity indicators must be verified.
The whole section is mandatory to verify. The rules for the EPD format can be found in the EN 15804 §7 and EN 15942: everything that is included in the master ITM (information transfer matrix), should somewhere be documented in the EPD. Additional information in the EPD shall be verified too.

1	Formal requirements	Ref. A1	Ref. A2	C & A
1.1	General, EPD includes: a. text “Environmental Product Declaration in accordance with ISO 14025 and EN 15804” b. Statement that “EPD of construction products may not be comparable if they do not comply with EN15804” c. Publisher / Program Operator, name, address d. Name of declared product e. Declaration owner / Name and address of manufacturer/association f. Representativeness of geographical area g. Representativeness with regard to which manufacturer(s) h. Program logo and website i. Date of issue + validity (5 years) j. Variability for average declaration k. Product composition l. Stages omitted, if not full LCA m. Declaration of material content of SVHC that are listed on the "Candidate List of Substances of Very High Concern for authorisation" when their content exceeds the limits for registration with the European chemicals Agency.	§7.1	§7.1	
1.2	PCR name PCR version (MM YYYY)	Applicable PCR	Applicable PCR	
1.3	Demonstration of verification: external[6] independent verification, name of third party verifier	§7.1, Table 2	§7.1, Table 2	
1.4	Information on the validity corresponds with the specifications in the project report			
2.	**Product**	**Ref. A1**	Ref. A2	**C & A**
2.1	The product description is in line with the project report and the product studied, and clear enough described in the EPD to understand what product is declared			
2.2	If applicable: Explanations on calculations of averages within a product group	§7.1	§7.1	
2.3	Specification / identification (picture, name, model)	§7.1	§7.1	
2.4	Indication of the intended use	§7.1	§7.1	
2.5	Relevant technical data (additional information is possible) including RSL if applicable			
2.6	The test standards to which the technical data are referred to.			

[6] *EN15804 ch.7.2 Table 2 mentions the possibility of internal or external verification. In the ECO Platform external verification is preferred and advised*

2.7	A description of the main product components and or materials is provided in accordance with the specifications of the PCR (if available) and LCA project report. As a minimum substances that are listed in the latest "Candidate List of Substances of Very High Concern for authorisation" if their content exceeds the limits for registration.	§7.1	§7.1	
2.8	Description of the manufacturing process / all manufacturing processes if several locations are involved	§7.1	§7.1	
3	**LCA rules**	**Ref. A1**	Ref. A2	**C & A**
3.1	Information on the declared / functional unit corresponds with the specifications of the PCR (if available)	Applicable PCR	Applicable PCR	
3.2	Indication of the EPD type (cradle-to-gate, cradle-to-gate with options, cradle-to-grave)	§7.2.2	§7.2.2	
3.3	EPD contains a (simple) flow diagram in accordance with the modular approach	§7.2.1	§7.2.1	
3.4	Description of the system boundary (can be simplified, as a picture or in wording) Presentation of assignment of the analysed processes to the life cycle modules			
3.5	Indication of the key assumptions and estimates for interpretation which are not depicted elsewhere in the EPD			
3.6	Presentation of the application of cut-off criteria in accordance with the project report			
3.7	Source of background data used			
3.8	Indication of the age of background data used			
3.9	Information on the data collection period and resulting averages			
3.10	Presentation of the allocations of relevance for calculation in accordance with the minimum requirements of the PCR			
4	**LCA: Scenarios and additional technical information**	**Ref. A1**	Ref. A2	**C & A**
4.1	Mandatory for all declared modules > A3: Presentation of the assumptions pertaining to the scenarios of the declared modules in accordance with the project report. Information on undeclared modules is optional.	§7.3	§7.3	
4.2	If a reference service life is declared in the EPD, presentation of the scenario on which the RSL is based, in accordance with the project report	§7.3.3.2	§7.3.3.2	
5	**LCA: Results**	**Ref. A1**	Ref. A2	**C & A**
5.1	Description of the declared / functional unit			
5.2	Identification of the declared/undeclared modules MNA = module not assessed			
5.3	Full declaration of all indicators required according to the modular approach ND = Not Declared	§7.2.3, §7.2.4, §7.2.5 and §7.5	§7.2.3, §7.2.4, §7.2.5 and §7.5	
5.4	Compliance of the declared values with the information in the project report			
5.5	In case of product averages: description of the range / variability of the LCIA results	§7.1	§7.1	

5.6	Deletion of module columns which are not declared (permissible for the *Results part*) if program allows	Program Operator rules	Program Operator rules	
5.7	Formatting the table framework and parameter addressed in accordance with the specifications of the PCR or the Program Operator rules			
6	**Evidence for tests or certificates**	**Ref. A1**	Ref. A2	**C & A**
6.1	Additional information is provided to indoor air or soil/water, if applicable	§7.4	§7.4	
6.2	Declaration of the relevant evidence. Information where to find this evidence	§7.2 and applicable PCR, existing program rules	§7.2 and applicable PCR, existing program rules	
7	**References**	**Ref. A1**	Ref. A2	**C & A**
7.1	Full indication of all referenced sources (excluding standards already quoted in full and standards concerning evidence)			

D. Example of dialogue between verifier LCA practitioner during the verification process

Any deviations from the requirements should be reported by the verifier, and the dialogue between verifier and LCA practitioner should be made transparent as well improvements made following the verification process. This can be done separate from the checklist. The format to do so is free to choose. Examples are given below:

Example:

Issue number	Question / comment	response

Example (partly based on XP TS14071)

Comment N°	Chapter Article Paragraph	Alinea Table	Type of comment (Ed, Te, Ge)*	Ref. to a Eco check list	Verifier comment and recommendation	EPD owner / LCA practitioner answer	Final verifier statement

*Ed = Editorial

*Te = Technical

*Ge = General