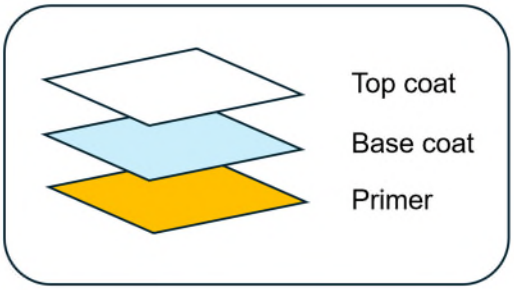
Part B: Product group definition | Powder coatings | Part B #25-006

Initiated by	American Coatings Association (ACA) - https://www.paint.org/		
Working group members	Jim Mellentine, Thrive ESG (PCR committee chair) Karen Bab, American Coatings Association (ACA) Annebelle Klein, American Coatings Association (ACA) Heidi McAuliffe, American Coatings Association (ACA) David Saucier, Canadian Coatings Association (CCA) Michael Bollan, Axalta Coating Systems Shiva Zargar, Build Neutral Inc. Joe Byrom, Hentzen Coatings Sarah Meagrow, NSF Asifur Rahman, SCS Global Services Seth Jackson, Sherwin-Williams Ramin Ghamkhar, Sherwin-Williams Nick Welton, Sherwin-Williams Eugene Schneider, TCI Powder		
Public notices of development/ outreach	• Public notice on the Sustainable Minds website announcing the update to the PCR on June 2, 2025: http://www.sustainableminds.com/transparency-report-program/part-b • Email blast on June 2, 2025 to mailing lists of LCA professionals, building and construction industry and trade associations, and manufacturers of powder coatings, requesting participation on the PCR committee. • Email blast on November 17, 2025 to the same mailing lists requesting public comment.		
Non-participating parties	All interested parties who requested participation were invited to join the working group.		
New Part B?	No	**Part B version number**	2.0
Publication date	December 18, 2025		
Validity period	12/18/2025 – 12/17/2030		
Expected renewal schedule	Sustainable Minds intends to notify the working group and post update/renewal information on its website approximately four months prior to expiration to determine update, extension, or expiration options for this Part B.		

Product group

Name	Powder coatings	**CSI MasterFormat® #**	09 96 00 High-performance coatings 09 97 00 Special coatings 09 01 90 Maintenance of Painting and Coating 05 05 13 Shop-Applied Coatings for Metal 06 05 83 Shop-Applied Wood Coatings
Description	Powder coating products for interior and exterior applications		
Exclusions	The scope excludes: • Coatings which may be used on similar substrates but are not 100% solids • Coatings that fall under the most recent PCR for architectural coatings		
Geographic representativeness	This PCR is applicable for products sold in North America. Products with different geographic representativeness as above may specify the use of this PCR, and describe their reasoning for selecting this PCR, as their underlying EPD methodology. Examples include (1) lack of a more relevant PCR, (2) product not sold in North America, but a global or national industry association prescribes the manufacturers to use this PCR, etc.		
Product-specific terms	For the purposes of this PCR, a powder coating is defined as a 100% solids coating applied as a dry powder which, when baked at a sufficient temperature, melts out to form a continuous film. Powder coatings can be further classified by these subcategories: • Single-layer product • Multiple-layer systems Powder coatings shall be assessed as a single-layer product, as opposed to a multiple-layer system. For example, some powder coatings may be made up of at least a base coat and a top coat. As such, EPDs shall consider the base coat or top coat in separate individual EPDs. An		

	example of a powder coating system is shown in Figure 1. Powder coatings are also unique from conventional coatings (i.e., paints) in that they are not site-applied, are applied primarily by downstream companies (e.g., furniture) instead of being purchased by a customer in the store, and have a wider variety of uses and applications.  **Figure 1.** Example of a powder coating system with three layers **Additional terminology** • **Adhesion:** The degree of attachment between two surfaces held together by interfacial forces • **Base coat:** Coating applied to the surface after preparation and before the application of a top coat • **Pigment:** The material that gives a coating its color • **Primer:** Material applied to a surface to promote adhesion between the substrate and subsequent coats • **Resin/binder:** Acts as the glue or adhesive to adhere the coating to the substrate • **Top coat:** The final layer of coating put onto a surface over another layer

Program operator responsibilities

Existing PCRs, EPDs, TRs, or LCAs	• This Part B shall be used in conjunction with the latest version of Sustainable Minds Part A: LCA calculation rules and report requirements (version 2023 at the time of publication of this Part B; newest version shall be used when available) • Relevant PCR: IBU: Product Category Rules (PCR) Guidance for Building-Related Products and Services Part B: Coatings with organic binders (version 7) • Relevant PCR: NSF: Product Category Rule for Environmental Product Declarations: PCR for Architectural Coatings (version 2, with three extensions) • Existing EPDs used as references to inform some aspects of this Part B: o PPG EPD for Envirocron® 03 and 04 https://info.nsf.org/Certified/Sustain/ProdCert/EPD10700.pdf o Sherwin-Williams EPD for POWDURA® 5000 https://info.nsf.org/Certified/Sustain/ProdCert/EPD10426.pdf
Justification for new Part B if relevant non-expired PCR exists	Several members of the original PCR Committee for the previous version of the NSF PCR for powder coatings expressed interest in updating the PCR according to the newest standards and practices. See harmonization activities below.
Harmonization activities pursued	Sustainable Minds announced the creation of this product group definition to the original PCR Committee members, other program operators, LCA analysts, and manufacturers via email, and posted an update on its website. The previous version of the PCR for powder coatings was found to have its validity period extended through April 2026, with the following note: “This PCR is being revised; when published, the latest version of the PCR supersedes this extension.” Sustainable Minds reached out to the original program operator, who confirmed that they would end the validity period of that extension upon publication of this Sustainable Minds Part B. Other PCRs for coatings were reviewed, and none were available specific to powder coatings, which are different in terms of manufacture and application relative to conventional liquid coatings.

Functional performance

Standard/certification (most recent edition, conformance not required for PCR conformance)	**URL**
Powder Coating, Camouflage Chemical Agent Resistant Systems – **MIL-PRF-32348**	https://quicksearch.dla.mil/qsDocDetails.aspx?ident_number=277552
Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels – **AAMA 2603-22**	https://store.fgiaonline.org/aama-2603-22/
Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels – **AAMA 2604-22**	https://store.fgiaonline.org/aama-2604-22/
Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels – **AAMA 2605-22**	https://store.fgiaonline.org/AAMA-2605-22/
Organic Coatings for Steel Enclosures for Outdoor Use Electrical Equipment – **UL 1332**	https://www.shopulstandards.com/ProductDetail.aspx?UniqueKey=30657
Coating powders, Part 1: Determination of particle size distribution by sieving – **ISO 8130-1:2019**	https://www.iso.org/standard/68393.html

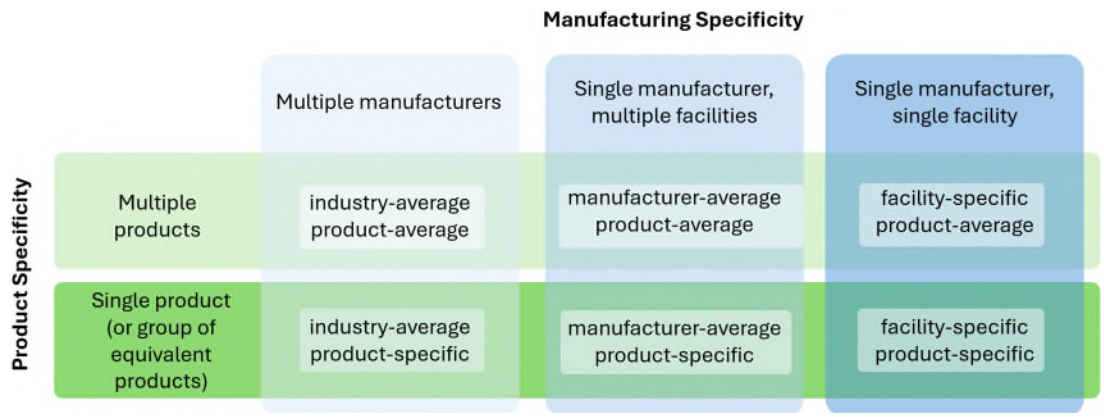
System boundary

System boundary	The type of EPD shall be specified as cradle to gate. The modules considered in the LCA shall be described in brief as per “System boundaries” outlined in ISO 21930:2017 section 5.2, and the system boundary shall follow both the modularity and polluter pays principle, discussed in greater detail in Section 7.1.1 and Table 1. While it is unclear whether capital goods and infrastructure are significant to the overall impacts of the products, it is known that they are quantified inconsistently, varying based on the secondary data sets used and the database. To reduce possible artificial variation in EPD results across the product group, capital goods and system infrastructure flows shall be excluded from the system boundary by default, with justification required for alternative assumptions. In addition, personnel impacts, research and development activities, business travel, and any secondary packaging such as pallets or shrink wrap shall be excluded, as they were determined by internal LCAs conducted by ACA member companies to represent a negligible environmental impact in the overall life cycle performance of a coating.

Declared unit

Unit	**1 kg of powder coating product/layer**
Rationale	Due to variable applications and use cases, mass is the most convenient and useful method of presenting results for products in this category.

Additional rules for comparability

1. TR/EPD types	

	All EPD types may be created from this PCR (single or multiple facilities or manufacturers, representing a single product or multiple products). For industry-average EPDs, refer to the industry-average EPD additional rules section. For product-average or manufacturer-average EPDs, a weighted average of production volumes for each product type or each facility shall be used.
2. Additional rules to Part A	• EPDs shall disclose the LCA software and version used for modeling, and the database name(s) and version(s) used. • EPDs that use secondary data for any unit process that contributes 15% or more to any disclosed environmental impact category shall disclose the data source (database name and version, LCA modeling software type and version implemented, data set name, data set geography, data set age, and data set allocation method). This criterion applies to the LCI being used, and not the actual unit process data being reported by the manufacturer. Materials considered confidential may be reported as “proprietary ingredient” along with the database name and version. • While total impact category indicator results for the entire product system shall be reported, EPDs may additionally report impact category indicator results by individual coating layer if desired. • EPDs shall disclose the following information for each covered product: o Particle size distribution o If multiple products are disclosed, the relative application amounts per layer (ratio by mass) shall be disclosed • EPDs may disclose the following additional information if relevant to the product: o Information about coating recycling or reuse o Information about building product performance (related to gate-to-grave environmental effects) o Instructions and limits for efficient application or use o Organization’s adherence to any environmental management system, including a statement showing where an interested party can find additional information on the system o Other environmental certification programs applied to the building product and a statement on where an interested party can find details of the certification program o Other environmental activities of the organization, such as participation in recycling or recovery programs, provided details of these programs are readily available to the purchaser or user and contact information is provided o Preferred waste management option for unused coating • In addition to the environmental impact indicators required by Part A, global warming shall be additionally reported using the latest factors published by the United Nations Intergovernmental Panel on Climate Change (IPCC) which are available in the LCA modeling software used. • Only one product/layer result may be included in a single EPD.
3. Default life cycle stage scenario(s)	**Extraction and upstream production (A1)** When materials used in the product are represented by secondary data, the electricity grid profile of the data set should be adapted to the source country or region, if known and possible with the selected data set. Average data sets with “Global” or “Rest of World” average electricity profiles may only be used if the material source location is unknown or adapting the electricity grid is not possible. In cases when the EPD owner purchases manufactured components, the manufacturing process activity at the upstream supplier shall be counted in the extraction and upstream production stage, separate and in addition to the upstream raw material extraction. For example, if a manufacturer purchases titanium dioxide pigment, the pigment cannot be simply represented by titanium dioxide ore alone. Additional manufacturing must be added to represent the manufacturing of ore into pigment. The upstream supplier location and potential scrap rate during the manufacturing process activity should be considered. **Transport to factory (A2)** All transportation including inter-facility transport prior to the material being shipped to the production site shall be included. Actual supplier locations shall be used to determine transport distances, when known. In cases where the EPD owner maintains multiple suppliers for the same material or part, the life cycle inventory and impact assessment results shall reflect a weighted average transportation distance from the multiple suppliers for each mode of transport used. To simplify the calculation for those with many suppliers for the same material or part, suppliers which provide less than 5%, by mass or by volume, of a particular material or part may be excluded from the calculation of weighted average transport distance, subject to existing cut-off requirements in SM Part A. If the location of a material/part supplier is unknown, transport distances listed in Table 1 shall be used for inbound raw material transportation to facilities located in the United States. For processes outside of the United States, appropriate regional or national transportation distances and mode(s) shall be used where primary data is unavailable.

Table 1. Material transportation distances to production site to be used in the absence of primary data

Raw material / classification grouping	Rail	Truck	Sea
Raw coating materials Any material used in a coating where no primary source data is available	579 miles (932 km)	412 miles (663 km)	525 miles (845 km)
Plastics (for packaging) Polymer-based materials, excluding textiles	592 miles (953 km)	332 miles (534 km)	842 miles (1,355 km)
Steel (for packaging) Base metal in primary or semifinal forms and in finished basic shapes	550 miles (885 km)	390 miles (628 km)	95 miles (153 km)
These distances are from Table 21 Geographic Area Series: Shipment Characteristics by Origin Geography by Destination Geography by Commodity by Mode: 2017 as referenced from The 2017 Commodity Flow Survey Tables: https://data.census.gov/cedsci/table?q=cf1700a21&hidePreview=true&tid=CFSAREA2017.CF1700A21 NOTE: Truck distances represent round trip distances, as the assumption is made that the delivery truck returns empty after making the delivery. NOTE: The 2017 version of this dataset was used instead of 2022 because the latest version specifies great circle distance instead of routed distance, which is considered less accurate for this application.			

Manufacturing (A3)

Carbon offsets shall not be considered in the inventory. These refer to credits purchased for processes not under the control of the purchaser. For example, a coal fired power plant might buy carbon credits that support the planting of forests. While these activities can be accounted for on a corporate level, they shall not be applied to the product LCA or EPD.

Market-based renewable electricity purchases (including renewable electricity certificates (RECs)) may be considered in the inventory. RECs cannot be applied disproportionately to individual products. Otherwise, disclosure of results considering market-based renewable electricity purchases shall follow the most recent Sustainable Minds PCR Part A.

On-site renewable electricity may be included in the inventory if renewable electricity certificates (RECs) generated by the installation are kept/owned by the manufacturing facility. In such cases, the electricity shall be allocated to all products made at the facility (i.e., not disproportionately to a subset of products), unless the renewable installation is specifically connected to a portion of the plant and supported with submetering data.

Primary packaging, such as bags or containers used to package the powder coatings, shall be included.

In the absence of primary data, the transport distance from the production site to waste processing or disposal shall follow the latest version of the US EPA WARM model (20 miles (32.2 km) as of this writing). Outside of the United States, other appropriate regional or national assumptions may be used.

For products that contain biogenic content, the calculation and reporting requirements in ISO 21930:2017 section 7.2.7 shall be followed.

Additional LCA calculation rules

N/A	Optional	Required	*Indicate whether conformance is the manufacturer's choice or required for TRs/EPDs.*
		X	ISO 21930:2017: conformance is required by construction product manufacturers

Industry-average EPD additional rules

Minimum participation	A call for participation in an industry-average EPD shall be published in at least one industry trade publication and newsletter (if available). Direct outreach via email to interested parties as well as posting on commonly read industry social media is also encouraged. The minimum required level of market participation is 3 manufacturing companies. Each participating manufacturer shall provide primary manufacturing data. The industry-average EPD shall reflect production weighted-average of participating manufacturers and shall disclose the approximate percentage of market participation as a share of the 2024 (or latest) sales data from the Powder Coating Institute, which is 12,735,000 kg in 2024.

Retroactive pathway requirements	One or more additional manufacturers who did not participate in the original industry average EPD may be retroactively added to the EPD prior to the EPD's original expiration under the following conditions: • The industry average EPD's numerical results may only be updated if two or more retroactive participants' data is integrated at the same time, or if an existing participant desires to submit updated data in conjunction with the addition of one or more new participants' data. This is to reduce the potential for reverse-engineering the impacts of an individual company based on the changes made. o If numerical results are updated within the first year of initial publication, the EPD validity date may be extended by the same amount of time as the update. Otherwise, the validity date shall remain the same as the original publication. If this requirement conflicts with program operator rules, then the program operator's rules shall be followed. • A single company may be retroactively added to the EPD if the LCA practitioner of the original EPD models the company's inventory data (under a non-disclosure agreement if necessary) and confirms none of the EPD indicator results would change by more than 5%. In this case the company's name may be added as a participant in the EPD without updating the numerical results. o If the company's data would change any of the existing EPD indicator results by more than 5%, the update must wait until either another company is able to retroactively participate, an existing participating company desires to submit updated data, or upon the next regular update of the EPD with all participating manufacturers submitting updated data. The costs to update the industry average LCA and EPD are expected to be borne by company(ies) initiating and/or participating in the update (to be confirmed by involved parties).
Governance	Data submitted for the industry-average EPD shall be collected by a party independent of the participants and sponsor(s) of the EPD. The responsible party will be responsible for secure storage and analysis of the participants' data. The responsible party shall only share aggregated data with the participants and sponsor(s) of the EPD to protect confidential information of the participants. Companies eligible for participation in the EPD study shall be allowed to attend project meetings for which all participants are invited, regardless of whether the company decides to participate in the EPD. Also refer to ISO 21930 for more information about EPD ownership and responsibilities.
EPD updates	Updates to the industry-average EPD shall be made prior to the original end of the validity period if there are 1) significant operational changes among the participants (e.g., technology, regulatory, or other changes that affect the efficiency of operations, method of manufacturing, the magnitude of input and output inventory flows, etc.), 2) Retroactive participants (see above), 3) significant changes to the industry supply chain, or 4) significant changes to scenario assumptions downstream of the manufacturing process. The EPD sponsor(s) and/or participants shall notify the Program Operator of any changes that could result in significant changes to the disclosed environmental performance results of the EPD. A significance threshold of 10% applies to these changes. The EPD owner(s) are responsible for determining whether this threshold has been reached.
Comparison of company-specific EPDs to industry-average EPDs	The participants of the industry-wide EPD will determine the method used to determine quantitative uncertainty (e.g., Monte Carlo method). To demonstrate improvement, company-specific EPD results must be statistically significantly lower than the industry-wide EPD results, with a confidence interval of 95%. Any improvement or reduction that is not statistically significantly lower or higher than the benchmark, with a confidence interval of 95%, is considered equivalent to the benchmark. *LCIA method & version # used for comparison:* All comparisons to the industry-average results must use the same impact assessment characterization method and version number as the industry-wide study. *Threshold of performance improvement:* Claims of improvement shall show at least 10%+ reduction in global warming and at least 5%+ reduction in two or more additional impact categories

Part B development information

Part B review panel	This Part B was reviewed for conformance to ISO 14025 and ISO 21930:2017 by the following parties: Thomas P. Gloria, Ph. D., Chair Industrial Ecology Consultants t.gloria@industrial-ecology.com Jack Geibig Ecoform Jgeibig@ecoform.com C. Jason Pierce Blue Ridge Sustainability blueridgesustainabilityllc@gmail.com
Open consultation	Sustainable Minds solicited public comments on this Part B from 11/17/2025 – 12/17/2025. This consultation period and list of parties to submit comments were made available to the review panel.
Update justification	This Part B was updated upon consideration of manufacturers looking to create new EPDs beyond the validity period of the previous version of the PCR.
Conflict statement	Funding sources used to develop this Part B were disclosed to the working group during the development process. The policies identified in Sustainable Minds' Program Governance were followed to identify and resolve any potential conflicts of interest.
Sustainable Minds information	This Part B was developed by Sustainable Minds and participating interested parties according to the Sustainable Minds Program Governance available at http://www.sustainableminds.com/transparency-report-program/how-it-works. For questions about this or another Part B, to submit comments on this Part B, or to obtain a template for developing a transparency report, contact us using the information on the following page: http://www.sustainableminds.com/contact-us.

Part B revision history

Version	Change log
1.0	May 2020: Original, published by NSF (https://www.nsf.org/nsf-standards/product-category-rules)
Extension	March 2025: 12-month extension by NSF with no additional changes
2.0	Dec 18, 2025: Updated upon anticipation of expiration of the extended v1.0. Made updates as suggested by the PCR committee along with other best practice assumptions, including: • Addition of applicable CSI sections • Geographical representativeness designated as being for products sold in North America • Listing of PPG and Sherwin-Williams EPDs used as references to inform some aspects of the Part B • Addition of applicable product performance standards MIL-PRF-32348, AAMA 2603-22, AAMA 2604-22, AAMA 2605-22, UL 1332, and ISO 8130-1:2019 • The following disclosures in the EPD were changed from required to optional: coating recycling or reuse information, building product performance information, instructions and limits for efficient application or use, adherence to environmental management systems, other environmental certification programs, other environmental activities, and preferred waste management options for unused coatings • Disclosure of GWP using the latest version published by IPCC, in addition to latest TRACI indicators • Allowance for RECs to be included, following the requirements in the most recent version of the REC addendum to the ACLCA PCR Open Standard, with on-site renewable electricity applying to all products made at the facility unless sub-metered and as long as any RECs generated were kept by the facility • A2 default transportation distances updated to 2017 US DOT data and specified for the United States only • Addition of clarifying statement that biogenic carbon reporting shall be per ISO 21930:2017 • Requirement to disclose in the EPD which data sets were used to represent any unit process that contributes 15% or more to any disclosed environmental impact category • Allowance for the creation of an industry-average EPD and definition of additional rules