

# European Aluminium General Programme Instructions

Version 3

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78	<b>Acronyms</b>
79	<b>c-PCR:</b> complementary Product Category Rules
80	<b>BIM:</b> Building Information Modelling
81	<b>EPD:</b> Environmental Product Declaration
82	<b>IGU:</b> Insulating Glass Unit
83	<b>LCA:</b> Life Cycle Assessment
84	<b>PCR:</b> Product Category Rules
85	<b>RSL:</b> Reference Service Life
86	

## **Definitions**

**Only aluminium-specific definitions and critical definitions are reported in this document. For the definitions not included in this list, please refer to E15804:2019.**

**Aggregated data:** data based on a representative sample for a construction product or construction service, referring either to multiple plants or based on multiple similar construction products of the same plant(s).

**Declared unit:** is the quantity of a construction product for use as a reference unit in an EPD for an environmental declaration based on one or more information modules (from EN15804:2019)

**Functional unit:** is a quantified performance of a product system for use as a reference unit (from EN15804:2019)

**Primary data:** quantified value of a unit process or an activity obtained from a direct measurement or a calculation based on direct measurements at its original source. (Definition from ISO 21930:2017)

**Secondary data:** indirectly measured, calculated or obtained quantified value of a unit process or activity and related information within a product system (ISO 14040:2006, 3.28) or organization, not based on specific original source measurements. (Definition from ISO 21930:2017)

**Specific data:** data representative of a construction product or construction service, provided by one supplier, either from multiple plants or based on multiple similar construction products of the supplier. (Definition from ISO 21930:2017)

## **Aluminium specific definitions**

**Aluminium scrap:** waste or secondary materials mostly composed of metallic aluminium. The definition of end-of-waste state for aluminium scrap shall refer to the Council Regulation (EU) No 333/2011 of 31 March 2011 or its potential update establishing criteria determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC of the European Parliament and of the Council. Aluminium scrap is split into 2 main categories: pre-consumer scrap and post-consumer scrap.

**Pre-consumer aluminium scrap:** The pre-consumer aluminium scrap is generated along the production chain of aluminium products; it includes the scrap that is produced along the production chain of the product(s) object of the EPD and the scrap that is produced along the production chain of other aluminium products.

**Post-consumer aluminium scrap:** The post-consumer aluminium scrap is generated at the end of life stage of aluminium products within Module C.

## **1. Introduction**

This document constitutes the General Programme Instructions of the EPD Programme of European Aluminium. It constitutes the basis of the administration, organization and methodological choices of the EPD Programme of European Aluminium for Type III environmental declarations according to ISO 14025:2010 and developed according to EN15804:2019.

This document also includes some specific methodological requirements for the development of EPDs, particularly concerning EPDs for aluminium windows and doors, curtain walls, profiles, sheets and composite panels as additional complementary Product Category Rules (PCR).

## 2. Scope and objectives of the programme

The EPD Programme of European Aluminium supports the development and publication of Type III Environmental Product Declarations (EPDs) for building products containing aluminium as one of the main raw materials.

The Programme is developed applying the requirements of the following European and International standards:

- ISO 14025:2010 – Environmental labels – Declarations – Type III Environmental Declarations – Principles and procedures.
- ISO/TS 14027:2017 – Environmental labels and declarations — Development of product category rules
- ISO 14040:2006 – Environmental management – Life cycle assessment – Principles and framework
- ISO 14044:2006/AMD 1:2017 – Environmental management — Life cycle assessment — Requirements and guidelines — Amendment 1
- EN 15804:2019 – Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- ISO 21930:2017 – Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services.

The scope of the EPD Programme of European Aluminium is limited to building products and intermediate building products i) containing aluminium as one of the main raw materials or where aluminium contributes to a key property, e.g. structural or protective aspects and ii) it is restricted to the members of European Aluminium. Exceptions to rule ii) may be granted on ad hoc basis after presentation of a formal request to the Programme Operator, that reserves the right to accept or deny such a request.

A non-exhaustive list of building products covered by the scope of the EPD Programme of European Aluminium includes:

- Aluminium windows and doors
- Aluminium curtain walls
- Aluminium composite panels

A non-exhaustive list of intermediate building products covered by the scope of the EPD Programme of European Aluminium includes:

- Aluminium profiles
- Aluminium sheets (mill finished, coated, anodised, formed)

The resulting EPDs are addressing business-to-business communication, however their use for business-to-consumer communication is not prohibited.

Claims elaborated by companies for communication and marketing purposes are the sole responsibility of the company owning the EPD and they should ensure the compliance of the claims with laws and regulations in place in the relevant geographical area.

The official language of the EPD Programme of European Aluminium is English. A summary of the EPD may be provided in other languages, however such a summary shall always refer to the original EPD in English.

### 3. Programme organisation and roles

The organisation of the EPD Programme of European Aluminium is described in the following paragraphs and it is schematised in Figure 1.

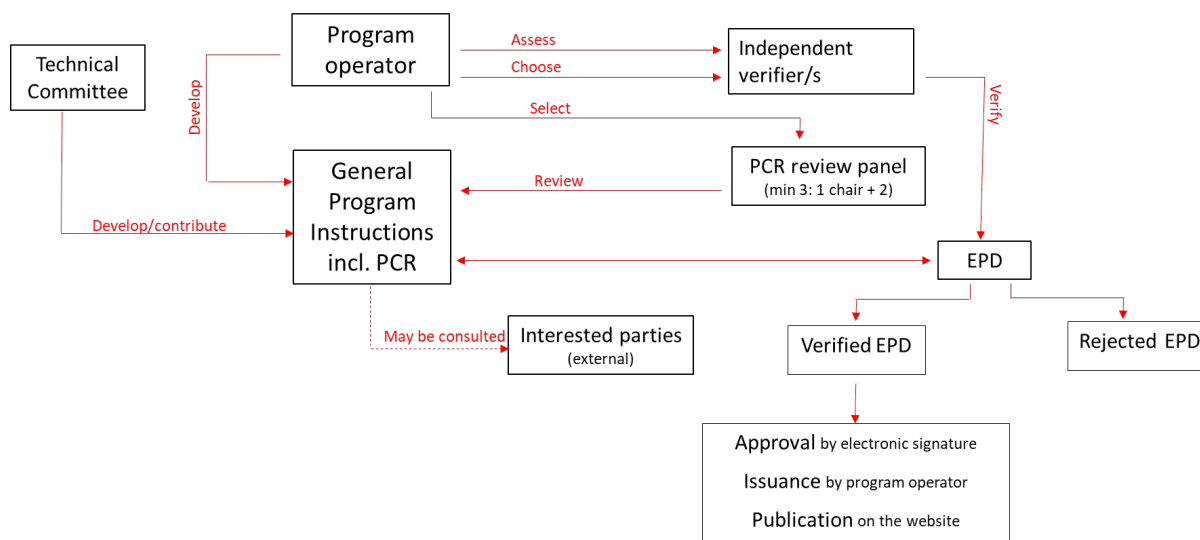


Figure 1 Scheme of the EPD Programme of European Aluminium.

#### 3.1 Programme Operator

The Programme Operator is European Aluminium.

The Programme Operator is responsible for the general administration of the EPD Programme and, in particular, its tasks are those described in section 6.3 of ISO 14025:2010, i.e.

1. preparing, maintaining and communicating general programme instructions;
2. ensuring that the rules and requirements included in this document are always applied;
3. maintaining publicly available lists and records of PCR documents and Type III environmental declarations within the programme;
4. publishing PCR documents and valid Type III environmental declarations within the programme;
5. monitoring changes in procedures and documents of related Type III environmental declaration programmes and revising procedures and documents when necessary;
6. ensuring the selection of competent of independent verifiers and PCR review panel members (see also the tasks 9, 10 & 12);
7. establishing a transparent procedure for the PCR review, including the scope of the review, detail of the review and how the PCR review panel is constituted;
8. establishing procedures to avoid misuse of references to ISO 14025:2010, the Type III environmental declaration programme and, where relevant, its logo.

In addition to these tasks, the Programme Operator:

9. Secures that the qualifications and expertise of the verifiers are in line with the requirements of these General Programme Instructions
10. Appoints the third party verifier for the verification of the EPD and the approval of the LCA-tool for EPD.
11. Sets up and invites the Technical Committee for the development and update of PCR
12. Sets up and invites the Review Panel
13. Officially approves and issues the verified EPD for inclusion in tasks 3 and 4

### **3.2 Technical Committee**

The role of the Technical Committee is to contribute to the drafting of the General Programme Instructions, including the rules for specific products as described in section 5 of this document. The Technical Committee is involved in the drafting of PCR for aluminium products and intermediates other than windows and doors, curtain walling, aluminium sheets and aluminium composite panels.

The Technical Committee is composed by maximum 20 experts belonging to the following groups:

- Experts from European Aluminium secretariat
- A minimum of five external experts, i.e. not belonging to European Aluminium secretariat

The Technical Committee should nominate one expert as “Chair of the Technical Committee”, who should lead the activities of the Committee.

### **3.3 PCR Review Panel**

The PCR Review Panel is composed by at least three (3) independent and external third-party experts: two experts as members and one expert acting as chair of the PCR Review Panel.

The Chair of the PCR Review Panel is selected by the Programme Operator. The other experts of the PCR Review Panel are selected by the Programme Operator in agreement with the Chair of the PCR Review Panel.

The experts shall not be involved in the development of the PCR and General Programme Instructions and not be exposed to conflicts of interest based on their professional activities.

The roles of the PCR Review Panel are to:

- Review the General Programme Instructions
- Review the complementary PCR
- Address the comments formulated by interested parties during the open consultation, when organised, and include them in the review statement

The PCR Review Panel is led by a Chair. His/Her tasks are to:

- Provide the General Programme Instructions and the PCR(s), if developed, to the PCR Review Panel, possibly with a preliminary review statement;
- Coordinate the activities of the PCR Review Panel;
- Coordinate and consolidate the review statements expressed by the various members of the PCR Review Panel;
- Interact with the Programme Operator and the Technical Committee when needed;
- Draft the review statement which shall be agreed by each member of the PCR Review Panel;



- 233 - If requested by a member of the PCR Review Panel, the Chair shall also collect the comments  
234 of the PCR Review Panel and should include them as annex to the final review statement;  
235 - Verify and secure the respect of the open consultation process and procedure by the  
236 Programme Operator.

237 The Programme Operator may cover operating costs previously approved (e.g. travel costs) directly  
238 imputable to the participation in the PCR Review Panel.

239 The combined competencies of the PCR Review Panel should include:

- 240 - General background knowledge of the building sector, building products and product-related  
241 environmental aspects  
242 - Expertise in LCA and methodology for LCA work  
243 - Knowledge of relevant standards in the fields of environmental labelling, declarations and LCA  
244 - knowledge of the European mandatory and voluntary legislative framework concerning  
245 environmental labelling of products, green claims and, more in general, sustainability of  
246 products and services  
247 - Professional knowledge of the English language

248 The Programme Operator is responsible for checking that the PCR Review Panel complies with the  
249 requirements on the combined competencies analysing the curricula vitae of the individual experts.

### 250 **3.4 Interested parties**

251 Interested parties are those stakeholders invited to provide feedback on the draft General Programme  
252 Instructions and PCR(s), if developed, during the open consultation. Their role is to read and provide  
253 comments on draft document during the open consultation phase.

254 The Programme Operator is responsible for inviting the interested parties and facilitating their  
255 participation via an open consultation.

256 The open consultation can be organised via electronic media (e.g. web, web-meetings, emails) and  
257 should take place:

- 258 - When the scope of the Programme is amended  
259 - When a new category of products is added to the General Programme Instructions or when a  
260 new PCR covering a new category of products is developed.

261 The open consultation may take place when the General Programme Instructions and/or the PCR are  
262 updated. If it is the case, the Review Panel shall inform the Programme Operator if it deems that the  
263 scope of the update requires an open consultation to be organised.

264 The review statement regarding this open consultation requirement shall be included in the review  
265 report. The Review Panel shall address the comments received during the public consultation in its  
266 review statements and its final version of the document.

## 267 **4. Programme administration**

### 268 **4.1 Data confidentiality management**

269 The EPD is intended to be public and as such, data and information included in the EPD are not to be  
270 considered as confidential.

271 However, for the registration of the EPD, the EPD Programme Operator has access to the LCA project  
272 report and, potentially, to other confidential information. These documents and all the data and

273 information there included shall be considered as confidential and treated with the outmost care and  
274 respect by the Programme Operator. These documents shall not be shared with third parties, unless  
275 authorised by the company owning the EPD.

276 The verifier of the EPD has also access to the LCA project report and the information there included.  
277 Being the information there included confidential, the verifier shall use the outmost care and respect  
278 when handling these documents and shall not share them with third parties, unless authorised by the  
279 company. The verifier may be asked to sign a Non Disclosure Agreement (NDA).

## 280 **4.2 General Programme Instructions**

281 The Programme Operator shall prepare and maintain the General Programme Instructions and ensure  
282 that they are followed by all the actors involved.

283

## 284 **4.3 Process for the review of the General Programme Instructions**

285 The Programme Operator shall decide, based on the evolutions in the market and in the LCA  
286 methodology (see Section 5), when the General Programme Instructions shall be updated.

287 At minimum, the General Programme Instructions should be reviewed every five years. Beyond five  
288 years, an assessment shall be performed every two years to decide on the revision or not of the  
289 General Programme Instructions. The absence of a revision after 5 years should be justified and  
290 validated by the Chair of the PCR Review panel.

291 When the General Programme Instructions are revised, a new draft is prepared by the Programme  
292 Operator (European Aluminium) in consultation with the Technical Committee.

293 Such draft is submitted for consideration to the PRC Review Panel through the Chairman of the PCR  
294 Review panel. The PCR Review panel is then invited to read and comment the document. Such  
295 comments will be consolidated by the Chairman of the PCR Review Panel and sent to the Programme  
296 Operator.

297 The Programme Operator will provide an answer to each comment received, changing the content in  
298 the General Programme Instructions accordingly when deemed adequate. The Programme Operator  
299 is not obliged to accept every comment, however it shall provide an answer to them and a justification  
300 for rejection, if any.

301 Once a revised document is available taking into consideration the comments of the PCR Review Panel,  
302 the document and the reply to all the comments are submitted again to the PCR Review Panel.

303 This iterative process will end when the PCR Review Panel won't have anymore critical concern. At the  
304 end of the process, the Chairman of the PCR Review Panel will release a review statement, that may  
305 also include some final considerations.

## 306 **4.4 Website**

307 The page of the EPD Programme of European Aluminium is available on the European Aluminium  
308 website at: [www.european-aluminium.eu](http://www.european-aluminium.eu).

309 The Programme Operator shall keep this website up-to-date and shall include at least:

- 310 - The latest version of the General Programme Instructions
- 311 - The latest version of the PCR(s)

- 312 - The list of all valid EPDs registered, including the link to access the EPDs
- 313 - The list of expired EPDs (in a separate section), without the link to access the EPDs. These EPDs
- 314 will only be available upon request submitted to [epd@european-aluminium.eu](mailto:epd@european-aluminium.eu)
- 315 - The list of approved LCA-tools for EPD

316 All the public documents and information mentioned above shall be available for free to all interested  
317 stakeholders, e.g. architects, public administrations, buildings owners, research institutes.

318 In case of doubts concerning the validity or the content of EPDs published within the European  
319 Aluminium EPD Programme, the website of European Aluminium constitutes the only source of official  
320 information and include the EPDs, if in their validity period, in the version that has been approved by  
321 the verifier.

#### 322 **4.5 Avoiding misuse**

323 The general legal requirements in Belgian legislation for the protection of rights on intellectual  
324 property apply.

#### 325 **4.6 Monitoring changes in relation to new standards**

326 Once new or updated ISO and/or EN standards affecting the General Programme Instructions and the  
327 EPD of building products are published, the Programme Operator shall organise an update of the  
328 General Programme Instructions to align the EPD Programme to these new standards.

#### 329 **4.7 Fees**

330 The fees for the verification of EPDs and the approval of the LCA-tool for EPD are calculated on ad hoc  
331 basis considering the high variation of products and EPD types and associated verification efforts.

332 The fees and rules for registering one or more verified EPD shall be published by the Programme  
333 Operator on the website.

334

#### 335 **4.8 Further information**

336 For any further information please contact the Programme Operator at: [epd@european-](mailto:epd@european-aluminium.eu)  
337 [aluminium.eu](mailto:epd@european-aluminium.eu).

### 338 **5. Complementary Product Category Rules**

339 The EPD Programme of European Aluminium aims at facilitating the development of EPDs for  
340 aluminium building products in Europe by using a European approach. Many manufacturers of  
341 aluminium building products in fact operate several plants located in various European countries while  
342 their aluminium material supply usually comes from variable origins within or outside Europe. For  
343 these reasons, in most cases, a European approach is the most relevant for developing EPD on  
344 aluminium building products used in Europe.

345 This section describes the Complementary Product Category Rules (c-PCR) in the European  
346 Aluminium EPD Programme and it is divided in two sections:

- 347 i. Complementary Product Category Rules applicable to all building products in the scope
- 348 ii. Complementary Product Category Rules applicable to specific products

While the methodology described in i) shall be applied for every type of product for which an EPD is realised and/or registered under the European Aluminium EPD Programme, the requirements listed in ii) are only applicable for specific types of products, namely:

- Windows and doors
- Curtain walling
- Aluminium sheets (mill finished, anodised, coated, formed)
- Composite panels

## **5.1 Complementary Product Category Rules for all building products in the scope**

This section describes the c-PCR in the European Aluminium EPD Programme and sets some of the pre-conditions for the application of LCA in EPDs to increase comparability and consistency between products in the same product categories. The c-PCR described in this section shall be complemented by specific rules that are described in the next section for windows and doors, curtain walling, composite panels, aluminium sheets.

### **5.1.1 General**

- All the PCR and EPDs under this EPD Programme shall be in compliance with EN 15804:2019. Average data<sup>1</sup> and scenario reflecting current practices shall be used for the modelling.
- The complementary Product Category Rules developed by product-related CEN Technical Committees shall be respected, e.g. EN17213:2020 for windows and doors.
- All the EPDs shall cover at least the mandatory modules A1-A3, C1-C4 and module D.
- The most updated inventory data published by European Aluminium should be used for modelling primary aluminium, aluminium refining, aluminium remelting, rolling and extrusion as specified in Section 5.1.3, unless primary data of appropriate quality more representative from the time, technological and geographical representativeness are available.
- The cut-off rules as described in EN 15804:2019 apply.
- The life cycle inventory shall not include benefits from CO<sub>2</sub> certificates to offset carbon emissions, since CO<sub>2</sub> certificates are political measures for balancing greenhouse gas emissions which have no correlation with the manufacturing process itself.
- The results of sensitivity analysis may be reported in the EPD in the section "interpretation" as defined in the EPD template reported in Annex 03.

### **5.1.2 Functional unit/Declared unit**

- According to EN15804:2019, the functional unit is a quantified performance of a product system for use as a reference unit, whereas the declared unit is the quantity of a construction product for use as a reference unit in an EPD for an environmental declaration based on one or more information modules.
- In the case of the main aluminium products included in the scope of this Programme, the declared unit shall be used instead of the functional unit (The declared unit to be used for the main aluminium products included in the scope of this Programme is reported in Section 5.2.1-5.2.4.).
- When the intended use of the building products is known, the functional unit may also be defined at building level, especially when customised products are used to satisfy specific requirements defined at building level. This is usually the case for windows, and curtain walls

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<sup>1</sup> If ecoinvent is used for the modelling, then the system model "Allocation, cut-off by classification", or cut-off system model in short, shall be used. These datasets are modelled based on the Recycled Content, or Cut-off, approach. Further information available at [www.ecoinvent.org](http://www.ecoinvent.org).

which are designed according to requirements defined at building level. In these cases, one consolidated EPD may be developed for covering a set of products used within a well-defined building project. In this case, a clear description and inventory of the various building products covered by the consolidated EPD shall be provided in the functional unit section as described in Annex 02. When the EPD relates to several products, the EPD shall describe the full set of products satisfying the functional unit defined at building level.

- When the product of the EPD is described, the following information shall also be included: i) The name and type of product (semi-finished, building element, finished) are stated; and ii) Identification of product by product standard or technical approval.

### **5.1.3 Data quality**

The data quality of the primary and secondary data used shall be evaluated following EN15804:2019, considering the criteria for time, geographical and technological representativeness.

Primary data shall refer to no more than 3 years before the date in which the EPD is calculated. Primary data shall be as current as possible. A justification shall be provided if the data used do not refer to the latest year for which one full year of data are available.

Example: The EPD is realised in June 2021. The primary data to be used should refer to the year 2020 (in principle this is the latest year for which a full year of data are available). According to this Programme Rules, data referring to 2019 and 2018 are also acceptable, however if these data are used a justification shall be provided.

Primary data should be based on one-year aggregated data; deviations shall be justified. Examples of situations in which the timeframe for the data collection may be different are when an EPD for new products is realised (for example, products that are on the market for less than one year).

The representativeness shall be evaluated also in case a sampling is performed, and the sampling method shall be documented in the LCA report.

In the case primary data are collected from different production sites for the same company or from a multitude of different production sites for several companies, the aggregation procedures applied shall be transparently reported in the LCA report and shall be verified by the verifier. Secondary datasets used for calculations shall be representative for the current year and used during their period of validity. The validity of datasets is reported in the accompanying documentation.

### **5.1.4 Aluminium modelling**

For the modelling of primary aluminium, extrusion, rolling, refining and remelting of aluminium the latest and most updated datasets developed by European Aluminium should be used<sup>2</sup>. All the details about the modelling of these datasets are reported in the Environmental Profile Report, freely accessible to registered users on the European Aluminium website together with the datasets themselves.

If company specific data for the modelling of primary aluminium, extrusion, rolling, refining and remelting processes of appropriate quality are available, they should be used instead of the average

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<sup>2</sup> At the time of publication of this General Programme Instructions, the most updated datasets are those published in the Environmental Profile Report in 2018, referring to data collected in 2015.

data developed by European Aluminium. In this case, the rules listed in section 5.1.6 should be followed, any deviation from these rules shall be justified in the LCA report.

Company specific data for the modelling of primary aluminium, extrusion, rolling, refining and remelting can be used i) if such processes are performed by the company owning the EPD; or ii) if a stable commercial relationship between the owner of the EPD and the supplying companies performing one or more of the processes among primary aluminium, extrusion, rolling, refining and remelting can be demonstrated.

If option ii) is implemented, a change in the suppliers shall be considered as a major technological change that may affect the environmental results reported in the EPD. For this reason, the company owning the EPD shall promptly inform the Programme Operator of such variation if it happens in the 5 years of validity of the EPD, so that the procedures described in Section 7.4 will be activated.

Note: those datasets are implemented in the professional Gabi database and full documentation is available on the European Aluminium website ([www.european-aluminium.eu](http://www.european-aluminium.eu)). In case of doubts, please contact: [epd@european-aluminium.eu](mailto:epd@european-aluminium.eu).

### 5.1.5 End of waste status of aluminium scrap

Aluminium scrap is classified in 2 main categories:

- The post-consumer scrap is generated at the end of life stage of aluminium products within Module C.
- The pre-consumer scrap is generated along the production chain of aluminium products; it refers to the scrap that is produced along the production chain of the product object of the EPD or the scrap that is produced along the production chain of other aluminium products.
- The scrap which are produced along the production chain of the product object of the EPD are usually recycled into the same production chain and should be modelled as “closed loop” within Module A. Such scrap quantity does not contribute to the recycled content of the product
- the definition of end-of-waste state for aluminium scrap shall refer to the COUNCIL REGULATION (EU) No 333/2011 of 31 March 2011 or its potential update establishing criteria determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC of the European Parliament and of the Council.
- The main conditions for aluminium scrap to reach the end-of-waste status are:
  - The total amount of foreign materials shall be  $\leq 5$  % by weight
  - The scrap shall not contain polyvinyl chloride (PVC) in form of coatings, paints, plastics.
  - The scrap shall be free of visible oil, oily emulsions, lubricants or grease except negligible amounts that will not lead to any dripping
  - The scrap shall not display any of the hazardous properties listed in Annex III to Directive 2008/98/EC.
- Provided these conditions of end-of-waste status are fulfilled, aluminium scrap can then be considered as secondary materials and may exit the product system boundaries as secondary material.

The treatment of pre-consumer scraps is dealt as ISO 14044 recommends and in line with the alternative approach provided by EN 15804, instead of the default approach proposed of co-product allocation. According to definition 3.30, pre- and post- consumer scrap are considered as secondary materials. According to EN15804, they both enter module A free of burdens (i.e. no transfer of burdens

from the previous system). Hence, such choice has been governed for keeping consistency with the treatment of post-consumer scrap and to avoid the risk that the impacts eventually allocated to pre-consumer scrap exiting Module A cannot be accounted for at the entry point of another product system.

#### 5.1.6 Modelling of modules A1-A3

- The supply structure of the various materials reported in the bill of materials of the product shall be documented and justified and all the respective production, recycling and manufacturing processes shall be described and considered accordingly under Modules A1-A3.
- Aluminium scrap produced along the production chain is generally directly recycled within the product system through a “closed loop” within Module A. The LCA modelling should consider the appropriate processing step and/or datasets in order to reflect such “closed loop” approach. If such “closed loop” modelling is not applicable for specific aluminium scrap, it shall be explicitly stated and those scrap shall be modelled using an open loop approach. In this exceptional case, the aluminium scrap shall leave the system without any burden or benefit. In this case, no burdens are allocated across the system boundary with secondary material, secondary fuel or recovered energy flows arising from waste. See Case 1 for closed loop modelling and Case 2 for open loop modelling of aluminium scrap coming from the value chain. The same approach shall be used for the energy flows generated within the modules A1-A3.
- The remelting process of the total amount of scrap is included in Mod. A1-A3. The losses during the remelting process shall be taken into consideration in the calculations and primary aluminium shall be used to compensate the losses occurred during the remelting process.
- The treatment of waste flows generated along the production chain shall be modelled within the module where the waste is produced.
- The European energy mix should be preferably used for the modelling of the electricity used for primary aluminium, rolling, extrusion, refining and remelting whenever the aluminium for the product object of the EPD is bought on the EU market and potentially more than one supplier for each production stage are involved and this cannot be tracked.
- If the specific electricity mix is used, than the specific electricity mix as generated, or purchased, from an electricity supplier, demonstrated by a Guarantee of Origin (or similar, where reliability, traceability, and the avoidance of double-counting are ensured) as provided by the electricity supplier should be used<sup>3</sup>. A change in the energy mix composition shall be considered as a major technological change that may affect the environmental results reported in the EPD. For this reason, the company owing the EPD shall promptly inform the Programme Operator of such variation if it happens in the 5 years of validity of the EPD, so that the procedures described in Section 7.4 will be activated.

#### Case 1 – modelling of aluminium scrap in closed loop

In Figure 2 the modelling of aluminium scrap coming from the value chain in closed loop has been reported.

- Pre-consumer aluminium scrap generated along the production chain is modelled in closed loop within the product system, i.e. it never crosses the system boundary. That means that

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<sup>3</sup> It is suggested to the company purchasing electricity with a Guarantee of Origin to verify that the electricity mix purchased corresponds to the electricity mix actually bought.

aluminium scrap is assumed to be recycled in the same product system in which is generated (referring to Figure 2, the aluminium scrap modelled in closed loop are the 0.3 kg generated from the extrusion and the 0.05 kg generated at the final fabrication stage).

- The pre-consumer aluminium scrap modelled in closed loop does not contribute to the calculation of the net amount to be considered in Module D. Referring to the numbers in Figure 2 - Module D =  $(0.95 - 0.4) * (I_{rec} - I_{primary})$ , where  $I_{rec}$ =impact of the remelting or refining process; and  $I_{primary}$ =is the impact of the production of primary aluminium.
- The aluminium scrap entering the system can be pre-consumer or post-consumer and does not have any impact or benefit coming from the previous product system. It however bears the impacts due to transportation and preparation of the scraps before smelting.
- The recycled content is 40%, calculated as  $0.4 / (0.6 + 0.4)$  and the metal input to be considered in Module A is 1 kg.

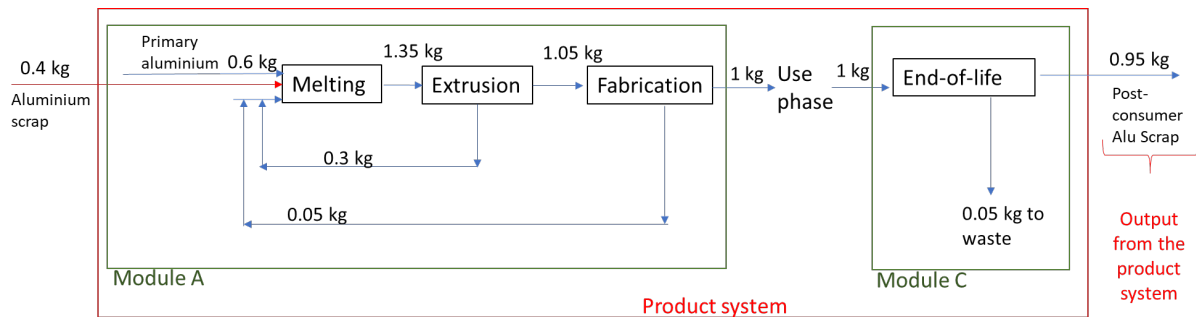


Figure 2. Example of closed loop modelling for 1 kg of aluminium profile used in the final product. **Note to the Figure:** in the example reported in the figure the process losses within the value chain (for example due to oxidation in the melting) are not included to facilitate the understanding. However, such losses shall always be included in real calculations.

## Case 2 – modelling of aluminium scrap in open loop

In Figure 3 the modelling of aluminium scrap coming from the production chain in open loop has been reported.

- Pre-consumer aluminium scrap generated along the production chain is usually modelled in closed loop within the product system, i.e. it never crosses the system boundary. That means that aluminium scrap is assumed to be recycled in the same product system in which is generated. In the few cases in which this won't be realistic, the aluminium scrap is modelled in open loop.
- The pre-consumer aluminium scrap modelled in open loop leaves the product system and crosses the system boundary to be used in other product systems (referring to Figure 3, the aluminium scrap modelled in open loop is the 0.3 kg generated from the extrusion and the 0.05 kg generated at the final fabrication stage).
- The aluminium scrap modelled in open loop contributes to the calculation of the net amount to be considered in Module D. Referring to the numbers in Figure 3 - Module D =  $(0.95 + 0.3 + 0.05 - 0.54) * (I_{rec} - I_{primary})$ , where  $I_{rec}$ =impact of the remelting or refining process; and  $I_{primary}$ =is the impact of the production of primary aluminium.
- The aluminium scrap entering the system can be pre-consumer or post-consumer and does not have any impact or benefit coming from the previous product system. It however bears the impacts due to transportation and preparation of the scraps before smelting.
- The aluminium scrap modelled in open loop leaving the system (0.3 kg and 0.05 kg in Figure 3) does not have any impact or benefit coming from the product system. This ensures the consistency with the previous bullet point.



- The recycled content is 40%, calculated as  $0.54/(0.81+0.54)$  and the metal input to be considered in module A is 1.35 kg.

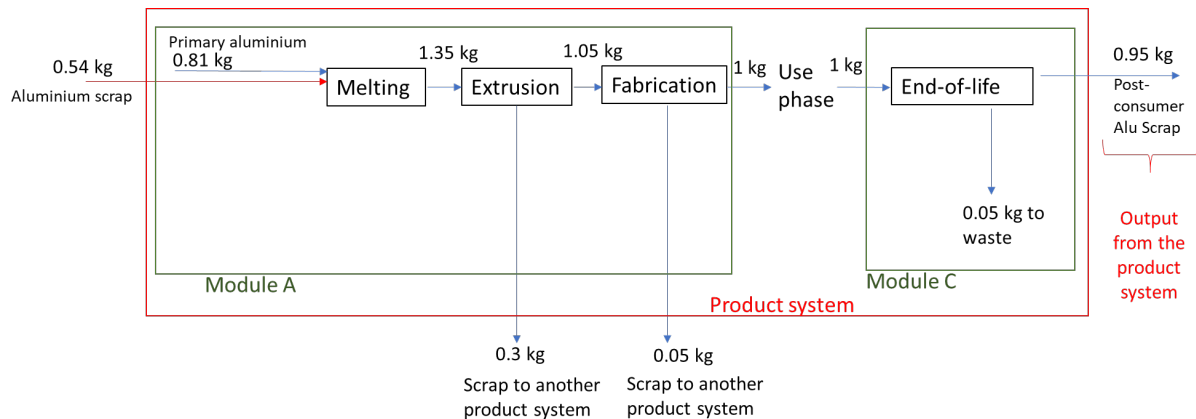


Figure 3. Example of open loop modelling for 1 kg of aluminium profile used in the final product. **Note to the Figure:** in the example reported in the figure the process losses within the value chain (for example due to oxidation in the melting) are not included to facilitate the understanding. However, such losses shall always be included in real calculations.

### 5.1.7 Modelling of recycled content and type of aluminium dataset used

If a product is produced using 100% primary aluminium, it can be only modelled with 100% primary aluminium sourcing.

Aluminium products are produced from ingot which may have different origins, e.g. directly issued from primary production or produced externally or internally from aluminium scrap and other input metals like ingot for remelting or master alloys. Hence, on a yearly basis, aluminium products have frequently a mixed sourcing of primary metal and recycled metal. If a product is manufactured with such mixed aluminium sourcing, i.e. with a percentage of recycled content, this should be reflected in the EPD and both primary and secondary aluminium shall be modelled as input to the production processes.

The percentage of recycled content in an aluminium product corresponds to the fraction of the aluminium mass in the product which originates from aluminium scrap, i.e. secondary materials (including pre- and post-consumer aluminium scrap). The recycled content does not correspond exactly to the aluminium scrap entering modules A1-A3 since the recycling process as well as the product manufacturing processes generates some metal losses. Additionally, the aluminium scrap input may contain some other elements (e.g. plastics, fabric, wood).

Aluminium semi-products delivered on the European market present an average recycled content of about 40% as reported in the document available at this link: <https://european-aluminium.eu/wp-content/uploads/2022/10/recycled-content-vs-end-of-life-recycling-rate-may-2016.pdf>. Hence, EPDs for products produced in Europe using a mix of primary and recycled aluminium coming from the market may use this value of 40% for the recycled content since it constitutes the average recycled content in Europe.

In practice, most manufacturers of aluminium building products operate several plants located in various European countries while their aluminium material supply usually comes from variable origins within or potentially outside Europe. For these reasons, in most cases, a European average approach for the aluminium supply is the most relevant for developing EPD on aluminium building products used in Europe and the average datasets developed by European Aluminium should be used.

However, if a company desires to use a recycled content higher than 40% for its own products, it shall demonstrate the accuracy of this number and provide appropriate evidences to the verifier concerning the recycled content of the product(s) under the EPD scope. If a specific recycled content is used for an aluminium product, this specific figure should be justified by a specific declaration and a commitment to maintain this specific figure during the next five years should be provided to the verifier by the EPD owner. When renewing such EPD, evidence has to be provided that the specific recycled content has been achieved over the period of validity of the EPD. In those EPDs, it is also recommended then to use company-specific aluminium datasets for the primary production and recycling.

In addition, when a specific value of the recycled content is used by a company, the following rules shall be followed for the calculation of the recycled content:

- The calculation should be based on a yearly production basis of one or several plants.
- The reference year shall not be older than 3 years
- The origin and traceability of the product shall be clearly demonstrated and proven.
- The recycled content shall be calculated for the aluminium parts actually used for the final product. Hence, the product system boundary shall include all manufacturing processes up to the final aluminium product.
- The calculation rules shall be consistent with the aluminium mass balance of the product system and the total metal input to the product system shall balance the total metal output from the product system. All scrap that is recycled in the same product system and do not cross the system boundary (i.e. modelled in closed loop) shall not be considered in the mass balance, i.e. not considered for the recycled content calculation, when the mass balance is done at the product system level (see Case 1 as example).

**Note:** the EPD shall contain the following statement *“This EPD cannot be used by the manufacturer as evidence of the actual recycled content of the product sold on the market. If such evidence is requested to the manufacturer, another declaration shall be provided by the manufacturer”*

#### 5.1.8 Modelling of modules B1-B7

- If module B is declared, a value for the reference service life (RSL) is mandatory.
- For products affecting the energy performances of buildings, e.g. external doors, windows and curtain walls, the thermal characteristics of the products shall be documented. In particular for windows and curtain walls, the following characteristics shall be provided
  - Dimensions and surface of transparent area;
  - Thermal transmittance of the product ( $U_w$ ) ( $W/m^2 \times K$ ) (in line with the values stated in the Declaration of Performance under Regulation (EU) No 305/2011);
  - Total solar energy transmittance (solar factor) of the product ( $g_w$ ) (%);
  - Air permeability class (L);
- Fire resistance/reaction to fire: A reference to the harmonised technical specification under Regulation (EU) No 305/2011, i.e. European harmonised Standard (hEN) or European Assessment Document (EAD) may be given.
- Module B1 - use of the installed product in terms of any emissions to the environment (not covered by B2-B7). If relevant, only non-energy related emissions in the use phase shall be included, i.e. emission or migration into the environment during normal intended use, as release of substances (interior or exterior) to indoor air, soil or water. As the energy efficiency related aspects shall be calculated at the building level, using the essential characteristics from the manufactured product, these shall not be included here.

- Module B2 – Maintenance. Maintenance and cleaning for aluminium building products should be modelled following the scenario described in Table 1 and Table 2.
- Module B3 – Repair. Repair of accidental damage (e.g. broken glass panes or damaged building hardware) shall only be considered if the place of installation is known and justification is provided for expecting accidental damage (e.g. school).
- Module B4 – Replacement. This module is not relevant at product level and doesn't need to be considered in cradle-to-grave EPDs.
- Module B5 – Refurbishment. This module is not relevant at product level and doesn't need to be considered in cradle-to-grave EPDs.
- Module B6 – Energy used to operate the product shall be reported under B6.
- The simulation of the energy balance during the use phase i.e. contribution of the element to the cooling and heating demands, can make sense for products contributing significantly to the building energy performances when the specific construction project is known. In this case, the contribution of the energy demand to the environmental aspects of the product may be part of the EPD calculation as part of additional information but not as part of the environmental parameters derived from LCA, i.e. not to be reported under module B7. In such case, the scenario and the corresponding parameters as well as the simulation tool and methodology, e.g. reference room, climatic zones and orientations, shall be fully documented and provided to the verifier. In the verification report; the verifier shall clearly state the relevance, robustness and transparency of the use phase simulation. The scenario and the corresponding parameters as well as the simulation tool description shall be also documented in the EPD.
- Module B7 – Operational water use. This module is usually not relevant for aluminium building products.

Scenario	Description
Low use (e.g. residential construction)	Biannual: Functional check, visual inspection, lubrication/greasing of building hardware, check for damage and, if necessary, carry out any maintenance.
Normal use (e.g. office or public buildings)	Annual: Functional check, visual inspection, lubrication/greasing of building hardware, check for damage and, if necessary, carry out any maintenance.
Heavy use (e.g. schools and hotels)	Half-yearly (depending on manufacturer's instructions): Functional check, visual inspection, lubrication/greasing of building hardware, check for damage and, if necessary, carry out any maintenance.

Table 1. Scenario for maintenance of aluminium building products (Table from EN17213:2020)

Scenario	Description
Rarely, manually	Less than 2,5 m in height or industrial climber, manually using suitable cleaning agents and if needed a pole – annually.
Rarely, using machines	More than 2,5 m in height, using bucket truck, crane, travelling cradle/maintenance platform, etc. – annually.
Frequently, manually	Less than 2,5 m in height or industrial climber, manually using suitable cleaning agents – every three months.

Frequently, using machines	More than 2,5 m in height, using bucket truck, crane, travelling cradle/maintenance platform, etc. – every three months.
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Table 2. Scenario for cleaning of aluminium building products (Table from EN17213:2020)

### 5.1.9 Clarification about the modelling of impact categories

- Due to the high uncertainty of toxicity indicators and the other so called “additional indicators” as defined in EN 15804:2019, especially for metals, it is recommended not to report in the EPD these additional indicators.
- The amount of primary energy used as raw material should be calculated by the mass multiplied by the lower heating value of the considered raw material. Different approaches shall be justified (e.g. lack of scientific data on lower heating value).
- The indicator “net use of fresh water” shall be presented by the indicator “consumptive freshwater use” according to ISO 14046. This means that the amount of evaporation (e.g. cooling towers), evapotranspiration (e.g. evaporation through irrigation), bound fresh water (e.g. concrete), and marine outfall of fresh water shall be added up.

### 5.1.10 Default end-of-life scenarios and end-of-life modelling

In case of multi-material products, the same collection rate should apply to all the materials included in the product<sup>4</sup>. Deviations shall be clearly reported and justified. The overall recycling rate, however, may be different for the different materials.

The end-of-life scenario to be used by default shall be the following, and any additional alternative scenario shall be justified and documented.

For windows, doors and curtain walling:

- collection rate: 99%;
- shredding efficiency: 95%;
- scrap recycled through refining process: 96.5%
- overall aluminium recycling rate:  $99\% \cdot 95\% \cdot 96.5\% = 91\%$ .
- For the glass used in windows, doors and curtain walling: always model two scenarios, one with 100% recycling of the glass and one with 100% landfill of the glass.

For aluminium sheets (coated, anodised, formed):

- collection rate: 99%;
- shredding efficiency: 99%;
- scrap recycled through refining process: 96.5%
- overall aluminium recycling rate:  $99\% \cdot 99\% \cdot 96.5\% = 95\%$ .

<sup>4</sup> Windows and doors are typical multi-material products included in the scope. At the end-of-life, the collection rate for all the materials used in the window (aluminium, steel, plastic, glass, etc) should be the same, e.g. the product at its end-of-life is collected. Exceptions may happen, for example, in the case of glass: glass is often crashed at the demolition side and not collected with the frames. In this case, glass should have a different collection rate. Deviations from the general rule shall be reported and justified.

690 For composite panels, PE core:

- 691 - collection rate: 99%;
- 692 - shredding efficiency: 95%;
- 693 - scrap recycled through refining process: 96.5%,
- 694 - overall aluminium recycling rate:  $99\% \times 95\% \times 96.5\% = 91\%$ .
- 695
- 696 - destiny of the PE core: 100% incineration.

697 For composite panels, FR and A2 core:

- 698 - collection rate: 99%;
- 699 - shredding efficiency: 95%;
- 700 - scrap recycled through refining process; 96.5%
- 701 - overall aluminium recycling rate:  $99\% \times 95\% \times 96.5\% = 91\%$ .
- 702 - destiny of the core: 100% landfill.

703 When modelling end-of-life, it is allowed to give several scenarios for module C and module D in  
704 addition to the default one defined above. Each scenario shall be calculated and reported separately  
705 in the project report and in the EPD.

706

707 The collection and processing of aluminium product at the end-of-life stage (Module C) generate the  
708 so-called post-consumer aluminium scrap. Provided that these aluminium scrap satisfy the end-of-  
709 waste criteria defined under the COUNCIL REGULATION (EU) No 333/2011 of 31 March 2011, they are  
710 then considered as secondary material exiting the system boundary which shall be considered for the  
711 net flow calculation addressed in Module D.

712 For the energy recovery from other waste stream (e.g. plastic parts), three different modelling cases  
713 can be distinguished:

- 714 ○ Thermal treatment of waste, means that the waste flow does not reach the end of  
715 waste status and the incineration plant has an efficiency rate lower than 0.6: the  
716 environmental loads of waste processing and incineration processes are declared as  
717 a disposal process in module C.4. Produced net energy due to treatment of waste is  
718 declared as exported energy in C4 and the benefits of the net energy generated is  
719 declared in module D.
- 720 ○ Energy Recovery from waste, the waste flow does not reach the end-of-waste status  
721 and the incineration plant has an efficiency rate higher than 0.6: the environmental  
722 impact of waste processing and incineration processes are declared as energy  
723 recovery in C.3, the produced net energy is declared as exported energy in C3 and the  
724 associated benefits of the generated net energy is declared in module D.
- 725 ○ Energetic use of a secondary fuel, means that the waste flow reaches the end-of-  
726 waste status prior to the combustion or thermal energy recovery process. This  
727 qualifies the material flow as a secondary fuel exiting the system boundary and the  
728 criteria for the efficiency rate is not applicable: the environmental impacts of waste  
729 treatment up to the secondary fuel are accounted in C3, the material flow is declared  
730 as a material for energy recovery from C3, and the combustion process including

731 transport as well as the benefits associated with the generated net energy are  
732 declared in module D.

733 Detailed information about the modelling of the end-of-life for aluminium building products are  
734 reported in Annex 01 of these General Programme Instructions.

## 735 5.2 Complementary Product Category Rules for specific building products in the 736 scope

737 This section describes the c-PCR to be respected when realising EPDs for specific aluminium building  
738 products.

739 All the EPDs shall be realised in compliance with:

- 740 • These General Programme Instructions
- 741 • EN 15804:2019
- 742 • c-PCR covering aluminium products developed as EN-standard to complement EN15804:2019  
743 (e.g. EN17213 for windows and doors)
- 744 • In case of divergence between the requirements of these General Programme Instructions  
745 and those of EN 15804:2019, the former prevails

### 746 5.2.1 c-PCR for windows and doors

747 A window is typically an opening in the wall of the building fitted with glass in a frame to admit light  
748 or air and allow people to see outside.

749 Doors are external or internal pedestrian doorsets. External pedestrian doorsets separate the  
750 internal climate from the external climate of a construction. Internal pedestrian doorsets are  
751 designed and used to close a permanent opening in internal separating elements (e.g. entry doors  
752 into flats). In both cases, the main intended use is the passage of pedestrians.

753 When realising an EPD for windows and doors, the requirements of the standard EN 17213<sup>5</sup> shall be  
754 fully respected.

755 The verification shall then be conducted to ensure that the EPD developed is aligned with the rules  
756 there included.

- 757 • Description of the standard-sized elements - The indicator results shall be calculated for  
758 standard sized elements. The configuration must be clearly stated in the EPD, and the  
759 standard sizes given below must be used for calculation:

760 Windows: 1,23 m x 1,48 m ( $\leq 2.3 \text{ m}^2$ )

761 1,48 m x 2,18 m ( $> 2.3 \text{ m}^2$ )

762 Doors: 1,23 m x 2,18 m ( $\leq 3.6 \text{ m}^2$ )

763 2,00 m x 2,18 m ( $> 3.6 \text{ m}^2$ )

764 Sliding/folding elements: 3,00 m x 2,18 m

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<sup>5</sup> EN17213:2020 Windows and doors. Environmental Product Declarations. Product category rules for windows and pedestrian doorsets.

If the manufacturer wants to give LCA indicator results for a non-standard size element, the manufacturer may either:

a) Report, as additional information, the indicator results for the following optional sizes:

Windows: 1,48 m x 2,18 m

Doors: 2,00 m x 2,18 m

Sliding/folding elements: 6,00 m x 2,18 m

Or b) report indicator results for a different size of element from those listed above in order to reflect the actual elements produced. In such a case, the exact dimensions used and a sketch of the element shall be provided in the EPD. This size-specific EPD shall not be used as a proxy for any other size of the element.

- Declared unit - 1 m<sup>2</sup> of window/door
- Technical characteristics - thermal insulation, air tightness; water tightness; wind load resistance, acoustic performance.
- Modelling of Module B2 – Maintenance. The boundary for maintenance for windows and doors includes (not exhaustive list): cleaning, lubricating, surface treatment, replacement or mending of worn or degraded parts. Replacement or repair of worn or degraded parts shall be considered for components with a known reference service life (RSL) shorter than the service life of the window/door (e.g. seals, building hardware and Insulating Glass Unit - IGU). Any replacement of the complete window/door after the RSL of separated components shall be considered under Module B4 when the calculations are performed at building level; Module B4 is not relevant at product level. The IGU shall always be calculated with a maximum of 30 years, unless otherwise indicated in the product standard EN 1279-5<sup>6</sup> or specified by the manufacturer for specific in-use conditions. The RSL provided from the original manufacturers of door closers, drivers, moveable blinds and shutters shall be used. If no RSL is known, an RSL of 20 years for drivers and door closers and of 25 years for blinds and shutters may be used.

### 5.2.2 c-PCR for curtain walls

A curtain wall is a part of the building envelope made of a framework usually consisting of horizontal and vertical profiles, connected together and anchored to the supporting structure of the building, and containing fixed and/or openable infills, which provides all the required functions of an internal or external wall or part thereof, but does not contribute to the load bearing or the stability of the structure of the building. Curtain walls are designed as self-supporting construction which transmits dead-loads, imposed loads, environmental load (wind, snow, etc) and seismic load to the main building structure (as defined in EN13830:2020<sup>7</sup>).

Curtain walling systems covered in this document are designed with extruded aluminium framing members potentially including thermal break made of non-conductive materials. The aluminium frame is typically infilled with glass panes. Other common infills include: stone veneer, metal panels, louvres, and operable windows or vents.

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<sup>6</sup> EN1279-5:2018: Glass in building. Insulating glass units. Product standard

<sup>7</sup> EN13830:2015+A1:2020: Curtain walling. Product standard

When realising an EPD for curtain walls the following complementary rules shall be respected and applied.

- Description of the reference product - The reference product should be a curtain wall of 6 m high by 3,6 m wide (called section in the following). A different area for the reference product may be used if justified. At least one sketch of the reference product shall be provided. In the description the following information shall be specified: type of glazing; number of vertical mullions in the selected area; number of horizontal transom in the selected area; dimensions of the sections; total number of sections; type of sections (if glazed or not). In case of non-glazed sections, the characteristics of the product used shall also be listed, including, material, density, finishing if applicable and other relevant information.
- Declared unit – 1 m<sup>2</sup> of curtain walling
- Technical characteristics – thermal transmittance (W/m<sup>2</sup>K); air tightness; water tightness; wind load resistance.
- Modelling – Without any reference to a specific building project, the bill of materials shall consider, as conservative estimate, 100% of the mass of the profiles located at the periphery of the reference product even if these frames may be shared with sub-subsequent curtain walling systems. For an EPD which refers to a specific building project, the bill of material and the related EPD results can be derived from the bill of materials of the full curtain walling system divided by its surface area expressed in m<sup>2</sup>. In such a case, the following statement shall be explicitly included in the EPD regarding its restricted scope and applicability “This bill of material and the associated EPD are only valid for the building project “Name of the building project + location” and shall not be used in other context”.  
In the case of curtain wall with integrated operable windows, the EPD shall explicitly include such window in the bill of material and the sketches.

### **5.2.3 c-PCR for aluminium sheets (mill finished, anodised, coated, formed)**

Aluminium sheets are finished solid sheets of different thicknesses (ideally comprised between 0.5 and 6 mm). The surface finishing can be realised through continuous (wet) coil coating or powder coating, anodizing or mill finishing. Aluminium sheets can also be formed, for example through corrugation, perforation, etc.

When realising an EPD for aluminium sheets the following additional rules shall be respected and applied.

- Description of the product - A description of the product shall be included in the EPD and in the project report. At least the following information shall be reported: characteristics of the aluminium sheet (area, sheet thickness, alloy type and temper, physical properties, forming if applicable); type of pre-treatment; top and reverse coat of the sheet (coating type, total thickness, thickness tolerance, number of coats, gloss) or finishing in case of anodizing of the sheet (thickness of the anodic layer); film protection (composition of film, thickness); total weight of the product; standard dimensions in which the product is available; tolerances in the dimensions.
- Declared unit – 1 m<sup>2</sup> of sheet or projected area in case of formed sheet, e.g. corrugated sheet.
- Technical characteristics – Tensile strength (N/mm<sup>2</sup>), yield strength (N/mm<sup>2</sup>), elongation (%)



#### 848 5.2.4 c-PCR for composite panels

849 Aluminium composite panels (ACPs), also named aluminium composite materials (ACMs) have a total  
850 thickness of 1 mm or more but do not exceed 6 mm. They consist of two external aluminium cover  
851 sheets, and an inner core material, also named filler.

852 The two external aluminium cover sheets each have a thickness of 0,05 mm or more but not exceeding  
853 0,5 mm.

854 The core material, is a polymer, mineral or a mix of both materials, in solid form and hardly  
855 compressible, of a thickness of 0,8 mm or more but not exceeding 5 mm.

856 The two external aluminium cover sheets can have different finishes: coated sheets are the most  
857 commonly used, but anodised sheets or simply 'mill finished' are other possibilities. When realising  
858 and EPD for composite panels the following additional rules shall be respected and applied.

- 859 • Description of the product - A description of the product shall be included in the EPD and in  
860 the project report. At least the following information shall be reported: characteristics of the  
861 aluminium sheets (area, sheet thickness, alloy type and temper, physical properties); type of  
862 pre-treatment; top and reverse coat of the outer sheet (coating type, total thickness, thickness  
863 tolerance, number of coats) or finishing in case of anodizing of the outer sheet (thickness of  
864 the anodised layer); coat and reverse coat of the inner sheet (coating type, total thickness,  
865 thickness tolerance, number of coats) or finishing in case of anodising of the inner sheet  
866 (thickness of the anodised layer); film protection (composition of film, thickness); information  
867 about the core (type of core, composition if not proprietary information, density, thickness);  
868 total weight of the product; total thickness of the product; standard dimensions in which the  
869 product is available; tolerances in the dimensions.
- 870 • Declared unit – The declared unit for this PCR is 1 m<sup>2</sup> of fabricated aluminium composite  
871 panels (typical delivery dimensions shall be specified). The weight per m<sup>2</sup> shall be specified in  
872 the EPD.
- 873 • Technical characteristics to be declared – section modulus (cm<sup>3</sup>/m), moment of inertia  
874 (cm<sup>4</sup>/m), rigidity (KNm<sup>2</sup>/m), ultimate tensile strength (N/mm<sup>2</sup>), yield strength (N/mm<sup>2</sup>),  
875 modulus of elasticity (N/mm<sup>2</sup>), sound reduction (dB), thermal resistance, (kg/m<sup>2</sup>), linear  
876 thermal expansion, elongation (%), colours and finish characteristics: gloss retention (%) and  
877 colour change (ΔE), and fire classification using data from reaction to fire tests according to  
878 standard EN 13501-1.

879

#### 880 6. Process for development, review and maintenance of PCR

881 The Technical Committee decides when a new PCR document should be developed under the EPD  
882 Programme. The Technical Committee prepares then a new draft PCR document.

883 The Technical Committee also prepares the draft PCR documents for any revision or update. All the  
884 PCRs are valid for five years. The Chair of the Technical Committee provides the draft PCR document  
885 to the PCR Review Panel.

886 The review statement, comments of the members of the review panel and any response from the  
887 Technical Committee to recommendations made by the reviewers, shall be included in the PCR  
888 document.

889 In particular, the PCR review shall ensure that:

- 890 • The PCR supports credible and consistent EPDs
- 891 • The PCR is in conformity with the standards listed in Section 2 and with c-PCR developed under
- 892 CEN for the specific product category, if existing
- 893 • The PCR provides appropriate and helpful complementary guidance to EN15804:2019 for the
- 894 aluminium product under its scope.
- 895 • The additional information is based on scientifically sound methodologies

896 The PCR Review Panel reviews the PCR document and requires accordingly a consolidation of the  
897 document. The final version of the PCR shall be agreed by each member of the review panel. In the  
898 final version, comments from the members of the PCR Review Panel can be added as annex.

899 The final versions of the PCRs are published and freely accessible on the website at [www.european-](http://www.european-aluminium.eu)  
900 [aluminium.eu](http://www.european-aluminium.eu).

## 901 **6.1 Definition of product categories**

902 The Technical Committee defines which product category is covered by a PCR document and decides  
903 if a new PCR shall be developed to cover a new product category.

## 904 **7. Process for EPD development and registration**

905 EPD to be registered in the European Aluminium EPD Programme may be generated with or without  
906 an approved LCA-tool for EPD. In case the submitted EPD is generated by an LCA-tool for EPD, the  
907 approval of the tool shall happen first.

908 To register an EPD to the European Aluminium EPD Programme, the manufacturer shall submit a  
909 request to the Programme Operator and cover the associated fees respectively for the verification  
910 and, in case of positive verification, for the registration (see Section 4.7 for details about the fee).

911 Following the request and the payment of the verification fee, the Programme Operator will select a  
912 verifier who will be in charge of the verification of the EPD and of the associated documents. The  
913 verification will happen as described in Section 8.

914 Following the positive outcome of the verification process, the verified EPD will be submitted to the  
915 final approval of the EPD program operator which will secure that the EPD satisfies all the conditions,  
916 especially in relation to section 3.1 defining the task of the program operator. If it is the case, the  
917 verified EPD will then receive the electronic signature of the Programme Operator.

918 Under condition of payment of the registration fee, the approved verified EPD will be registered and  
919 issued in the EPD Programme of European Aluminium and uploaded on the website.

920 The EPD is valid for 5 years from the date of issue.

### 921 **7.1 Template for EPD**

922 All the EPDs shall use the template provided in Annex 03 of the General Programme Instructions.  
923 Adding or removing sections from the template is not allowed. It is however allowed to replicate  
924 sections in case the EPD includes more than one product.

925 The use of EPD within BIM tools is the object of the standard ISO/CD 22057 on “enabling use of  
926 Environmental Product Declarations (EPD) at construction works level using building information  
927 modelling (BIM)” currently under development.

Each EPD shall include the following statement:

“The use of this EPD within BIM tools is in principle limited to the products explicitly included in the EPD. The scaling of results to model similar products can only be done if justified and transparently reported in the project report. Any responsibility regarding the misuse of this EPD by third parties is not accepted by the Programme Operator”

## **7.2 Optional additional information in EPDs**

The sections 7.2.1 till 7.2.3 describe optional additional information that may be included in the EPD. If declared, this additional information shall be verified. The below lists are not exhaustive and other additional information may be added if relevant.

### **7.2.1 Additional environmental information**

The following additional environmental information may be declared in the project report, in the EPD and, if declared, the availability of documentation supporting such statements shall be specifically verified by the verifier during the verification process. The decision to include these statements in the EPD and in the project report is with the EPD owner.

- Presence in the product of substances included in the Norwegian priority list (Yes or no, if yes the CAS number and the quantity shall be specified)
- Presence in the products of substances regulated in Annex XIV of REACH (Yes or no, if yes the CAS number and the quantity shall be specified)
- Presence in the product of substances included on the ECHA candidate list – SVHC list (Yes or no, if yes the CAS number and the quantity shall be specified)
- Presence in the product of substances included on the Classification and Labelling inventory database under ECHA (Yes or no, if yes the CAS number and the quantity shall be specified)
- Presence in the product of substances included on the registry of classification and labelling (CLH) intentions until outcome (Yes or no, if yes the CAS number and the quantity shall be specified)Special measures for environmental protection at the building site during installation, if applicable.
- Additional requirements for calculating environmental impacts on air pollution and water pollution (water pollution m<sup>3</sup>/FU; air pollution m<sup>3</sup>/FU)
- Information on comfort (hygrothermic comfort; acoustic comfort, visual comfort, olfactory comfort)
- Sanitary characteristics (VOCs and formaldehyde; Information on indoor air emissions regulations regarding hazardous substances by building products; behaviour against microorganisms; smells; radioactive emissions)
- Indoor air quality and water quality

### **7.2.2 Occupational health and safety during production and installation**

- Description of occupational health and safety aspects if relevant.
- Special measures for health and occupational protection at the building site during installation, if applicable.

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### 7.2.3 External influences

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- A short description of alteration of the product during use, caused by external effects as from climate or other wearing influences, e.g.:

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973

- Cleaning;

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- Thermal shock;

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- Mechanical alteration e.g. from wind.

976

- A short description of possible environmental impacts caused by special influences, e.g.

977

- Fire.

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### 7.3 Multiple products in the same EPD

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It is allowed to have the following types of EPD:

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- a) For one or more specific products produced by one company

981

- b) For one or more average products produced by one company

982

- c) For one or more average products produced by multiple companies

983

- d) Consolidated EPDs (see section 7.3.1)

984

It is allowed to group similar products produced by the same company in the same EPD under condition that these products have the same function and share the same core processes. The results for each similar product shall be reported separately in specific sections as part of the same EPD document.

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For complex products with many variants available, e.g. windows, it is allowed to calculate the EPD results just for one reference variant of the product. Such EPD results may be considered as representative of all the variants provided that:

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- the mass of the declared unit of the variants is comprised between 80% and 100% of the mass of the declared unit of the reference product, with 100% being the mass of the declared unit of the reference product for which the EPD is calculated.

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- The mass of the aluminium in the declared unit of the variants is always lower or equal compared to the mass of aluminium of the declared unit of the reference product.

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996

Some examples:

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The aluminium coated sheet "XXXX" is produced in three thicknesses (0.5 mm, 1 mm, 2 mm). It is possible to include in the same EPD the three thickness of aluminium coated sheet, however three different tables shall be included to describe the environmental impacts for each thickness.

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1000

The composite panel "XXX" is produced with three different core materials (PE, FR, A2). It is possible to include in the same EPD the three type of composite panels, however three different tables shall be included to describe the environmental impacts for the three panel variants.

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1003

The window "XXX" is produced with three different types of opening, in the version with mono-rail and 2-rail, with double or triple glazing. It is possible to include in the same EPD all the variants of the window, however the heaviest option between the three different types of opening and the version of mono rail and 2-rail could be selected as representative of the product. Then two different tables shall be included to describe the results for such reference product in the case of double and triple glazing.

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### **7.3.1 Consolidated EPDs**

1011 In some building projects, several aluminium building products can be designed according the  
1012 requirements defined at building level. This is often the case for windows, doors or curtain walls. These  
1013 customised products are non-standardised products. Producing one EPD for each of those products is  
1014 then time-consuming and unpractical. For those products, the European Aluminium EPD Programme  
1015 allows producing one EPD for a set of products instead of producing a separate EPD for each of these  
1016 products. This consolidated EPD aims at facilitating “Business-to-Business” communication and the  
1017 further use of the EPD for assessing the environmental performance of the building itself.

1018 A consolidated EPD shall be used only for aluminium products which are designed specifically for a  
1019 building project. For those products, a consolidated EPD can be produced provided that the following  
1020 additional requirements are satisfied:

- 1021 • The-declared unit is univocally defined as the sum of the different products included in the  
1022 EPD. Each variant of the products included in the consolidated EPD is described. This  
1023 description shall include at least the typical dimensions including a drawing of the cross  
1024 section, the total mass and the reference service life.
- 1025 • If scenarios and additional technical information, are documented, this information shall be  
1026 provided for each variant of the products included in the consolidated EPD.
- 1027 • If required, additional information on release of dangerous substances to indoor air, soil and  
1028 water during use stage shall also be provided for each variant of the products included into  
1029 the consolidated EPD.
- 1030 • An overall bill of material, i.e. list of components and materials constituting the consolidated  
1031 EPD, contributing for at least 95% of the total mass of the consolidated EPD is documented
- 1032 • The calculations of consolidated products based on the bill of materials shall include their  
1033 respective manufacturing processes and be described in Life Cycle Modules A1- A3.

1034 An example on how to calculate consolidated EPDs is reported in Annex 02.

1035

### **7.4 Validity, recalculation, expiration and nullification of EPDs**

1036 The EPDs registered in the European Aluminium EPD Programme are valid for 5 (five) years provided  
1037 no relevant technological changes (e.g. change in the electricity mix) happen at product or  
1038 organization level or other circumstances that will alter the results of the environmental impact  
1039 declared in the EPD and its accuracy.

1040 An EPD shall be evaluated and updated before the expiration of its validity period as soon as it  
1041 becomes necessary to consider relevant technological changes or other circumstances which would  
1042 change its content and accuracy.

1043 In case a relevant technological change at product or organization level or other circumstances  
1044 happen, the company owning the EPD shall promptly inform the Programme Operator, who will  
1045 involve a verifier to check if the EPD can still be consider valid or if it has to be recalculated (see section  
1046 7.5).

1047 The EPD should be recalculated if the change will imply an increase of more than 10% for at least one  
1048 impact category among the mandatory indicators as defined by EN15804:2019.

A manufacturer may decide to update the project report, the life cycle assessment and to recalculate the EPD and have it re-verified at any time during the validity of the EPD, even if no relevant changes occur

If the EPD owner desires prolonging the EPD validity after the expiration date, the project report, the life cycle assessment and the EPD shall be revised and updated according to the current PCR and a new verification process shall take place. In practice, new EPD results should be calculated based on the updated LCA models and updated background datasets.

However, the validity of an EPD can be extended after expiration without LCA recalculation provided:

- the reference standards, the General Programme Instructions and the reference PCRs have not changed significantly.
- The EPD owner can demonstrate that
  - o most relevant background datasets, excluding AI-datasets, are no more than 10 years old
  - o no major changes in the processes and corresponding LCA models have taken place since the original verification
  - o the aluminium datasets used in the EPD are still the latest available and no updated aluminium datasets have been published in the meantime by European Aluminium. If new aluminium datasets have been published and those new datasets will reduce the total environmental impact of the product included in the EPD, the company owning the EPD may decide to not recalculate the EPD, since the results included in the current EPD are higher than those that will be recalculated.

If all the three points above are respected, the Programme Operator may allow the extension of the validity of the EPD for a period comprised between 6 months and maximum 2 years. The length of the extension period will be mainly decided based on the age of the most relevant background datasets used.

If the extension of validity for the EPD is not granted, the EPD and LCA study shall be modified and verified again.

The Programme Operator may decide to revoke EPDs if the manufacturer has altered or forged EPDs.

## **7.5 Communication, ownership, responsibility and liability for the EPD**

All EPDs in course of validity are available on the website of European Aluminium ([www.european-aluminium.eu](http://www.european-aluminium.eu)). Expired EPDs are listed on the website, but they are available only upon request.

The authorization for the use of an EPD belongs to the owner of the EPD (ownership declaration). Changes in the layout and contents of the EPD are in principle inadmissible. Exceptions are possible only with agreement of the Programme Operator.

A manufacturer or a group of manufacturers are the owners and holders of the respective EPD, for whose data and contents they are liable and responsible. Beyond that, they are liable for all available data, and certify the completeness and correctness thereof in writing. In the case of data misuse or manipulated information, the Programme Operator reserves its right to revoke the EPD (s) in question, as well as to take further legal action.

## **8. Process for verification**

### **8.1 Independence of verification**

The verification shall be carried out by an independent external third party who was neither involved in the life cycle assessment nor in the development of the declaration and was not exposed to conflicts of interest based on his professional activities.

### **8.2 Requirements for verifiers**

The verifiers shall fulfil the minimum requirements listed in this section. The compliance with these requirements shall be checked by the Programme Operator as described in Section 8.3.

The verifier shall fulfil the following minimum requirements:

- Preferably university degree in engineering or natural science or equivalent disciplines
- Appropriate professional experience in the construction sector or a related field
- Knowledge of the product category and product-related environmental aspects
- Knowledge of the product category and the production processes
- Expertise in LCA and methodology for LCA work
- Practice in using simulation tools for generating LCA (e.g. GaBi, Umberto, Simapro)
- Knowledge of relevant standards in the fields of environmental labelling and declarations and LCA
- Knowledge of the framework within which requirements for Type III environmental declarations have been prepared.
- Knowledge of the General Programme Instructions of European Aluminium EPD Programme.
- Previous experiences in the verification of EPDs for registration in Type III Programme Schemes (e.g. at least 5 EPDs verified)
- Professional knowledge of the English language

If the owner of the EPD wish to have its EPD transferred to the German database Ökobaumat the following additional requirement shall also be fulfilled:

- Knowledge of the Ökobaumat requirements for modelling and calculation of the indicators.

### **8.3 Checking competence and independence of verifiers**

The compliance with the requirements concerning independence and competence of the verifiers described in Section 8.1 and 8.2 shall be checked by the Programme Operator.

For this check to take place, the verifier shall submit to the Programme Operator before starting the verification process the following documents:

- An updated curriculum vitae
- A self-declaration of compliance to the points that are not covered by the curriculum vitae
- A self declaration of independence (ISO/TS 14071:2014<sup>8</sup> - Annex B can be used)
- Any other additional document, publication or certificate that may help verifying the compliance with the minimum requirements.

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<sup>8</sup> ISO/TS 14071:2014 - Environmental management — Life cycle assessment — Critical review processes and reviewer competencies: Additional requirements and guidelines to ISO 14044:2006.

The Programme Operator shall keep these documents at least for the duration of validity of the EPD being certified. The information and documents collected by the Programme Operator will be treated with the outmost care and respect. These documents may be shared with third parties, providing an explicit agreement of the verifier, only in the following situations:

- An accusation has been moved by an external entity to the Programme Operator. The Programme Operator may show the proof of compliance for the independence and competence of the verifier
- In the case of recognition of the EPD in other schemes, if this information is asked by the other Programme Operators before accepting the EPD.

#### **8.4 List of approved verifiers**

For being approved, the verifier shall submit to the Programme Operator the documents listed in Section 8.3 to demonstrate his/her independence and competence according to the requirements listed in Section 8.1 and Section 8.2. Once approved by program operator, the verifier is included in the list of approved verifier for a duration of maximum 5 years.

After 5 years, a re-appointing of the verifier by the Programme Operator shall take place. In this case, the verifier shall confirm to the Programme Operator that the requirements described in 8.1-8.2 still apply.

The program operator shall maintain a list of at least 3 approved verifiers.

#### **8.5 Appointment of the verifier**

The program operator is in charge of:

- contacting potential verifiers
- introducing the verification work of the EPD
- pre-selecting the verifier(s) ready to perform the verification work

The verifier for an EPD shall be chosen in the list of approved verifiers. The verifier is proposed by the program operator. After agreement from the EPD owner, the verifier will be contacted by the program operator for organising the verification process.

Only after the signature of a verification agreement, including timeframe and cost, the verifier can be formally appointed and may start the verification.

The members of the Review Panel, including the Chair, may also be proposed and appointed as verifiers if they satisfy sections 8.1 and 8.2.

#### **8.6 General principles for the verification of EPDs**

The independent verification procedure shall as a minimum be appropriate to determine whether the Type III environmental declaration is in conformance with

- ISO 14020:2000 and the relevant requirements of ISO 14025:2010
- these Programme Rules and
- current and relevant PCR.

The verification procedure shall be transparent. The independent verifier shall generate a report documenting the verification process, while adhering to the obligations concerning rules for data



confidentiality. This report shall be available to any person upon request. The verification procedure shall confirm whether the information given in the Type III environmental declaration accurately reflects the information in the documents on which the declaration is based. The verification procedure shall also confirm whether this information is valid and scientifically sound.

## **8.7 Verification of EPDs generated without an approved LCA-tool for EPDs**

The EPD verification shall cover the following main areas:

- Plausibility of data collected and used for the calculations
- The way the LCA-based calculations have been carried out and their methodological conformity with EN 15804:2019.
- The presentation of the environmental performance in the EPD
- The presentation of the additional environmental performance in the EPD

The verification may be performed “on-site”.

To perform the verification, the verifier shall be granted full access to:

- The project report of the EPD
- The EPD
- The modelling on the software

The verification of an EPD is an iterative process and includes a review for completeness, plausibility, consistency, and the transparency of the calculations and data in the project report and the EPD.

A review of the accuracy of the data provided by the manufacturer that goes beyond the plausibility test and the reliability of the life cycle assessment software used are explicitly not the object of the verification. The verifier shall however check the correct use of the evaluation methods in the life cycle assessment software used, the correct use of manufacturer data in the life cycle assessment software, the attribution of manufacturer’s data to datasets within the LCA software (i.e. which datasets have been selected for each input/output reported by the manufacturer) as well as the correct use of values/units in the LCA software (e.g. via screenshots).

The verification procedure shall confirm whether the information given in the EPD accurately reflects the information in the documents on which the declaration is based.

The verification procedure shall also confirm whether this information is valid and scientifically sound.

The verification shall at minimum confirm:

- Conformance with the European Aluminium EPD Programme
- Conformance with the PCR, if available, and EN 15804:2019
- Conformance to c-PCR developed for specific products under CEN, if available
- Plausibility, quality, accuracy and completeness of the LCA-based data
- Quality and accuracy of additional environmental information
- Quality and accuracy of the supporting information

The verifier shall perform the verification of the EPD using the template provided in Annex 05 of this document. At the end of the verification, the verifier shall provide a verification statement and the verification report to the EPD owner and to the Programme Operator. The verification statement shall be based on the verification statement template provided in Annex 08.

1206 The verification report is available to any person upon request and, for this reason, it shall not include  
1207 any confidential or sensitive information.

## 1208 **8.8 Verification of EPDs generated with an approved LCA-tool for EPDs**

1209 EPDs generated with an approved LCA-tool for EPDs may undergo a simplified verification since the  
1210 modelling choices, assumptions and datasets have already been verified during the process of  
1211 approval of the LCA-tool for EPDs. For the rules and requirements to approve the LCA-tool for EPDs  
1212 please refer to Section 8.8.

1213 In the case of EPD generated by an approved LCA-tool for EPDs, the EPD verification shall cover the  
1214 following main areas:

- 1215 - Data collected and used for the calculations – limited to the bill of materials and the  
1216 parameters used as input to the LCA-tool for EPDs
- 1217 - The presentation of the environmental performance in the EPD
- 1218 - The presentation of the additional environmental performance in the EPD

1219 In order to perform the simplified verification of EPDs generated by LCA-tool for EPDs the verifier shall  
1220 be granted full access by the owner of the LCA-tool for EPDs to:

- 1221 - The project report of the LCA-tool for EPDs
- 1222 - The user guidance of the LCA-tool for EPDs
- 1223 - The LCA-tool for EPDs approval report
- 1224 - A “calculation test”<sup>9</sup> for each product covered by the EPDs with the list and values of the free  
1225 parameters or the inventory used to calculate it.

1226 In addition, the verifier shall be granted full access to:

- 1227 - The bill of materials and the list of parameters used to generate the EPDs on the tool with  
1228 appropriate justification for the choice made
- 1229 - The simplified project report of the EPD
- 1230 - The EPD

1231 **Note:** the simplified project report should not repeat the information already included in the project  
1232 report of the LCA-tool for EPDs. It shall however provide the results and the analysis and interpretation  
1233 of the results for the specific EPD, together with an explanation of the main parameters used in the  
1234 calculation of the EPD.

1235 The verifier may decide to perform random checks on the LCA-tool for EPDs to verify the replicability  
1236 of the results, the integrity and the correspondence between the content of the project report and  
1237 the LCA-tool for EPDs. If this is done, the owner of the LCA-tool for EPDs shall grant the verifier the  
1238 access to the LCA-tool for EPDs, via web-conference or physically.

1239 The verification may be performed “on-site”.

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<sup>9</sup> The “calculation test” is a document in word, pdf or excel format that shall include the results of the calculation for each indicator listed in EN15804:2019 including:

- Core environmental impact indicators
- Additional environmental impact indicators
- Indicators describing resource use and environmental information based on life cycle inventory (indicators describing resource use; environmental information describing waste categories; environmental information describing output flows)

1240 The verifier of the EPD generated by an approved LCA-tool for EPDs shall perform the verification of  
1241 the EPD using the template provided in Annex 04 of this document. At the end of the verification, the  
1242 verifier shall provide a verification statement and the verification report to the EPD owner and to the  
1243 Programme Operator. The verification statement shall be based on the template for the verification  
1244 statement provided in Annex 08.

1245 The verification report is available to any person upon request and, for this reason, it shall not include  
1246 any confidential or sensitive information.

## 1247 **8.9 Approval of LCA-tools for EPDs**

1248 It is possible to use customised software to support the generation of EPDs, such software are  
1249 software systems to automatically or semi-automatically generate LCA results to be included in EPDs  
1250 (named LCA-tool for EPDs in the following).

1251 The Programme Operator maintains a list of approved LCA-tools for EPDs that have been approved  
1252 according to the rules listed in this section.

1253 The approval of the LCA-tool for EPDs will allow to proceed to a simplified verification of the EPDs  
1254 generated with this software. The approval of the LCA-tool for EPDs does not substitute the  
1255 verification of the EPDs.

1256 The EPDs generated with approved LCA-tool for EPDs shall follow the rules for simplified verification  
1257 described in Section 8.7.

1258 The owner of the LCA-tool for EPDs and the owner and/or the author of the EPD may differ.

1259 In order to be eligible for approval, the LCA-tool for EPDs shall have the following characteristics:

- 1260 • The LCA-tool for EPDs is aligned with the requirements of the General Programme Instructions  
1261 of the European Aluminium EPD Programme, EN 15804:2019 and of the PCR(s), if existing.
- 1262 • The calculations, the models and the evaluation methods included in the LCA-tool for EPDs  
1263 cannot be altered by the user.
- 1264 • The models, the calculations and the assumptions implemented in the LCA-tool for EPDs are  
1265 described in a project report
- 1266 • A guidance for the user of the LCA-tool for EPDs should be available. It should also include the  
1267 list of parameters that the user can modify.
- 1268 • The background databases and methods used in the LCA-tool for EPDs are periodically  
1269 updated by the owner of the LCA-tool for EPDs.
- 1270 • The owner of the LCA-tool for EPDs maintains a list of individual users that are authorised to  
1271 use the software to generate EPDs.
- 1272 • A reference number of the software (e.g. version 1.0) which correspond to a specific version  
1273 of the background datasets. An update of the background database should lead to a new  
1274 version of the tool as the results will not be comparable, at least in the second digit, e.g.  
1275 version 1.1.

1276 For an LCA-tool for EPDs to be approved, the owner of the LCA-tool for EPDs shall submit a formal  
1277 request to the Programme Operator providing the following information:

- 1278 - Products covered by the LCA-tool for EPDs
- 1279 - Expected number of EPDs generated per year
- 1280 - Declaration that the LCA-tool for EPDs fulfils the minimum requirements listed above

1281 - Declaration of full collaboration with the verifier that will be invited to approve the LCA-tool  
1282 for EPDs

1283 Once the Programme Operator approves the request, it will ask the owner of the LCA-tool for EPDs the  
1284 payment of a fee (see Section 4.6 for details) that will cover the cost for an independent verifier that  
1285 will perform the approval of the LCA-tool for EPDs. Once the fee is paid, the process of approval can  
1286 start.

1287 The independent verifier for the approval of an LCA-tool for EPDs is proposed by the Programme  
1288 Operator and appointed in agreement with the LCA-tool for EPDs owner.

1289 The verifier shall check, using the checklist provided in Annex 06, that:

- 1290 - The LCA-tool for EPDs is line with the requirements of the General Programme Instructions of  
1291 European Aluminium, EN 15804:2019 and the PCR(s), if available.
- 1292 - The choice of data and datasets
- 1293 - Data quality, sources and references
- 1294 - LCA modelling hypotheses, including system boundary, cut offs, allocation rules, calculation  
1295 rules.
- 1296 - The functionality for the calculation of the EPD results
- 1297 - Procedures established for updating the information in the tool
- 1298 - Software usability and security
- 1299 - Replicability of the results

1300 At the end of the process, the verifier will send an approval report to the Programme Operator and to  
1301 the owner of the LCA-tool for EPDs. In the approval report, the verifier shall specify which information  
1302 have been checked and which information shall be verified each time in case EPDs are generated with  
1303 the approved LCA-tool for EPDs. As Annex to the approval report the verifier shall send a “calculation  
1304 test”<sup>10</sup> for each product covered by the approved software with the list and values of free parameters  
1305 used to calculate it. This document may be used by the verifier of the EPD generated with the software  
1306 in case he/she wishes to check the replicability of the results and if any modification has been  
1307 implemented in the tool after its approval.

1308 The regular update of the background databases and methods is considered to generate a new version  
1309 of the software that shall be reflected in the name of the software in the second digit (from example  
1310 from 1.0 to 1.1). This type of update shall be recorded by the owner of the LCA-tool for EPDs and the  
1311 update must be communicated promptly to the Programme Operator, however such type of update  
1312 does not require a new approval by the verifier since no change in the modelling have been  
1313 implemented. With each update, the owner of the LCA-tool for EPDs shall send to the Programme  
1314 Operator a “calculation test” for each product covered by the LCA-tool for EPDs with the list and values  
1315 of free parameters or the inventory used to calculate it (see section 8.7 for the definition of calculation  
1316 test).

1317 Any other change that differs from the regular update of the background databases and methods will  
1318 imply that a new version of the LCA-tool for EPDs is generated and the approval procedure shall be  
1319 repeated.

1320 If no changes are implemented in the LCA-tool for EPDs , it should be approved again within five years  
1321 from the previous approval.

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<sup>10</sup> See footnote number 6.

## **9. Other aspects**

### **9.1 Avoidance of misuse of the programme and related EPDs**

The generally applicable laws for the protection of intellectual property applies. If the Programme Operator learns about the misuse of the name of the EPD Programme Scheme or the publication and use of falsified EPD under the European Aluminium programme, the Programme Operator will explicitly communicate the invalidity of those EPD and the owner of the falsified EPD may be prosecuted under the Belgian laws.

In the event of offences against the rules of the European Aluminium programme and/or incorrect EPDs, the Programme Operator may correct or revoke an EPD at any time. the Programme Operator reserves the right to publish the EPDs that were declared invalid and revoked. This it does not require the consent of the EPD owner.

### **9.2 Appeals & complaints**

An appeal is the client's request to review the verification decision. A complaint is the client's expression of dissatisfaction regarding the organisation and services of the EPD program. Only a written appeal or complaint to the Director General of European Aluminium (Programme Operator) will be considered.

In both cases, European Aluminium will provide a justification in writing. If the justification provided is not acceptable to the client, and should an agreement not be reached with European Aluminium, other legal options are available to the client.

Following a complaint from a third party on the results included in a specific EPD, a revision process of such EPD may be initiated by the Programme Operator. The Programme Operator will deal with such special case on ad hoc basis, ensuring that the principles and criteria described in the Programme Rules are applied.

### **9.3 European Aluminium Liability as Programme Operator**

As Programme Operator, European Aluminium is only liable in the event of a breach of a contractual obligation.

European Aluminium is not liable for the misuse of EPDs by third parties.

European Aluminium is not liable for damages based on inaccuracies or mistakes in the data produced by the companies owning the EPD for the calculation of the results included in their EPD, even if this results in incorrect results for the specific product.

## **10. Previous versions of the General Programme Instructions**

The General Programme Instructions of the EPD Program of European Aluminium has been published in:

- Version 1 -14/11/2005
- Version 2 – 30/01/2013
- Version 3 – 23/09/2020 (current version)

Only the current version of the General Programme Instructions is available on line at [www.european-aluminium.eu](http://www.european-aluminium.eu). The previous versions of the General Programme Instructions are available upon request sending an email to: [epd@european-aluminium.eu](mailto:epd@european-aluminium.eu).

## 11. References

- EN 15804:2019 – Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- EN17213:2020 Windows and doors. Environmental Product Declarations. Product category rules for windows and pedestrian doorsets.
- EN1279-5:2018: Glass in building. Insulating glass units. Product standard
- EN13830:2015+A1:2020: Curtain walling. Product standard
- Environmental Profile Report, 2018. Published by European Aluminium. Available at [https://european-aluminium.eu/resource-hub/environmental-profile-report-2018/#:~:text=Environmental%20Profile%20Report%202018,footprint%20across%20the%20value%20chain.&text=For%20the%20semi%2Dfabrication%20\(rolling,of%20those%20processes%20in%20Europe.](https://european-aluminium.eu/resource-hub/environmental-profile-report-2018/#:~:text=Environmental%20Profile%20Report%202018,footprint%20across%20the%20value%20chain.&text=For%20the%20semi%2Dfabrication%20(rolling,of%20those%20processes%20in%20Europe.)
- ISO 14020:2000 - Environmental labels and declarations — General principles
- ISO 14025:2010 – Environmental labels – Declarations – Type III Environmental Declarations – Principles and procedures.
- ISO/TS 14027:2017 – Environmental labels and declarations — Development of product category rules
- ISO 14040:2006 – Environmental management – Life cycle assessment – Principles and framework
- ISO 14044:2006/AMD 1:2017 – Environmental management — Life cycle assessment — Requirements and guidelines — Amendment 1
- ISO 21930:2017 – Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services.
- ISO/TS 14071:2014 - Environmental management — Life cycle assessment — Critical review processes and reviewer competencies: Additional requirements and guidelines to ISO 14044:2006.

## ANNEX 01 – Clarifications and examples about modelling of Mod. A-D for aluminium products

### Introduction

Aluminium is used in the building and construction sector for structures, cladding, roofing, window frames, heating equipment and many other applications. Due to their high strength, stiffness and excellent corrosion-resistance, aluminium components can bear loads with design freedom on very long service life. Most often, aluminium building products will satisfy the service life of the building itself.

In addition to their technical properties, aluminium products have also a unique characteristic which is their ability to be efficiently and economically reused or recycled without altering their properties. Already, today, more than 95% of the metal products used in buildings are collected at end-of-life. As an example, a study [1] performed on several demolition sites in Europe has demonstrated that more than 96% of the aluminium-content of these buildings was selectively collected and sent to recycling facilities.

High economic value is the main driver for the systematic dismantling, collection and recycling of metal products. As aluminium recycling provides energy savings up to 95% compared to primary production [2], aluminium recycling creates a win-win situation for both the environment and the economy.

Today, two contrasting approaches are generally used to tackle recycling aspects: the recycled content approach [100:0] or the end of life recycling approach [0:100].

On one hand, the recycled content approach [100:0] uses a cut-off approach, which only considers the recycled material in the mass fraction of the product issued from recycling. This approach neglects the recycling performances of the product at the end of its life stage. Even though the end of life recycling rate of metal building products is usually high, e.g. around 90%-95%, the average recycled content in aluminium products does not reach such a level on a global scale. In reality, the recycled content is currently limited by the scrap availability which is the bottle neck of the aluminium supply from recycled sources. The growth in the use of aluminium over many years, and the fact that aluminium building products have a service life of decades, creates a shortage of available aluminium scrap that has to be supplemented using primary aluminium to satisfy demand. Thus, the recycled content metric alone is usually not adequate to reflect and integrate the recycling performances of aluminium products in an EPD.

On the other hand, the End-of-Life (EoL) recycling approach [0:100] considers the recycling rate of the studied product as the relevant parameter for tackling the environmental aspects of recycling. For metal products, **the recycling rate** corresponds to the actual amount of metals obtained from recycling with the amount of metal initially available within the product. The metal industry considers that this end of life recycling approach is the most relevant for metal products in order to maximise and preserve metal availability for future generations as explained in the common Metals Declaration on Recycling [3], published in 2006. This end of life recycling approach is also accepted in the scientific community as UNEP [4]. Under the Product Environmental Footprint guidance [5], the circular footprint formula considers a contribution of the end of life recycling parameter for metals which is four times more relevant than the recycled content. This ratio demonstrates the higher relevance of the recycling rate metric for metals.

In EN15804:2019, the cut-off approach was chosen for the Module A (production), Module B (use) and Module C (End of life stage) meaning that the recycling benefits of building products at end of life cannot be reported in those modules. An additional module, the so-called 'module D', was therefore needed for transparently reporting the additional benefits which result from the recycling or energy recovery at the end of life of the building product. For closed material loop recycling, as in the case of metals, Module D avoids any double crediting or counting since only the net benefits of recycling are reported based on the net flow, i.e. the secondary material exiting the system boundary at the end of life minus the secondary material already considered at the production stage. Module D is not restricted to metal scrap, as it allows reporting the environmental aspects from the net flow resulting from any secondary material or secondary fuel entering and exiting the product system boundary.

Fig.1 gives an example of one possible scenario for an aluminium sheet. It provides the various flows of scrap, metal semi-finished product and product as well as the main processes included in the system boundaries of the various modules. In this example, it is assumed that the unit of analysis is 1 kg of aluminium sheet with a recycled content of 40%, i.e. 0,4 kg of metal sheet came from recycling, while the recycling rate at end of life corresponds to 90%, i.e. 0,9 kg of recycled metal is produced at end of life. In such a case, Module D shall calculate the environmental benefits resulting from the production of 0,5 kg of recycled metal, i.e. the net difference between both recycled quantities. The next sections explain how the equation reported in Annex D of EN15804:2019 shall be interpreted and used to reflect this example and the associated flow sheet.

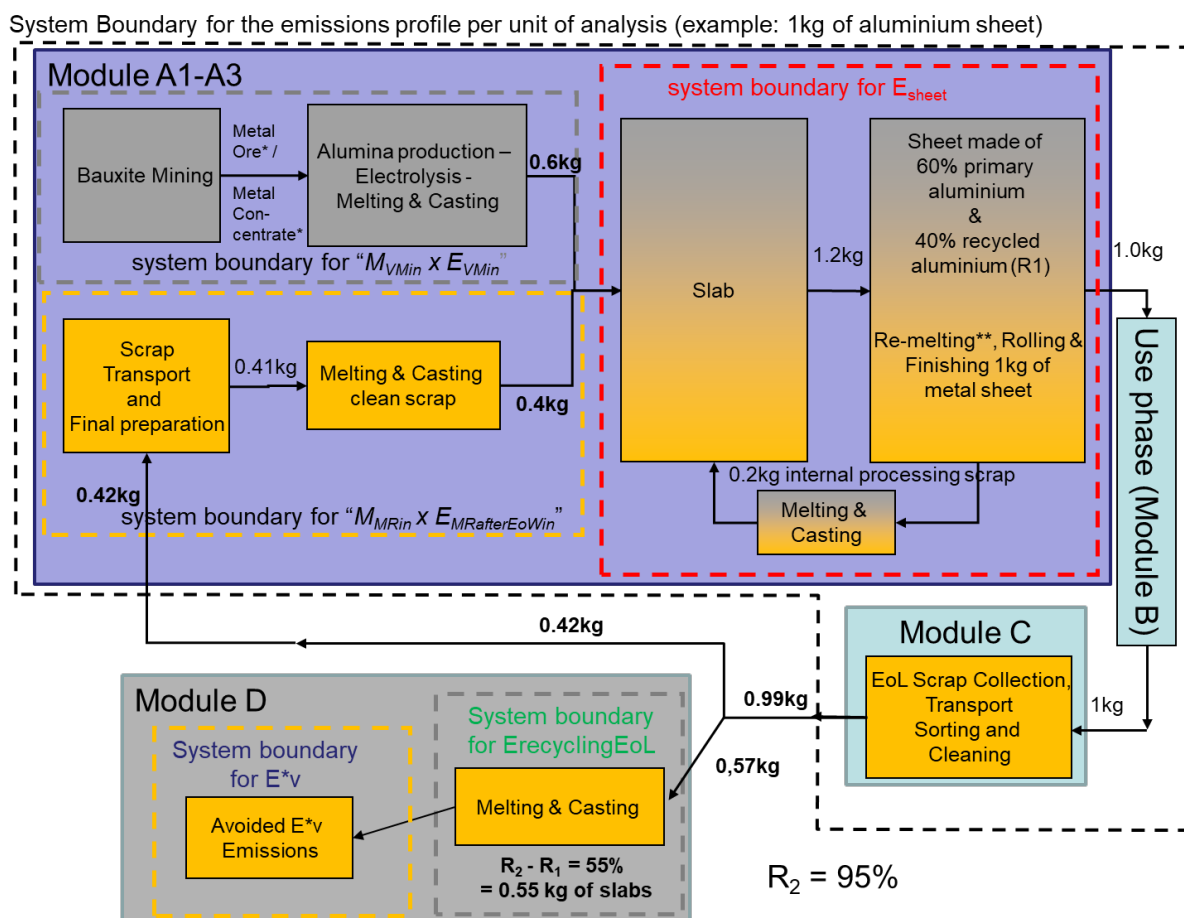




Fig. 1: Illustrative example of a flow diagram for 1 kg of aluminium sheet

The next sections aim to calculate the various information modules on basis of the informative annex D reported in EN15804:2019 and the above flowsheet diagram.

#### Module A1-A3 calculation

The applicable formula for the calculation of the emissions and resources consumed related to material resources and energy per unit of analysis for module A is the following (equation D.2 in EN15804:2019):

$$e_{\text{module A}} = e_{PE} + M_{VM \text{ in}} \cdot E_{VM \text{ in}} + M_{MR \text{ in}} \cdot E_{MR \text{ after EoW in}} + M_{ER \text{ in}} \cdot E_{ER \text{ after EoW in}}$$

Where the first term covers the impacts related to primary energy inputs, the second term covers the impacts related to material primary inputs; the third term covers the impacts related to recovered material (recycled and reused) inputs from previous products and the last term covers the impacts related to use of secondary fuels. All terms are calculated per unit of analysis. For metal products, the second and third terms are the 2 most relevant ones.

$M_{MR \text{ in}}$  represents the metal scrap input to the product system at the production stage. In our example, it corresponds to 0,42 kg of metal scrap entering the production stage. After a possible final cleaning and treatment operation, this scrap flow is melted, purified and casted in order to produce a metal ingot. These operations generate small metal losses so that the mass of the recycled ingot is slightly lower than the mass of metal scrap entering the system, i.e. 0,4 kg of recycled ingot in the example. This recycled ingot then needs to be converted into a metal sheet. Hence, " $M_{MR \text{ in}} \cdot E_{MR \text{ after EoW in}}$ " shall cover the specific emissions and resources for producing 0,4 kg of metal sheet issued from recycling. Similarly, " $M_{VM \text{ in}} \cdot E_{VM \text{ in}}$ " represents the specific emissions and resources for producing 0,6 kg of metal sheet issued from primary resources.

In practice, the point of substitution, i.e. the location in the production chain where recycled aluminium substitutes primary aluminium, is at the slab level, i.e. the ingot level. Hence, often, the LCI datasets developed by the aluminium industry cover the primary processes or recycling processes up to the ingot level. The manufacturing of the aluminium sheet from the slab is then covered by a separate LCI dataset. Hence, the equation for "Module A1-A3" can be adapted for the aluminium sheet as follows:

$$e_{\text{module A}} = (1 - R_1) \cdot E_v + R_1 \cdot E_{\text{recycled}} + E_{\text{sheet}} \text{ where:}$$

- $R_1$  percentage of recycled content of the metal sheet, i.e. fraction of metal issued from recycling
- $E_v$  specific emissions and resources consumed per unit of analysis arising from acquisition and pre-processing of primary metal in the production of the metal ingot or cathode.
- $E_{\text{recycled}}$  specific emissions and resources consumed per unit of analysis arising from sorted metal scrap recycling of the previous system into metal ingot or cathode.

- $E_{sheet}$  specific emissions and resources consumed per unit of analysis arising from the transformation of the metal ingot/cathode into the metal sheet, including the remelting of internal process scrap.

For the module A1-A3 calculation, 60% of the metal supply is issued from primary metal and 40% from recycling. Hence, the equation can be simplified as follows for the exemplary case.

$$e_{module A} = 0,6 \cdot E_v + 0,4 \cdot E_{recycled} + E_{sheet}$$

The sheet manufacturing from the metal ingot generates some internal scrap which is re-melted but does not increase the recycled content in the LCA model of the overall product, since the recycled content has already been 'fixed' in the slab production process, and the subsequent scrap generated is an internal flow in the overall product system model.

## Module C

The applicable formula for the calculation of the emissions and resources consumed per unit of analysis for module C is the following (equation D.4 in EN15804:2019):

$$e_{module C} = M_{MR out} \cdot E_{MR before EoW out} + M_{ER out} \cdot E_{ER before EoW out} + M_{INC out} \cdot E_{INC} + M_{LF} \cdot E_{LF}$$

For aluminium sheets, the first term is the most significant since it is almost entirely collected and directed to recycling. At end of life, aluminium sheets are dismantled and specifically collected for recycling. These operations take place under module C1. The collected metal sheet is directed to specialised companies for shredding and sorting (module C3). In the context of EN15804:2019, it can be considered as most appropriate that sorted metal scrap leave the system boundary and are addressed in Module D. It should be noted that there is no full harmonisation among the European countries regarding the application of the "End of Waste" status to metal scrap. Hence, from a legal perspective, the official "end of waste" status may be located at a different point in the recycling value chain.

In our exemplary case, since it is a very pure and simple product, it will be assumed that 99% of the metal sheet is collected, sorted and directed to recycling. Hence, 0,99 kg of sorted scrap exits the product system from module C3. Only a tiny fraction (1%) of the aluminium sheet is supposed to end in landfilling from the scrap preparation operations.

## Module D

As described in section 6.4.3.3 of EN15804:2019, Module D aims at assessing the benefits and loads resulting from the net flow of secondary fuels or materials exiting the product system. The environmental aspects of these flows are assessed through system expansion using the so-called "substitution methodology" or "avoided impact" methodology. In such methodology, the secondary material needs to be processed up to the point of functional equivalence where substitution of primary material takes place. In the case of aluminium sheet, the point of equivalence is the slab. Hence, module D calculation needs to consider on one side the burdens of the recycling processes up to the slab level while the benefits are calculated by the burdens of primary metal which is effectively saved. If needed, a correction factor may be applied when full substitution cannot take place, i.e. when properties are not maintained through recycling.

For metal sheet, the applicable formula for the calculation of the loads and benefits beyond the system boundary per unit of output calculated for each output flow leaving the system boundary can be restricted to Module D1 related to secondary materials for recycling (see equation D.6 in EN15804:2019). For the aluminium sheet case, only aluminium is considered. Hence the indice “i” is not necessary. As a result, the equation can be simplified as follows:

$$e_{module\ D1} = (M_{MR\ out} - M_{MR\ in}) \left( E_{MR\ after\ EoW\ out} - E_{VMSub\ out} \cdot \frac{Q_{R\ out}}{Q_{Sub}} \right)$$

- " $M_{MR\ out}$ " is the quantity of sorted scrap exiting the product system, i.e. 0,99 kg in the example.
- " $M_{MR\ in}$ " is the quantity of sorted scrap entering product system, i.e. 0,42 kg in the example.
- " $M_{MR\ out} - M_{MR\ in}$ " represents the net quantity of sorted scrap generated by the product system, i.e. 0,57 kg of scrap.
- $E_{MR\ after\ EoW\ out}$  corresponds to the specific emissions and resources arising from the recycling at end of life of the sorted scrap up to the slab. For the metal sheet case, it will be called  $E_{RecyclingEoL}$ .
- $E_{VMSub\ out}$  is specific emissions and resources consumed per unit of analysis arising from acquisition and pre-processing of the primary material from cradle to the ingot. For the metal sheet case, it will be called  $E_v^*$ .
- $\frac{Q_{R\ out}}{Q_{Sub}}$  is the quality factor between recycled ingot and primary ingot. For metals, the properties are restored through re-melting. In the building market, only a limited number of metal alloys or grades are used. In addition, collection and scrap preparation routes from end of life metal building products are well developed. These routes generate high quality scrap with low level of contamination. Hence, it can be assumed that recycled metal is of equivalent quality as the primary metal, i.e. that the quality factor is equal to one.

For the metal sheet case, the net quantity of scrap can be substituted by the difference between the recycled metal at end of life and the recycled metal content at production, i.e.  $(R_2 - R_1) \cdot 1\text{kg} = (0,95 - 0,4) \cdot 1\text{kg} = 0,55\text{ kg}$  under the condition that  $E_{RecyclingEoL}$  and  $E_v^*$  use the mass of produced ingot or cathode as the reference flow, i.e. the process output, and not the scrap input as a reference flow. In such case, the equation can be simplified as follows:

$$e_{module\ D1} = (R_2 - R_1) \cdot (E_{RecyclingEoL} - E_v^*) = 0,55 \cdot (E_{RecyclingEoL} - E_v^*)$$

Module D reports then the additional environmental benefits related to the production of 0,55 kg of recycled aluminium which correspond to the recycled aluminium produced at end of life minus the recycled aluminium used at the production stage.

#### Using datasets developed by European Aluminium

Table 1 reports the LCI datasets which can be used in the context of EN15804:2019 and building applications.

Table 1. Aluminium LCI datasets for use in EN15804:2019 (source [2])

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Module	Formula in EN 15804:2019	Simplified equation
A	$M_{VM\ in} \cdot E_{VM\ in}$ $+ M_{MR\ in} \cdot E_{MR\ after\ EoW\ in}$	$R_1 \times [\text{wrought ingot from pre-consumer scrap or clean post-consumer scrap}]$ $+$ $(1-R_1) \times [\text{primary ingot produced (or used) in Europe - cradle to gate}]$ $+$ [sheet produced from wrought ingot]
D	$\left( \frac{M_{MR\ out} - M_{MR\ in}}{E_{MR\ after\ EoW\ out} - E_{VMSub\ out}} \cdot \frac{Q_{R\ out}}{Q_{Sub}} \right)$	$(R_2-R_1) * ([\text{ingot from post-consumer scrap}] - [\text{primary ingot produced (or used) in Europe - cradle to gate}])$

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Every 5 years, *European Aluminium* develops average datasets representative for the European production or market. The latest datasets published in Feb 2018 refer to data collected for the year 2015 [2]. The datasets listed in Table 1 are included in this report, i.e.

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- [primary ingot produced in Europe - cradle to gate] (A) corresponds to the production of 1 tonne of ingot from primary aluminium, i.e. from bauxite mining up to the sawn aluminium ingot ready for delivery. This dataset includes all the environmental aspects of the various process steps and raw materials used to deliver 1 tonne of sawn primary ingot produced by the European smelters.
- [primary ingot used in Europe - cradle to gate] (B) is similar to the previous dataset but considers as well the primary aluminium which is imported into Europe and which represent 49% of the primary aluminium used in Europe in 2015. Global data from the International Aluminium institute [7] have been used for modelling the primary aluminium produced outside Europe. If the use of average European LCI datasets is appropriate, these two datasets shall be preferably used for assessing  $E_v$  or  $E_v^*$ . The choice between both datasets should then be based on the sourcing of the primary aluminium. In case of evidence of domestic European production, the dataset (A) should be used. If not, the dataset (B) should be used.
- [sheet produced from wrought ingot] This dataset corresponds to the transformation of a sawn aluminium ingot into a sheet ready for delivery to the user. This dataset includes the recycling of the scrap and chips generated during the sheet production stage and corresponds to the production of 1 tonne of aluminium sheet. This dataset can be used to assess  $E_{sheet}$
- [wrought ingot from pre-consumer scrap or clean post-consumer scrap] corresponds to the production of 1 tonne of recycled wrought ingot, i.e. slabs or billet, from process scrap or clean sorted post-consumer aluminium scrap like big aluminium pieces in the building sector or aluminium beverage cans collected through specific collection networks.
- [ingot from post-consumer scrap] corresponds to the production of 1 tonne of casting ingot from pre- or post-consumer scrap

If the use of average European datasets is adequate for the aluminium product modelling, these datasets developed by European Aluminium shall be preferably used. The use of alternative datasets should be documented and justified.

## References

- [1] Collection of Aluminium from Buildings in Europe, TU Delft study for European Aluminium Association, [available on line](#), Year 2004
- [2] Environmental Profile [Report](#) - Life-Cycle inventory data for aluminium production and transformation processes in Europe – data of the year 2015 – published by European Aluminium February 2018.
- [3] Atherton, J., ‘Declaration by the Metals Industry on Recycling Principles’, Int J LCA 12 (2006), 59-60,
- [4] ‘Recycling rates of metals’, A status report, 2nd report of International Resource Panel, Working Group on the Global Metal Flows, UNEP Report – 2011,
- [5] [Product Environmental Footprint Category Rules Guidance - Version 6.3](#) –May2018
- [6] EN 15804:2012+A2 - Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction products, 2019
- [7] Life Cycle Assessment of Aluminium: Inventory Data for the primary Aluminium Industry – Year 2015 Update, International Aluminium Institute

## ANNEX 02 - Example on how to calculate consolidated EPDs

Example: windows for a residential building requiring 20 windows in total

A residential building project requires 20 windows in total.

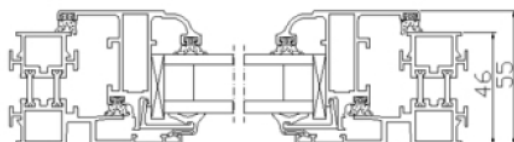
Product type	Nbre of Unit	Dimensions	RSL	Mass per unit in kg	Total in kg
Single tilt and turn window	10	Height = 1.2m * Width: 1.m	40 years	31,7	317
Double window - small	6	Height = 1m * Width: 1.6 m	40 years	44,9	269,4
Double window - Big	2	Height = 1.8m * Width: 1.4m	40 years	67,6	135,2
Horizontal sliding window	2	Height = 2m * Width: 3m	30 years	159,8	319,6
Grand Total	20				1042,2

Overall mass of the consolidated EPD: 1042,2 kg (excluding packaging materials)

Description of the various product types included in this consolidated EPD:

### 1) Single tilt and turn window

One wing with hidden fittings - 46



Product characteristics:

Window size:

Width:

1,000.00 mm

Height:

1,200.00 mm

Transparent area:

Transparent Area:

0.92 m²

Surface:

Surface treatment:

Powder coating

Total weight of the window:

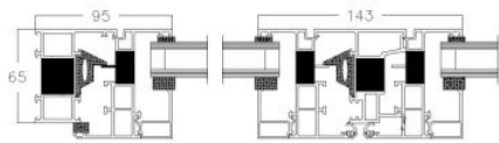
Mass:

31.67 kg



### 2) Double window - small

Profile N1



**Product characteristics:**

**Window size:**

Width:

1,600.00 mm

Height:

1,000.00 mm

**Transparent area:**

Transparent Area:

1.02 m<sup>2</sup>

**Surface:**

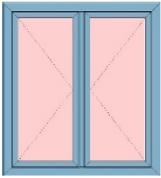
Surface treatment:

Powder coating

**Total weight of the window:**

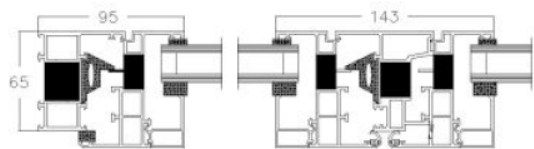
Mass:

44.86 kg



3) Double window - big

Profile N1



**Product characteristics:**

**Window size:**

Width:

1,400.00 mm

Height:

1,800.00 mm

**Transparent area:**

Transparent Area:

1.70 m<sup>2</sup>

**Surface:**

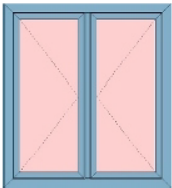
Surface treatment:

Powder coating

**Total weight of the window:**

Mass:

67.60 kg



4) Horizontal sliding window

Generic depth 110

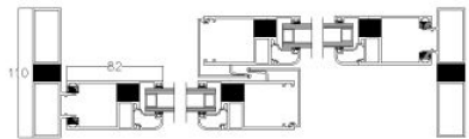


Image title

**Product characteristics:**

**Window size:**

Width:

3,000.00 mm

Height:

2,000.00 mm

**Transparent area:**

Transparent Area:

5.42 m<sup>2</sup>

**Surface:**

Surface treatment:

Powder coating

**Total weight of the window:**

Mass:

159.75 kg



Overall consolidated bill of material (in kg)

Material	Function	%	kg
Galvanized steel	Hardware	1,0%	10,78
Stainless steel	Hardware	0,6%	5,77
Aluminium profiles	Framing	25,9%	269,57
Casted Zinc	Hardware	0,2%	2,37
Casted Aluminium	Hardware	0,3%	2,70
EPDM	Insulation	2,5%	25,82
PA 6.6	Thermal break	3,1%	32,35
Polyester powder	Powder coating	0,5%	5,39
Glass	Double glazing	63,4%	660,49
Others*		2,6%	26,96
<b>TOTAL</b>		<b>100%</b>	<b>1042,20</b>

\* Others shall not exceed 5% of the overall mass

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1649 Additional materials for packaging

Material	kg
Polyethylene film	15.2
Paper film	5.1
Steel tape for packaging	2.3
<b>Total (packaging)</b>	<b>22.6</b>

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1652    **ANNEX 03 – EPD Template**

1653    **ANNEX 04 – Checklist for the verification of EPDs generated with an LCA-tool for EPDs**

1654    **ANNEX 05 – Checklist for the verification of EPDs generated without an LCA-tool for EPDs**

1655    **ANNEX 06 – Checklist for the approval of the LCA-tool for EPDs**

1656    **ANNEX 07 – Checklist for the verification of the EPD document**

1657    **ANNEX 08 – Template for the review statement**

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