



Product Category Rule (PCR) Guidance for Building-Related Products and Services

Part B: Aluminum Construction Product EPD Requirements

Publisher: UL
www.ul.com

Product Category Rules (PCR) Guidance for Building Related Products and Services Part B:
Aluminum Construction Product EPD Requirements, UL 10010 - 38

Second Edition, Dated February 16, 2022

Summary of Topics:

The First Version of the Part B: Aluminum Construction Product EPD Requirements, UL 10010–38 has been issued.

Subject to these terms and conditions and those in any other agreements between you and UL Environment, Underwriters Laboratories Inc. (UL) and/or their representatives, you are hereby granted a limited, non-exclusive, non-transferable license to use the Product Category Rules (PCR) solely for your internal, non-commercial business purposes. The PCR is not being sold, and other than the limited license

granted herein UL retains all rights, title and interest (including exclusive ownership) in the PCR and all copyright therein. UL reserves the right to regain possession of the PCR from you at any time. When no longer needed, you agree to destroy the PCR (if in hardcopy form) or delete and purge the PCR from your files (if in electronic form). No part of the PCR may be reproduced, modified, stored in a retrieval system, or transmitted in any form by any means, whether electronic, mechanical photocopying, recording, or otherwise without prior written permission of UL or UL Environment. You further agree not to create any derivative works from the PCR or remove or alter any copyright or other proprietary notices in the PCR. The limited license to use the standard shall automatically terminate upon your breach of any of the terms and conditions herein or any other agreement between you and UL, UL Environment and/or their representatives.

UL Environment provides this PCR “as is” without warranty of any kind, either expressed or implied, including but not limited to, the implied warranties of merchantability or fitness for any purpose. In no event will UL Environment, UL or any of their affiliates be liable for any special, incidental, consequential, indirect or similar damages, including loss of profits, lost savings, loss of data, or any other damages arising out of the use of or the inability to use this PCR, even if UL Environment or UL or their authorized representative has been advised of the possibility of such damage. In no event shall UL Environment’s or UL’s liability for any damage ever exceed the price paid for the license to use this PCR, regardless of the form of the claim.

Users of the electronic versions of UL Environment’s Product Category Rules agree to defend, indemnify, and hold UL Environment, ULI, their affiliates and each of their respective trustees, officers, employees, agents and representatives harmless from and against any loss, expense, liability, damage, claim, or judgment (including reasonable attorney’s fees) resulting from any error or deviation introduced while purchaser is storing an electronic PCR on the purchaser’s computer system.



Tracking of versions

Version	Comments	History
1.0	Creation of PCR Part B for Aluminum Construction Products to conform with ISO 21930:2017 and UL Part A.	February 16, 2022

© UL

This PCR is valid for a period of five (5) years, set to expire in February, 2026.

I. Background Information and Acknowledgements

These sub-category Product Category Rules (PCR) were developed to address the product specific rules for the creation of Environmental Product Declarations (EPD) for “aluminum construction products”. It includes both raw materials such as primary and secondary aluminum ingots, and all semi-fabricated aluminum that is used or sold in North America for building and construction, or as components of building and construction products. Semi-fabricated aluminum includes extruded, rolled, casted, and forged aluminum and/or their finishing operations. The scope of this PCR applies to products that can be considered as precursor inputs into other supply chains as well as components or parts of building and construction products such as doors, windows, curtain walls, facades, wall panels, sidings, roofs, gutters and spouts, renewable energy devices, etc. North America includes Canada, Mexico, and the United States. At the discretion of the Program Operator, this PCR may be applicable to other aluminum construction products not specifically described herein and not covered by other PCRs. The products within scope are collectively referenced throughout this PCR as “aluminum construction products”. When used to self-reference this document, “PCR” refers to “sub-category PCR.”

Other documents considered in the development of this PCR include:

- PCR Guidance-Text for Building Related Products and Services. Part B: Requirements on the EPD for Products of Aluminium and Aluminium Alloys. IBU. version 1.6, July 2014.
- PCR Guidance for Building Related Products and Services. Part B: Insulated Metal Panels, Metal Composite Panels, and Metal Cladding: Roof and Wall Panels 10/20
- Part A: Life Cycle Assessment Calculation Rules and Report Requirements UL Environment December 2018, version 3.2)
- The Environmental Footprint of Semi-Fabricated Aluminum Products in North America – A Life Cycle Assessment Report. The Aluminum Association. 2022.
- ISO 21930: 2017 - Sustainability in Buildings and Civil Engineering Works — Core Rules for Environmental Product Declarations of Construction Products and Services
- EN 15804:2012+A1:2013 - Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products.
- EN 15804:2012+A2:2019 - Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products.

Interested Parties

This Part B has been prepared with input from the following stakeholders:

- Aluminum Association (AA), Marshall Wang
- Aluminum Association of Canada (AAC)
- Aluminum Extruder's Council (AEC), Lynn Brown
- Carbon Leadership Forum (CLF), Stephanie Carlisle
- Groupe AGECO
- Hydro Aluminum
- Nicholson Consulting, Anna Lasso
- Metal Construction Association (MCA)
- Rio Tinto
- Sphera Solutions, Inc., Christoph Koffler
- University of Calgary

Governance

The representation from aluminum manufacturers for the creation of this Product Category Rule (“PCR”) for aluminum construction products was mainly through the participation of relevant trade associations listed in the previous section. These parties represent a majority of the aluminum industry in North America. Moreover, they represent the vast majority of the aluminum construction products sold in North America in the product categories included in this PCR. The very purpose and



function of a trade association is to inform its members of important industry developments and to represent their interests in projects such as the update of a PCR affecting their products. This is important because it effectively demonstrates that a large percentage of the aluminum construction product industry is represented in the effort to renew the PCR.

In the development of this document, Part B, participants are responsible for ensuring alignment with Part A and conformance with the scoped standards: ISO 21930, EN 15804¹, and ISO 14025.

Involvement of Interested Parties

UL Environment shall be responsible for producing the PCR document by establishing an open consultation process that includes the involvement of interested parties (ISO 21930 Section 5.2 and 6.2.1). Reasonable efforts were made to achieve a consensus throughout the process (ISO 14020:2000, 4.9.1, Principle 8 and cited in both ISO 14025 and ISO 21930), demonstrated by a vote of participating interested parties.

All participating industry associations (AA, AAC, AEC, MCA) informed their memberships of the PCR creation through their regularly scheduled association committee meetings, newsletters, e-mail messages, and similar types of outreach. Trade associations operate at the behest of its members, and the fact that trade associations are participating in the update of a PCR for aluminum construction products is an indication that their memberships are aware of this project and have authorized their association to represent them in this important endeavour.

UL Environment posted an open call for participation in this PCR update in August 2020 via its standards website, social media outlets, and PCR email distribution list.

Update Process

The PCR is valid for a duration of five (5) years from the publication date, at which time it may be revised at the request of industry stakeholders. The PCR may be revised before the five-year date if the following occurs in the industry:

- The industry desires an update
- Core governing standards ISO 14040, 14044, 14025, 21930, EN 15804 or Part A are updated with substantial material changes

Note: When the PCR is updated, the Program Operator shall communicate with the original committee, any new EPD participants, and initiate a new public call for interested parties.

Public Consultation

Public consultation was utilized during the PCR review process. The public consultation of the completed draft PCR included a minimum 30-calendar-day period for comments to be submitted to UL Environment. After public comments were submitted, the PCR committee reviewed and developed responses for all comments. All comments from the review panel and public consultation were addressed and satisfactorily resolved by the PCR committee prior to the publication of this PCR.

Review

The review process of this Part B PCR included a review through public consultation from August 27 – September 27, 2021 and a panel review, comprised of the following individuals:

Lindita Bushi, PhD, Chair
Athena Sustainable Materials Institute
lindita.bushi@athenasmi.org

James Mellentine
Thrive ESG
Jim@ThriveESG.com

Nicholas Santero, PhD, PE
Rivian Automotive
nsantero@rivian.com

¹ There are several compatibility issues with ISO 21930 and EN 15804 which are specifically noted in Part A (See Section 2.8.4.1.2). Whenever compatibility issues arise, whether addressed in this Part B or not, the requirements in ISO 21930 shall take precedence over EN 15804. If it is necessary for an EPD to explicitly conform to EN 15804 and not ISO 21930, this precedence will not apply.



II. Glossary

ALLOY

Substance having metallic properties and composed of two or more elements, so combined that they cannot readily be separated by physical means.

ALUMINUM SCRAP

Raw material, destined for trade and industry, mainly consisting of aluminum resulting from the collection and/or recovery of metal that arises as waste at various production stages; or products after use to be used for the production of wrought and cast alloys and for other production processes.

CASTING

Process in which molten metal is introduced into a mold where it solidifies.

CASTING ALLOY

Alloy primarily intended for the production of castings

CLAD SHEET/CLAD PLATE

Sheet or plate consisting of an aluminum core to which a thin layer of aluminum or another metal is metallurgically bonded on one side or on both sides, typically by rolling

COATING

Process in which a coating material is applied on a metallic substrate, including cleaning and chemical pretreatment.

NOTE 1: This term covers a one-side or two-side, single or multiple application of liquid or powder coating materials which are subsequently cured.

NOTE 2: This term also covers laminating with plastic films.

COLD ROLLED SHEET/COLD ROLLED PLATE

Sheet or plate the final thickness of which is obtained by cold rolling.

COLD ROLLING

Rolling without preheating

CONTINUOUS CASTING

Casting process in which molten metal is solidified rapidly in a cooled mold and continuously withdrawn and cut while the mold is being simultaneously replenished with liquid metal.

DIE CASTING

Casting process in which molten metal is introduced under substantial pressure, typically above 100 bars into a metal die.

NOTE: Also referred to as "pressure die casting (process)" or "high pressure die casting (process)".

DIRECT CHILL (DC) CASTING

Casting process in which molten metal is solidified in a water-cooled open-ended mold from the outlet of which water is directly applied to the emerging ingot.

EXTRUSION

Process in which a billet in a container is forced under pressure through an aperture of a die.

EXTRUSION BILLET

Extrusion ingot cut to length.



EXTRUSION INGOT

Ingot, intended and suitable for extruding, typically of solid circular cross-section, sometimes with a central hollow or a flattened cross-section.

EXTRUSION LOG

Extrusion ingot not cut to length.

EXTRUDED PROFILE

Profile brought to final dimensions by extruding.

FABRICATION

Aluminum fabrication is a forming process to transform semi-fabricated aluminum into a component or finished product. Typical aluminum fabrication techniques include precision cutting, trimming, stamping, bending, coating, and joining with other materials, etc. Examples of fabrication for building products include window manufacturing (including the preparation of components for assembly) with extruded aluminum shapes and profiles, and wall panel manufacturing with flat-rolled aluminum sheet.

FORGING

Wrought product formed by hammering or pressing, typically when hot, between open dies (hand forging) or closed dies (drop or die forging).

HEAT-TREATABLE ALLOY

Alloy which can be strengthened by suitable thermal treatment.

HOT ROLLED SHEET/HOT ROLLED PLATE

Sheet or plate the final thickness of which is obtained by hot rolling.

HOT ROLLING

Rolling after preheating.

NOTE 1: The purpose of hot rolling is typically to improve the efficiency of the rolling process.

NOTE 2: Surface finish and dimensional tolerance control of hot rolled metal are generally inferior to cold rolled metal.

INGOT

Cast product intended and suitable for remelting or forming by hot or cold working

MILL FINISH SHEET/PLATE

Sheet/plate having a finish defined by the actual roll grinding and rolling conditions, without further specification from a customer or a standard

NOTE: The finish of mill finish sheet/plate can vary from sheet to sheet or within one sheet.

NON-HEAT-TREATABLE ALLOY

Alloy which is primarily strengthened only by working and not by thermal treatment.

PERMANENT MOLD CASTING

Casting process in which molten metal is introduced by gravity or low pressure into a mold constructed of durable material, typically iron or steel.

NOTE: A permanent mold casting process where the metal solidifies in a metal mold under low pressure (typically less than 1 bar above atmospheric pressure) is also referred to as "low pressure die casting process".



PLATE

Rolled product that is rectangular in cross section and with thickness not less than six (6) mm (in USA not less than 0.250 inch) with sheared or sawn edges.

POST-CONSUMER MATERIAL

Post-consumer material is “material generated by households or by commercial, industrial, and institutional facilities in their role as end-users of the product that can no longer be used for its intended purpose. This includes returns of materials from the distribution chain”. (ISO 14021)

PRE-CONSUMER MATERIAL

Pre-consumer material is “material diverted from the waste stream during the manufacturing process. Excluded is the reutilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it”. (ISO 14021)

PRIMARY ALUMINUM

Unalloyed aluminum produced from alumina, typically by electrolysis, and with an aluminum content of 99.7%.

PRIMARY ALUMINUM INGOT

Ingot of unalloyed or alloyed aluminum cast from primary aluminum .

RECYCLED ALUMINUM INGOT

Aluminum ingot obtained by recycling of scrap.

NOTE: The term “secondary aluminum” should be avoided for this concept.

RECYCLED CONTENT

Recycled content is often used as an indicator for marketing products and is defined by ISO 14021 as “the proportion, by mass, of recycled material in a product or packaging. Only pre-consumer and post-consumer materials shall be considered as recycled content” (ISO 14021).

RECYCLING RATE

Recycling rate is defined as the percentage of the amount of materials recycled over the amount of materials generated (U.S. EPA: Measuring Recycling: A Guide for State and Local Governments). In the building and construction context, it is the percentage of the total amount of a building material recycled (at the end of life) over the total amount of the same material contained in a building.

ROLLING

The forming of solid metal in a gap between two rotating cylinders. The resulted product is sheet, plate or foil.

ROLLING INGOT

Ingot intended or suitable for rolling.

SAND CASTING

Casting process in which molten metal is poured into a sand mold and solidified.

SEMI-FABRICATION

Aluminum semi-fabrication is a forming process to transform aluminum ingots or billets into a semi-finished shape. Typical aluminum semi-fabrication processes include rolling, extrusion, forging and casting. Product of a semi-fabrication process often requires further manufacturing (fabrication, finishing, and assembly) to turn it into a final product for end use.

SEMI-FINISHED (SEMI-FABRICATED) PRODUCT

Product that has undergone some processing and is supplied for further processing before it is ready for use. Semi-finished product may be surface treated and/or coated.



NOTE: Semi-finished products include wrought products and castings. It does not include ingots and billets.

SHEET

Rolled product that is rectangular in cross section with nominal thickness less than 6 mm (in USA less than 0.250 inches [6.3 mm]) but not less than 0,20 mm (in USA greater than 0.006 inches [0.15 mm]) and with slit, sheared or sawed edges.

TRADED SCRAP

Scrap that is traded on the market.

NOTE: Traded scrap typically meets requirements on characteristics agreed upon between supplier and purchaser.

UNWROUGHT PRODUCT

Product obtained by casting without further hot or cold working, e.g. ingots for rolling, ingots for extruding, ingots for forging, ingots for remelting, cast plate or castings.

WROUGHT ALLOY

Alloy primarily intended for the production of wrought products by hot and/or cold working

WROUGHT PRODUCT

Product that has been subjected to hot working and/or cold working.