



CRADLE TO CRADLE CERTIFIED™ PRODUCT STANDARD

VERSION 4

SECOND DRAFT FOR PUBLIC COMMENT

The following draft documents are provided within this document and are available for comment:

1. Cradle to Cradle Certified Product Standard, Version 4
2. Reference documents for the Cradle to Cradle Certified Product Standard, Version 4
 - a. Restricted Substances List (RSL)
 - b. Volatile Organic Compound (VOC) Emissions Testing
 - c. Volatile Organic Compound (VOC) Content Testing
 - d. Water & Soil Stewardship Key Materials

Click the links above to go directly to that section.

NOTE: The following two standard reference documents are Excel files available for download via the C2CPII comment platform:

- a. Required Percentages of Cycled and Renewable Content by Product and Material Type
- b. Circularity Data Report & Cycling Instructions

Click the links above to download the files.



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*Approved by the Cradle to Cradle Products Innovation Institute Certification Standards Board
26 May 2020*

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For more information about the Cradle to Cradle Products Innovation Institute and the Cradle to Cradle Certified Products Program, visit www.c2ccertified.org.

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FOREWORD

The Cradle to Cradle Products Innovation Institute (C2CP II) is an independent, nonprofit organization dedicated to maximizing the positive impacts of products and materials. As the standard setting and certification body for the Cradle to Cradle Certified™ Product Standard, C2CP II works closely with leading organizations worldwide to guide and validate their efforts to apply the principles of material health, product circularity, clean air and climate protection, water and soil stewardship, and social fairness to product design and manufacturing. The standard provides designers, manufacturers, and suppliers with a framework for continually improving what products are made of and how they are made. Cradle to Cradle Certified is a respected mark of products and materials made for the circular economy.

The official language of the Cradle to Cradle Certified Products Program is English and this standard document is to be considered the official language version.

Further information about C2CP II and the Cradle to Cradle Certified Product Standard is available at www.c2ccertified.org.

Inquiries regarding C2CP II and the Cradle to Cradle Certified Product Standard may be directed to info@c2ccertified.org or emea@c2ccertified.org.

1 // INTRODUCTION

1.1 History and Background

In 2005, MBDC created the Cradle to Cradle Certified Products Program to acknowledge the high levels of sustainability achieved by its clients in developing products based on Cradle to Cradle® design principles, and to inspire others to optimize their products and “rethink the way they make things.” MBDC released version 1.0 of the Cradle to Cradle Certified Product Standard in 2005 and version 2.0 in 2008.

In 2010, William McDonough and Dr. Michael Braungart created the Cradle to Cradle Products Innovation Institute (C2CPPI), a 501(c)(3) nonprofit organization, to scale Cradle to Cradle certification globally. In 2012, C2CPPI took over administration of the Cradle to Cradle Certified Products Program from MBDC and began to independently certify products. Following the release of version 3.0 of the standard, which was developed by MBDC and launched by C2CPPI in January 2013, C2CPPI took over development and maintenance of the Cradle to Cradle Certified Product Standard. C2CPPI is now established as a fully independent nonprofit organization with ownership of the Cradle to Cradle Certified Products Program and exclusive authority over the development of the standard and the administration of certification. The founders continue to serve as nonvoting, honorary advisors to the C2CPPI Certification Standards Board.

1.2 Standard Development

Since its launch in 2005, the Cradle to Cradle Certified Product Standard has been evolving to address a greater understanding of the environmental and human health impacts of the design, manufacturing, use, reuse, and disposal of materials, advances in best practices and technology, and its application to a wider variety of product and material types. Ongoing improvements to the standard are developed by C2CPPI staff, volunteer committees, and external subject matter experts under the direction of the C2CPPI Certification Standards Board, as detailed in the *Process for Development of the Cradle to Cradle Certified Product Standard*. Updates to the standard requirements and development of new versions of the standard are subject to review and approval by the C2CPPI Certification Standards Board under the supervision the C2CPPI Board of Directors. The development process is based on principles of transparency, openness, and inclusiveness.

1.3 The Cradle to Cradle Certified Product Standard, Version 4

The vision of C2CPPI is a world where safe materials and products are designed and manufactured in a prosperous, circular economy to maximize health and wellbeing for people and planet. C2CPPI's

mission is to lead, inspire, and enable all stakeholders across the global economy to create and use innovative products and materials that positively impact people and planet.

1.3.1 Standard Requirement Categories

The standard requirements are based on the Cradle to Cradle® design principles outlined in William McDonough and Michael Braungart's 2002 book, *Cradle to Cradle: Remaking the Way We Make Things*, and provide guidance in five key categories. These requirement categories and their intended outcomes are listed below.

Material Health – Chemicals and materials used in the product are selected to prioritize the protection of human health and the environment, generating a positive impact on the quality of materials available for future use and cycling.

Product Circularity – Products are intentionally designed for their next use and are actively cycled in their intended cycling pathway(s).

Clean Air and Climate Protection – Product manufacturing results in a positive impact on air quality, the renewable energy supply, and the balance of climate changing greenhouse gases.

Water & Soil Stewardship – Water and soil are treated as precious and shared resources. Watersheds and soil ecosystems are protected, and clean water and healthy soils are available to people and all other organisms.

Social Fairness – Applicant companies are committed to upholding human rights and applying fair and equitable business practices.

1.3.2 Certification Requirements and Levels

The Cradle to Cradle Certified Products Program is based on the concept of continuous improvement and thus there are four possible levels of achievement within each of the standard's five key requirement categories: Bronze, Silver, Gold, and Platinum. To reach a desired achievement level within each category, the product must meet all of the requirements for that level, in addition to the requirements at all lower levels.

Certification is awarded to a product when it meets the requirements for the desired achievement level in each of the five categories (Sections 4-8), the general requirements (Section 3), the packaging requirements (Section 9), and the product and material type-specific requirements (Section 10, if applicable). The product's overall certification level is equal to the lowest level achieved in the five categories (Bronze, Silver, Gold, or Platinum).

The product's certification level, along with a scorecard indicating the level achieved in each of the five categories, is stated on the Cradle to Cradle certificate and in the Cradle to Cradle Certified Products Registry on the C2CPH website (www.c2ccertified.org).

1.3.3 Bronze Level is a Provisional Certification

At the Bronze level, a product is starting out on the path to Cradle to Cradle certification. A company must conduct an inventory of the materials used to make the product, energy use, water and soil stewardship, and social fairness issues affecting their industry and production region. The company must also define optimization strategies and take initial steps towards the development of circular products and responsible manufacturing practices. The Bronze level of certification is designed to recognize a company's intent to improve the way their product is made, establishing a commitment to ongoing assessment and optimization.

As such, the Bronze level certification is a provisional certification. A product may be certified only once at the Bronze level, and must recertify at the Silver level or higher once the two-year Bronze certification has expired, or it will be delisted from the program.

1.3.4 Product Types Not Eligible for the Bronze Achievement Level in Material Health

Children's products, cosmetics, and personal care products are not eligible for certification at the Bronze achievement level in the Material Health category (i.e. they must meet the Silver achievement level requirements or higher in Material Health) to ensure they do not contain carcinogens, mutagens, or reproductive toxicants (CMRs); persistent, bioaccumulative, and toxic substances (PBTs); very persistent and very bioaccumulative substances (vPvBs); or substances that cause an equivalent level of concern.

1.4 Supporting Documents

C2CPH develops and maintains documents to support implementation of the Cradle to Cradle Certified Product Standard, including User Guidance, Material Health assessment methodologies, and other standard reference documents. These documents are meant to educate and provide the necessary information for the certification community to have a robust understanding of the standard. These supporting documents are regularly updated to reflect the improvements made to the standard.

2 // PRODUCTS ELIGIBLE FOR CERTIFICATION

2.1 Product Eligibility

The Cradle to Cradle Certified™ Products Program applies to products. For certification purposes, a ‘product’ is defined as any physical item that can be routinely and individually purchased from the certification applicant by other entities. This definition includes materials, sub-assemblies, and finished products.

Please see the Cradle to Cradle Certified Products Registry on the C2CPH website for a complete listing of all currently certified products. To determine the eligibility for a product type that is not currently certified, please contact C2CPH before submitting a certification application or beginning a product assessment. C2CPH reserves the right to refuse to certify a product type for which the standard is not currently designed to certify, or is determined to not align with C2C principles in its sole discretion.

For a list of product types that are not eligible for certification, see Section 2.2.

2.2 Products Not Eligible

The following product types are not eligible for Cradle to Cradle certification:

1. Products that are contrary to the intent of the Cradle to Cradle principles, including:
 - a. Weapons or other items intended to harm, kill, hurt, or incapacitate living beings (e.g. guns, tasers, mace, barbed wire, electric fencing),
 - b. Tobacco and other products intended or used for smoking or vaping (e.g. pipes),
 - c. Products used exclusively to produce non-renewable fuel or electricity (nuclear reactor equipment, fracking fluid, oil rigs, etc.),
 - d. Products that consume nuclear or non-renewable fuel (e.g. gasoline car; does not apply to electricity purchased from the grid or to plugged products),
 - e. Products and products containing material from threatened, vulnerable, or endangered species (e.g. African mahogany (*Khaya spp.*), Brazilian rosewood (*Dalbergia nigra*), Rhodesian teak (*Baikiaea plurijuga*); see the Definitions section for the definition of threatened, vulnerable, and endangered),
 - f. Products and products containing:
 - i. Material and substances derived from vertebrates, and invertebrates where there is clear evidence of sentience (e.g. cephalopods), that are killed primarily or only for their hides, skins, feathers, or other fibers and parts (e.g. snake, crocodile, alligator, lizard, and galuchat/stingray skins),

- ii. Down, feathers, or hair from any live plucked animal (e.g. ducks, geese) and substances derived from these materials,
 - iii. Fur, including when the fur is shorn or otherwise removed from the hide or skin. (e.g. fox, mink, beaver, ermine, and rabbit including angora rabbit fur/wool).
 - g. Products that are chemicals or raw materials that cannot be optimized (e.g. monomers that are carcinogens, mutagens, and/or reproductive toxicants (CMRs),
 - h. Products for which the core functionality is intrinsically tied to toxic active ingredients, thus rendering the product non-optimizable (e.g. herbicides, insecticides, rodenticides, and antimicrobial products with x-assessed antimicrobial agents) or textiles/apparel with such products intentionally added.
 - i. Disinfectants (including those used for human hygiene) containing active ingredients/substances that are not approved for use per leading regulations. This is defined as disinfectants containing substances that are not approved for use in the relevant product type per the European Union's Biocidal Products Regulation (e.g. antimicrobial cleaning products, soaps, or hand sanitizers/hand rubs with triclosan or triclocarban).
 - j. Products that are designed/intended to be non-circular or promote non-circularity:
 - i. Single-use plastic products (e.g., cotton buds/swabs, cutlery, plates, cups, straws, stirrers, balloons, food and beverage containers, bags, wet wipes, and sanitary items). An exception to this is food wrappings and food waste bags with a thickness of < 50 microns intended for composting.
 - ii. Oxo-biodegradable additives and plastics containing these additives,
 - iii. Plastic microbeads and products containing plastic microbeads, and
 - iv. Products marketed as/for throw-away (e.g. products with the terms “waste” or “garbage” in the product name, or products intended for landfill or incineration).
 - k. Packaging for any product type that is contrary to the intent of the Cradle to Cradle principles and thus not eligible for certification.
2. Products that the program requirements were not written to address, including:
- a. Food, beverages, and other products intended for ingestion,
 - b. Pharmaceuticals, including products and substances for which claims of a pharmaceutical nature are made; see the Definitions section for the definition of pharmaceutical.
 - c. Medical devices for which specialized biocompatibility testing is required that is not included in the Cradle to Cradle Certified Material Health Assessment Methodology (e.g. syringe, pacemaker, etc.),

- d. Products that are or contain live multicellular organisms (e.g. live animals, plants, seeds),
 - e. Fuels and other products intended for combustion during use (e.g. candles, fireworks, explosives), and
 - f. Buildings.
3. Products that are not in compliance with applicable laws and regulations.

Note: Some requirements in the standard address activities that are also subject to regulation by local, state, or federal authorities. However, nothing contained in the Cradle to Cradle Certified Product Standard changes legal regulatory requirements or prescribes how compliance is to be achieved. Demonstration of compliance with certain key regulations is required in some sections of the standard, but this in no way changes the underlying regulatory requirements.

3 // GENERAL REQUIREMENTS

3.1 Certification Compliance Assurance

Intended Outcome(s)

A compliance assurance system is in place to ensure the certification requirements are met at all times.

Applicable Achievement Level(s)

Bronze

Requirement(s)

A documented certification compliance assurance system is in place.

The certification applicant/holder must have a documented certification compliance assurance system in place that includes:

1. Designated staff responsible for maintaining the integrity of certified product(s) as defined by the standard.
2. A process for controlling for changes pertinent to the certification and notifying the certification body when relevant changes are planned or otherwise identified. Pertinent changes include, but are not limited to, changes to certified product names or group names, and the list of specific product variations included in or excluded from a certified group.
3. A method of staying informed about and/or controlling for material changes that may occur in the supply chain. One of the following is required:
 - a. Suppliers must be required to communicate any proposed changes to the manufacturing process or to intentional product inputs that may alter the chemical composition of the product, or other aspects relevant to certification (e.g. recycled content), to the certification holder. When there are multiple supply chain tiers, suppliers must communicate this requirement to their own suppliers.
 - b. All suppliers that provided chemical composition data, or other product relevant data (e.g. amount of recycled content), for the prior certification must be contacted again prior to renewal and asked to provide updated data or to confirm that no relevant changes were made by them or their (sub-)suppliers.
4. Management system best practices including:
 - a. A document control process.
 - b. Internal self-audits conducted at regular planned intervals (at least once each

- certification cycle), and
- c. A corrective action process.

3.2 Environmental Policy and Management

3.2.1 Intent

Applicant companies are committed to protecting the environment and are responsibly managing potential environmental impacts.

3.2.2 Requirements Summary

Bronze	Environmental risks are assessed for the final manufacturing stage and for the product.
	An environmental policy based on the environmental risks associated with the final manufacturing stage and the product is in place.
	A strategy is developed for implementing the policy at all final manufacturing stage facilities.
	Company executives demonstrate commitment and support for establishing and maintaining a culture for achieving high levels of environmental performance.
Silver	Environmental performance data are collected and analyzed to measure progress towards achieving the strategy.
	Management systems are in place that support the implementation and oversight of the policy at final manufacturing stage facilities.
Gold	Responsible sourcing management systems are in place that support the implementation and oversight of the environmental policy within the product's supply chain.
Platinum	Environmental objectives are incorporated into relevant employee performance evaluations, and incentives are provided to encourage top management and employees to actively participate in achieving the company's environmental goals.

3.2.3 Assessing Environmental Risks & Opportunities

Intended Outcome(s)

Environmental risks and opportunities relevant to the company and product are examined and understood.

Applicable Achievement Level(s)

Bronze

Requirement(s)

Identify environmental risks and opportunities for all final manufacturing stage facilities and for the certified product.

The risk and opportunity assessment must include:

1. Identification of environmental risks associated with processes occurring at final manufacturing stage facilities, countries in which the final manufacturing stage facilities are located, the product's supply chain, product use, and product end of use. The following issues are de facto high-risk in the noted scenarios:
 - a. Greenhouse gas emissions and contribution to climate change are high-risk issues for:
 - i. Final manufacturing stage facilities with combined total scope 1 & 2 greenhouse gas emissions $\geq 10,000$ metric tons CO₂e/year.
 - ii. Products requiring energy during the use phase (unless the product saves more energy than it uses).
 - b. Air pollution is a high-risk issue for:
 - i. Final manufacturing stage facilities with on-site combustion power plants (including biomass combustion).
 - ii. Final manufacturing stage facilities at which processes commonly known to be air pollutant intense take place. This includes (but is not limited to): Smelting metals, refining oil, producing cement, using high volumes of organic solvents, and incinerating waste.
 - c. Water availability is a high-risk issue for:
 - i. Final manufacturing stage facilities purchasing and/or withdrawing $\geq 100,000$ cubic meters of freshwater per year when located in medium to high stress location(s) (as defined per the Water Stewardship requirements).
 - ii. Products requiring high volumes of water during the use phase.
 - d. Water and/or soil quality (i.e. pollution) are high-risk issues for:

- i. Final manufacturing stage facilities with pollutant intense processes (defined per the Water & Soil Stewardship requirements).
 - ii. Final manufacturing stage facilities for which stormwater discharge is regulated per the corresponding regional regulatory permitting system. In regions where stormwater is not regulated, any facility within the specific categories of industrial activity that must be covered under the U.S. National Pollutant Discharge Elimination System is de facto high-risk for this issue.
 - iii. Products that are primary contributors to microfiber and microplastic pollution (i.e. textile and apparel products made from synthetic fibers that are wet processed and/or that require washing with water during the use phase, tires, and plastic pellets). Note: Several additional product types that are major contributors to plastic pollution are not eligible for certification per Section 2.2. Products Not Eligible.
 - e. Waste generation is a high-risk issue for:
 - i. Final manufacturing stage facilities for which hazardous waste is regulated per the corresponding regional regulatory permitting system. In regions where hazardous waste is not regulated, any facility producing waste that is listed or characterized as hazardous waste as defined by the European Union's Waste Framework Directive and associated List of Waste or the U.S. Environmental Protection Agency is de facto high-risk for this issue.
2. Identification of best practices employed to address the risks.
 3. Information regarding the impact and importance of identified risks.
 4. Prioritization of the risks and opportunities identified.

3.2.4 Environmental Policy

Intended Outcome(s)

The company has formally committed to protecting the environment through company policy approved at the executive level.

Applicable Achievement Level(s)

Bronze

Requirement(s)

For the applicant company OR for all final manufacturing stage companies, commit to protecting the environment through company policy.

The policy or policies must:

1. Establish expectations for final manufacturing stage facilities, the product's supply chain, and other relevant stakeholders.
2. Include the company's commitment to address any high-risk environmental issues identified via the risk assessment, including any de facto high-risk issues. (If no high-risk issues were identified, the policy may address environmental protection in a general way.)
3. Define staff responsibilities for implementation.
4. Be formally approved and signed by a duly empowered officer of the applicant company or by the board of directors.

3.2.5 Strategy for Environmental Policy Implementation

Intended Outcome(s)

Environmental performance data are regularly analyzed to ensure manufacturing processes are not having a negative impact on the environment and to measure progress towards environmental performance goals.

Applicable Achievement Level(s)

Bronze and Silver

Requirement(s)

Bronze level: For the applicant company OR for all final manufacturing stage companies, develop a strategy for implementing the environmental policy at all final manufacturing stage facilities and report on implementation progress at each recertification.

Silver Level: For the applicant company OR for all final manufacturing stage companies, analyze environmental performance data to measure progress towards achieving environmental targets and objectives, and identify areas for improvement.

For the Bronze level, the strategy must:

1. Address priority risks and opportunities (per Section 3.2.2).
2. Include specific time-bound performance and impact objectives to guide decision-making.
3. Define the scope of implementation.
4. Define the company's human, technical, and material resource allocation for implementation.

For the Silver level, environmental performance data must be analyzed every two years. For any identified areas of poor performance, methods of improving outcomes must also be identified and evaluated and the strategy refined accordingly.

3.2.6 Demonstrating Commitment

Intended Outcome(s)

A culture that prioritizes environmental protection is established, promoted, and improved by company leadership.

Applicable Achievement Level(s)

Bronze

Requirement(s)

Demonstrate commitment and support for establishing and maintaining a culture whereby employees and business partners are able to achieve high levels of environmental performance.

The applicant's leadership team (i.e. C-level executive and/or Board of Directors) must demonstrate commitment and support by:

1. Communicating the company's environmental aspirations and strategy for protecting the environment internally and/or externally.
2. Defining a position to actively lead on protecting the environment, oversee implementation of the strategy, and drive continuous improvement efforts.
3. Ensuring there are defined procedures for escalating environmental risks and identified impacts to the executive team.

3.2.7 Environmental Management System

Intended Outcome(s)

An environmental performance management system is in place, ensuring that environmental performance of the applicant company and product is improved over time.

Applicable Achievement Level(s)

Silver and Gold

Requirement(s)

Silver level: For the final manufacturing stage facility, implement a management system that supports achievement of the environmental policy commitments within facility operations.

Gold level: For the applicant company OR for all final manufacturing stage companies, implement a responsible sourcing management system that supports achievement of the environmental policy commitments within the product's supply chain.

For the Silver level, the management system must include the following elements:

1. Designated staff with environmental compliance responsibilities.
2. Designated oversight function and process.
3. Procedures that support implementation of the environmental policy at all final manufacturing stage facilities.
4. Education for staff with environment-related duties on environmental best practices relevant to the facilities.
5. Procedures to measure and evaluate activities against the environmental policy.
6. Policies and procedures for the prompt implementation of corrective and preventive actions.

For the Gold level, the responsible sourcing management system must include the following elements:

1. Designated staff with responsible sourcing responsibilities.
2. Designated oversight function and process.
3. Procedures to communicate to suppliers the company's environmental policy and any associated sourcing business processes.
4. Supplier contractual requirements for environmental policy compliance and monitoring (e.g. supplier codes of conduct). Contracts must require suppliers to extend social compliance expectations to their suppliers.
5. Evaluation of new suppliers prior to the awarding of contracts to determine if the supplier can meet requirements.
6. Policies and procedures for the prompt implementation of corrective and preventive actions.
7. Education for sourcing and/or procurement team(s) on responsible sourcing best practices.
8. Business procedures for identifying and documenting the cause and resolution of environmental issues and/or impacts in the supply chain.

For recertification at the Silver or Gold level, the policy, procedures, practices and/or programs must be reviewed to identify deficiencies and implement changes (if needed) that will lead to improved performance. Remedial activities (if needed) must be underway and seek to identify and address root

causes. (Note: This applies to the company-level management system at the Silver level and also to the responsible sourcing management system at the Gold level.)

3.2.8 Environmental Protection Incentives

Intended Outcome(s)

Company management is motivated to take action to protect the environment as relevant to company operations.

Applicable Achievement Level(s)

Platinum

Requirement(s)

For the applicant company OR for all final manufacturing stage companies, incorporate environmental performance results into relevant employee and executive performance evaluations and incentive structures.

The following are required:

1. Performance assessments of any executives or employees with designated environmental responsibilities must include consideration of or metrics derived from the environmental policy and strategy.
2. Environmental performance results must be considered in compensation packages / incentive plans for top company executives and management with environmental management or oversight functions (i.e., from C-suite executives to business unit and functional heads).

3.3 Measurable Improvement

Intended Outcome(s)

What a product is made of and how it is made is measurably improved until the product achieves at least the Gold level requirements in all five C2C key categories. While the Gold level reflects high achievement, reaching the Platinum level in all categories is the ultimate goal.

Applicable Achievement Level(s)

Silver

Requirement(s)

At recertification, demonstrate that at least one measurable improvement has been made in at least one of the five program categories since the prior certification.

The measurable improvement required is *in addition to* any actions already required in individual program categories (e.g. progress on strategies and optimization plans).

4 // MATERIAL HEALTH REQUIREMENTS

4.1 Category Intent

Chemicals and materials used in the product are selected to prioritize the protection of human health and the environment, generating a positive impact on the quality of materials available for future use and cycling.

4.2 Requirements Summary

To achieve a desired level within the category, the requirements at all lower levels must also be met.

Bronze	Product is in compliance with the Restricted Substances List.
	Product does not contain organohalogen substances of special concern above relevant thresholds.
	Product is 100% characterized by generic material.
	Product is ≥ 75% assessed (complete formulation information collected for 100% of materials released directly into the biosphere).
	Strategy developed to phase-out or optimize all x-assessed or grey-rated chemicals.
Silver	Product is ≥ 95% assessed (complete formulation information collected for 100% of materials released directly into the biosphere).
	Product does not contain materials with > 1% carbon-bonded halogens by weight, or recognized PBTs or vPvBs. Product does not contain EU CLP Cat.1 & 2 CMRs or substances causing an equivalent level of concern, or exposure is unlikely or expected to be negligible.
	Product has low VOC emissions (required for products permanently installed in buildings).
	Product complies with VOC content limits (required for liquid and aerosol consumer and construction products).
Gold	100% of homogeneous materials subject to review are assessed (i.e. none have a grey rating due to insufficient data).

	Product is optimized for material health (i.e., all x-assessed chemicals replaced or phased out).
	Strategy developed to either increase the percentage of preferred (A/a and/or B/b assessed) materials and chemicals in the product or optimize the chemistry in the supply chain.
	Product has very low VOC emissions or is inherently non-emitting (required for products permanently installed in buildings).
Platinum	All product-relevant process chemicals are assessed (i.e. none have a grey rating due to insufficient data) and no x-assessed chemicals are used.
	> 50% of the product by weight is assessed as A/a or B/b.
	≥ 75% of the product's input materials or chemicals have a C2CPII Material Health Certificate at the Gold or Platinum level or ≥ 50% of the product's input materials or chemicals are Cradle to Cradle Certified at the Gold or Platinum level or equivalent. A strategy is developed to increase percentages over time.
	<p>OR</p> <p>Environmental health impact hotspot analysis based on life cycle assessment completed, emissions and resource use hotspots that impact human and environmental health are identified, and material health optimization strategy is developed based on the results.</p>

4.3 Restricted Substance List Compliance

Intended Outcome(s)

In alignment with leading regulations that aim to protect human health and the environment, the use of well-known toxic chemicals in the product is avoided.

Applicable Achievement Level(s)

Bronze

Requirement(s)

Comply with the Restricted Substance List (RSL).

The product and its homogeneous materials comply with relevant restrictions on the Restricted Substances List (see C2CPII *Restricted Substances List* reference document). Note: The RSL is comprised of a core list, which is applicable to all material and product types, as well as additional lists that are applicable to specific material and product types. Unless noted otherwise, the lists indicate the maximum allowable concentration of each restricted substance in any homogeneous material subject to review (as defined in Section 4.5) in a certified product.

For textile chemical formulations, the product also complies with the most recent version of the Zero Discharge of Hazardous Chemicals (ZDHC) Manufacturing Restricted Substance List (MRSL) or equivalent.

4.4 Avoidance of Organohalogens

Intended Outcome(s)

Organohalogens, a class of substances associated with toxicity concerns in multiple use-cycle stages, are progressively avoided, beginning with high organohalogen content materials and other classes of special concern.

Applicable Achievement Level(s)

Bronze, Silver, Gold

Requirement(s)

Bronze level: Use materials that are not and do not contain organohalogen substances of special concern above relevant thresholds (i.e. per- and polyfluoroalkyl substances (PFASs), halogenated flame retardants (HFRs), halogenated polymers, halogenated organic solvents, and other highly halogenated, carbon-based materials). Certain exemptions apply.

Silver level: Use materials in the product that do not contain organohalogen substances in exceedance of 1% by weight. Certain exemptions apply.

Gold level: Use materials in the product that do not contain organohalogen substances above subject to review limits (i.e. 100 ppm or lower if specific concentration limits are defined).

The percentage of organohalogen substances within a homogeneous material is equal to the percentage by weight of all carbon-bonded halogen atoms (Cl, Br, F, and I) within the material.

For the Bronze level, the applicable restrictions for organohalogen substances of special concern are:

1. PFASs: Per- or polyfluoroalkyl substances are defined as fluorinated organic chemicals containing at least one fully fluorinated carbon atom. PFAS-based materials, including fluoropolymers and PFAS-coatings, are not permitted for use (except in exempt materials/parts as noted below). If present as an impurity or minor additive in an otherwise non-fluorinated organic material, carbon-bonded fluorine within PFASs in the material must be less than 1,000 ppm of the homogeneous material by weight.
2. HFRs: Halogenated flame retardants are defined as any chlorinated or brominated substance added to a material for the purpose of increasing heat/fire resistance or decreasing flammability. In addition to the restrictions on specific HFRs on the RSL, carbon-bonded chlorine and bromine within any flame retardant in the material (intentionally added or present as an impurity) must be less than 1,000 ppm of the homogeneous material by weight (except in exempt materials/parts as noted below).
3. Halogenated polymers, halogenated organic solvents, and other highly halogenated, carbon-based materials: Any material containing a sum total of 10% or more of carbon-bonded fluorine, chlorine, and/or bromine by weight is considered a highly halogenated carbon-based material and is thus not permitted for use (except in exempt materials/parts as noted below).

Exemptions

For the Bronze and Silver levels, a homogeneous material may be exempt from meeting this requirement if any of the following conditions are met:

1. It is present at less than 1% of the finished product by weight. Materials that are surface coatings applied to foodservice ware or textiles, including apparel, carpets, and furnishings do not qualify for this exemption.
2. It is contained in a part that is less than 1% of the finished product by weight.
3. The use of a halogenated organic substance in the material is required to meet regulatory requirements (e.g., fire standards). To claim this exemption the following conditions must be met:
 - a. alternative methods of meeting the regulatory requirement must not exist, and
 - b. the applicant must conduct ongoing research into alternative ways of complying with the regulation without the use of the halogenated organic or other x-assessed substance.

Exemptions 1 and 2 may be claimed for homogeneous materials that in sum make up no more than 5% by weight of the finished product. No exemptions may be claimed to meet the Gold level requirement.

4.5 Material and Chemical Inventory

Intended Outcome(s)

An increasing percentage of the product's material and chemical composition is known so that possible risks the materials and chemicals may pose to human health and the environment can be assessed and strategies for using safer chemistry can be developed.

Applicable Achievement Level(s)

Bronze, Silver, Gold, and Platinum

Requirement(s)

Bronze level: Characterize all homogeneous materials in the product by concentration and generic material type or product category/name. In addition, fully define the chemical composition of products that are released directly into the biosphere as part of their intended use (e.g. soaps, paints). For other product types, collect the chemical composition information necessary to assess at least 75% of the product.

Silver level: Fully define the chemical composition of products released directly into the biosphere as part of their intended use (e.g. soaps, paints). For other product types, collect the chemical composition information necessary to assess at least 95% of the product.

Gold level: Fully define the chemical composition of all homogeneous materials within the product.

Platinum level: Fully define the chemical composition of all process chemistry that comes into contact with the product or its material constituents during the final manufacturing stage.

Characterizing Materials in the Product

The concentration of each material as a percentage of the total product weight must be determined.

Fully Defining the Chemical Composition of Materials

Toxicological assessment of a material requires full material disclosure from the supplier(s)/formulator(s) controlling the chemical composition of the material. A homogeneous material is considered fully defined when the chemical names and chemical identifiers are known for all chemicals subject to review. The chemicals subject to review in each homogeneous material are those present at a concentration $\geq 0.01\%$ (100 ppm), with the following exceptions:

1. If a limit below 100 ppm is indicated for a specific substance by the Restricted Substance List, the lower limit applies.

2. If a specific concentration limit (SCL) for any toxicity endpoint of a substance is below 100 ppm as indicated by the Table of Harmonized Entries in Annex VI to the Classification, Labelling, and Packaging of Substances and Mixtures regulation, the lower limit applies.
3. Exemption: A product may contain a maximum of 1% exempt components by weight. The exemption is allowed for minor, commodity type components including sewing thread and solid, preformed fasteners and bearings. Homogeneous materials and substances in these component types may be exempt from review if the following conditions are met:
 - a. Metallic components are in compliance with the Restriction of Hazardous Substance (RoHS) directive.
 - b. Non-metallic components are in compliance with the Restricted Substance List.
4. In any case where the relevant specialized assessment methodology (e.g. Recycled Content Materials Assessment Methodology, Geological Materials Assessment Methodology, Externally Managed Component Assessment Methodology) allows or requires a different method of defining materials, including different methods and/or limits for determining what chemicals are subject to review, the methods indicated by the relevant methodology document(s) take precedence.

Note: For the Bronze and Silver levels, the percentage assessed is calculated using the methodology in Section 4.6.

Fully Defining Process Chemistry

Process chemistry is considered fully defined when the chemical names and chemical identifiers are known for all process chemicals subject to review.

Process chemicals subject to review are those that are used as an intentional part of any of the processes included in the final manufacturing stage, including:

1. Pure chemical substances
2. Chemical substances present in mixtures at a concentration $\geq 0.1\%$ (1000 ppm) prior to any dilution at the manufacturing site(s). The exceptions listed above for materials apply (per #1-4 in the sub-section titled Fully Defining the Chemical Composition of Materials, with the default limit as 1000 ppm instead of 100 ppm). Additionally, for textile processing, the limits indicated by the Zero Discharge of Hazardous Chemical (ZDHC) Manufacturing Restricted Substance List (MRSL) take precedence if lower.

4.6 Assessing Chemicals and Materials

Intended Outcome(s)

To encourage continued improvement of material health, an increasing percentage of the product's chemicals and materials are assessed. By the time a product reaches the Gold level, all materials and

chemicals subject to review within the product have been assessed as compatible with human and environmental health according to the Cradle to Cradle Certified Material Health Assessment Methodology.

Applicable Achievement Level(s)

Bronze, Silver, Gold, and Platinum

Requirement(s)

Bronze level: Assess at least 75% of the product.

Silver level: Assess at least 95% of the product.

Gold level: Assess 100% of the product.

Platinum level: Assess 100% of the product AND all process chemistry that comes into contact with the product or its material constituents during the final manufacturing stage.

Assessing Chemicals and Materials

Homogeneous materials and chemicals subject to review, including process chemistry subject to review at the Platinum level, must be assessed according to the Material Health Assessment Methodology and supporting documents. Based on these methods, chemicals subject to review are assigned a, b, c, x, or grey chemical risk ratings and homogeneous materials are assigned A, B, C, X or GREY ratings.

A chemical substance is considered to be assessed when it has been assigned an a, b, c, or x (abc-x) chemical risk rating.

A homogeneous material is considered to be assessed when it has been assigned an A, B, C, or X (ABC-X) assessment rating or is otherwise considered to be assessed based on the specific, relevant methodology (e.g. recycled content assessment methodology, Externally Managed Component methodology, etc.).

A material or component that is separately certified and used in another product seeking certification may count as assessed at the same Material Health level and percentage assessed at which it was certified. Materials assessed as A, B, or C may only contain chemicals subject to review that have been assigned a, b, or c chemical risk ratings. Materials assessed as X will contain at least one chemical subject to review that has been assigned an x risk rating, and may also contain chemicals with grey ratings indicating insufficient data for assessment.

Determining Percentage Assessed

The percentage of the product that is assessed must be determined as follows:

1. For each homogeneous material in a product the applicant must either:
 - a. Count the entire material as assessed, by weight, if the material has received an A, B, C, or X (ABC-X) assessment rating. Or,
 - b. Count the material as partially assessed based on assessed chemicals subject to review in the material. In this case, the percentage assessed for the material is equal to the lower of:
 - i. the percentage by weight of all abc-x assessed chemicals within the material, and
 - ii. the percentage by number of all abc-x assessed chemicals within the material.
2. For products consisting of a single homogeneous material, the percentage assessed must be calculated as per 1b above (1a is not allowed).
3. For products composed of two or more homogeneous materials, the percentage assessed is calculated as the weighted average of the percentages assessed for each homogeneous material subject to review in the product.

4.7 Material Health Optimization Strategy

Intended Outcome(s)

A strategy is in place for prioritizing the use of materials and chemicals known to be compatible with human and environmental health. Demonstrable progress is made towards achieving the strategy.

Applicable Achievement Level(s)

Bronze, Silver, Gold, and Platinum

Requirement(s)

Develop a Material Health optimization strategy and demonstrate progress towards achieving the strategy at each recertification.

For the Bronze and Silver levels, the strategy must include a plan for assessing and optimizing or eliminating all X/x assessed and GREY/grey materials and chemicals subject to review. One or more material(s) or chemical(s) must be targeted for specific optimization actions in the near-term (defined as 0-2 years). Optimization work relevant to at least one material or chemical must have been completed during the two-year period between certification and recertification.

For the Gold and Platinum levels, the strategy must focus on:

1. Increasing the percentage of A/a and/or B/b assessed materials and chemicals in the product, or
2. Optimizing chemistry in the supply chain per Section 4.11.

4.8 Using Optimized Materials

Intended Outcome(s)

The product is made from chemicals and materials that have been intentionally selected based on their preferred safety attributes.

- At the Silver level, the product does not contain chemicals classified or listed as carcinogenic, mutagenic, or reproductive toxicants (CMRs), or, if these substances are present, exposure to them is unlikely or expected to be negligible. In addition, the product does not contain persistent, bioaccumulative, and toxic (PBTs) or very persistent and very bioaccumulative (vPvBs) substances. The product also does not contain substances that cause an equivalent level of concern or exposure to them is unlikely or expected to be negligible.
- At the Gold level, chemicals and materials intentionally added to the product are assessed as compatible with human and environmental health according to the Cradle to Cradle Certified Material Health Assessment Methodology. Exposure to hazardous chemicals during final manufacture, use, and end-of-use of the product is unlikely or expected to be negligible.
- At the Platinum level, an increased percentage of the product is made from chemicals and materials that are assessed as preferable for human and environmental health according to the Cradle to Cradle Certified Material Health Assessment Methodology. Intentionally used process chemicals that contact the product during manufacture are assessed as compatible with human and environmental health according to the Cradle to Cradle Certified Material Health Assessment Methodology.

Applicable Achievement Level(s)

Silver, Gold, and Platinum

Requirement(s)

Silver level: Use materials in the product that do not contain substances that are:

- Classified or listed as known or suspected to cause cancer, birth defects, genetic damage, reproductive harm (CMRs), or cause an equivalent level of concern, unless exposure to these substances during the product's final manufacturing, use, and end-of-use is unlikely or expected to be negligible, or

- Listed as persistent, bioaccumulative, and toxic (PBTs) or very persistent and very bioaccumulative (vPvBs).

Gold level: Use materials that are assessed as compatible with human and environmental health according to the Cradle to Cradle Certified Material Health Assessment Methodology, including only A/a, B/b, and C/c assessed materials and chemicals in the product.

Platinum level: Use materials and process chemicals that are assessed as preferable for human and environmental health according to the Cradle to Cradle Certified Material Health Assessment Methodology, including > 50% A/a and B/b assessed materials and chemicals in the product (see 'Determining Percentage Assessed' in Section 4.6), and only A/a, B/b, and C/c assessed process chemistry.

For the Silver level, CMRs are defined as substances that have received a harmonized classification of Category 1 or 2 in one or more of the CMR endpoints as listed within the EU's Classification, Labelling, and Packaging regulation (CLP) Annex VI, or are CMR substances listed on the REACH Candidate list of Substances of Very High Concern (SVHC) for Authorisation (including those on Annex XIV). PBTs, vPvBs, and substances causing an equivalent level of concern are defined per the REACH Candidate list of Substances of Very High Concern (SVHC) for Authorisation (including those on Annex XIV).

Determining Percentage A/a and B/b-assessed for Platinum level

The percentage of the product that is assessed must be determined as follows:

1. For each homogeneous material in a product the applicant must either:
 - a. Count the entire material as assessed, by weight, if the material has received an A or B assessment rating. Or,
 - b. Count the material as partially assessed based on assessed chemicals subject to review in the material. In this case, the percentage assessed for the material is equal to the lower of:
 - i. the percentage by weight of all a or b assessed chemicals within the product, and
 - ii. the percentage by number of all a or b assessed chemicals within the product.
2. For products consisting of a single homogeneous material, the percentage A/a- and B/b-assessed must be calculated as per 1b above (1a is not allowed).
3. For products composed of two or more homogeneous materials, the percentage A/a and B/b assessed is calculated as the weighted average of the percentages assessed for each homogeneous material subject to review in the product.

4.9 Volatile Organic Compound (VOC) Emissions

Intended Outcome(s)

Indoor air quality is protected.

Applicable Achievement Level(s)

Silver and Gold

Requirement(s)

Silver level: Products designed for permanent indoor use comply with leading standards that demonstrate low VOC emissions.

Gold level: Products designed for permanent indoor use comply with leading standards that demonstrate very low to no VOC emissions.

Products designed for permanent indoor use are products that are installed or placed into a building and remain there (i.e. this includes furniture, but not cleaning products).

To demonstrate fulfilment of this requirement, an applicant must show compliance of the product with the requirements of at least one regional set of best practices for qualifying low VOC emission products. Best practices are defined by the current versions of the leading green building certification systems or standards in a given region (such as BREEAM, DGNB, or LEED). See the C2CPII *Volatile Organic Compound Emissions Testing* reference document for a list of recognized standards for the Silver and Gold levels.

Test Report & Laboratory Accreditation Requirements

For the Silver and Gold, levels, the following conditions must also be met:

1. Test report or certificate must refer to a test completed/performed no more than two years prior to the date of application, and
2. The analytical laboratory conducting the test must be ISO/IEC 17025 accredited and the accreditation scope must include the applied test method, either explicitly or implicitly within the scope of a flexible ISO/IEC 17025 accreditation for VOC product emission testing.

Exemption

The following product types are exempt from VOC emissions testing and may be assumed to have low to no VOC emissions:

1. Inherently non-emitting sources per the LEED v4 Building Design & Construction EQ Credit Low-Emitting Materials (stone, ceramics, powder-coated metals, plated metals or anodized metals, glass, concrete, clay brick, and unfinished/untreated solid wood) if they do not include integral organic-based surface coatings, binders, or sealants, and
2. Plaster and stucco that have < 1% organic additives.

4.10 Volatile Organic Compound (VOC) Content

Intended Outcome(s)

Outdoor air quality and the health of product installers and users are protected.

Applicable Achievement Level(s)

Silver

Requirement(s)

For liquid, viscous, or aerosol consumer or construction products, limit volatile organic compound (VOC) content to low levels as established by leading standards.

To demonstrate fulfillment of this requirement, an applicant must show compliance of the product with the requirements of at least one regional set of best practices for qualifying low VOC content products. Best practices are defined by the current versions of the leading green building certification systems or standards in a given region (such as BREEAM, DGNB, or LEED). See the C2CPII *Volatile Organic Compound Content Testing* reference document for a list of recognized standards and test methods.

The following conditions must also be met:

1. Test reports or certificate must refer to a test performed within two years prior to the date of application, and
2. The analytical laboratory conducting the test must be ISO/IEC 17025 accredited and the accreditation scope must include the applied test method, either explicitly or implicitly within the scope of a flexible ISO/IEC 17025 accreditation for VOC product emission testing.

Exemption

Water-based consumer products are exempt from this requirement if the only organic substances with vapor pressure ≥ 0.1 mm Hg at 20°C that are subject to review are ethanol, isopropanol, or fragrances.

4.11 Optimizing Chemistry in the Supply Chain

Intended Outcome(s)

The use and emissions of hazardous chemicals in the product's supply chain are reduced or eliminated over time.

Applicable Achievement Level(s)

Platinum

Requirement(s)

Develop a strategy to reduce hazardous chemical use and or emissions in the supply chain and demonstrate progress towards achieving reductions at each recertification.

Hazardous chemicals in the product supply chain must be addressed by meeting one of the following:

1. 75% or more of the product's input materials or chemicals have a C2CPH Material Health Certificate OR 50% or more are Cradle to Cradle Certified at the Gold or Platinum level or equivalent (percentage is calculated following the approach described for 'Determining Percentage Assessed' in section 4.6 but summing certified materials and/or chemicals rather than assessed materials and/or chemicals).
2. A cradle to cradle human and environmental health impact hot spot analysis has been performed based on life cycle assessment per ISO 14040, and each of the hot spots identified through this analysis are addressed by the strategy to reduce hazardous chemical use and/or emissions in the supply chain of the product. The life cycle assessment must be verified by a qualified third party.

Depending on how hazardous chemicals in the product supply chain are addressed the strategy must include one of the following:

1. Steps to increase the percentage of the product's input materials or chemicals that have a C2CPH Material Health Certificate or are Cradle to Cradle Certified at the Gold or Platinum level (or equivalent) over time and also specifically to increase the percentage of inputs that are certified at the Platinum level.
2. Steps to positively impact (i.e. eliminate or reduce use or emissions of hazardous chemicals) for each of the supply chain hotspots identified through the life cycle assessment.

5 // PRODUCT CIRCULARITY REQUIREMENTS

5.1 Category Intent

Products are intentionally designed for their next use and are actively cycled in their intended cycling pathway(s).

5.2 Requirements Summary

To achieve a desired level within the category, the requirements at all lower levels must also be met.

Bronze	Applicant is involved in a circularity education initiative to gain an understanding of relevant cycling infrastructure development.
	Intended cycling pathway(s) for the product and its materials are defined.
	A plan has been created to address challenges with the cycling infrastructure at the end of the product's first use; potential cycling partners have been identified.
	Select product and material types contain cycled and/or renewable content. Alternative: Limitations that prevent the applicant from meeting this requirement are publicly reported.
	≥ 50% of materials by weight are compatible with the intended cycling pathway(s) (i.e. recyclable, compostable, or biodegradable).
	Circularity data and cycling instructions are publicly available.
Silver	Partnerships for cycling (recovery and processing) of the product have been initiated. If the product is intended for cycling via municipal systems, materials are compatible with those systems.
	Percentage of cycled and/or renewable content, by weight, is equal to or higher than industry averages. Alternative: Limitations that prevent the applicant from meeting this requirement are publicly reported.
	≥ 70% of materials by weight are compatible with the intended cycling pathway(s) (i.e. recyclable, compostable, or biodegradable).

	<p>A strategy for improving product circularity is developed including plans for:</p> <ul style="list-style-type: none"> ○ Increasing the amount of post-consumer recycled content and/or responsibly sourced renewable material, as relevant to the product type, ○ Implementing a circular opportunity or innovation, and ○ Improving the product's design for disassembly (if relevant).
Gold	<p>Percentage of cycled and/or renewable content, by weight, is consistent with values achieved by industry leaders for the product type. Alternative: Limitations that prevent the applicant from meeting this requirement are publicly reported.</p>
	<p>≥ 90% of materials by weight are compatible with the intended cycling pathway(s) (i.e. recyclable, compostable, or biodegradable) and support high-value cycling. This means that the materials are of high quality and are likely to retain their value for subsequent use.</p>
	<p>The strategy has been implemented including:</p> <ul style="list-style-type: none"> ○ Increased use of post-consumer and/or responsibly sourced renewable material as relevant to the product type. Alternative: Limitations that prevent increased use are publicly reported. ○ A circular opportunity or innovation that increases product circularity, ○ Product is designed for easy disassembly (if relevant).
	<p>The product is actively cycled (recovered and processed) and/or a program is implemented to increase the cycling rate or quality of the product's materials after use. (Both are required for short use-phase products; one is required for long use-phase products.)</p>
Platinum	<p>At least two intended cycling pathways are defined for the product and its materials.</p>
	<p>Percentage of cycled and/or renewable content, by weight, has reached the technically feasible maximum.</p>
	<p>≥ 99% of materials by weight are compatible with the intended cycling pathway(s) (i.e. recyclable, compostable, or biodegradable).</p>
	<p>The product is actively cycled in an amount consistent with the product's use-phase (the shorter the use phase, the higher the amount) and a program is implemented to increase the cycling rate or quality of the product's materials after use.</p>
	<p>Cycling rates and quality are monitored over time, and an increase in cumulative cycling rate or quality is demonstrated.</p>

5.3 Circularity Education

Intended Outcome(s)

The applicant has an increased scope of knowledge regarding the circularity potential of their product and has identified opportunities and solutions for overcoming barriers to actively cycling their product via biological and/or technical pathways.

Applicable Achievement Level(s)

Bronze

Requirement(s)

Participate in a circularity education initiative to obtain practical knowledge about developing or improving upon the infrastructure needed for the product to be part of a circular system.

The circularity education initiative must be led by:

1. A company or organization other than the applicant company, and focused on developing the circular economy, or
2. The applicant company, and be a collaborative platform that involves other companies or organizations.

The initiative must:

1. Support learnings toward implementing the company's circularity strategies and cycling infrastructure.
2. Aim to drive progress within an industry or across multiple industries.
3. Ensure that the initiative allows for adequate voice for all participants.

The applicant must be actively participating in the initiative during the certification period.

5.4 Defining the Product's Technical and/or Biological Cycles

Intended Outcome(s)

The applicant has designated all homogeneous materials in the product as either biological or technical and has identified appropriate cycling pathways for those materials once the product has reached the end of its current use cycle.

Applicable Achievement Level(s)

Bronze and Platinum

Requirement(s)

Bronze level: Designate all homogeneous materials in the product as being intended for technical and/or biological cycles and define the intended cycling pathway(s) for each material. For materials designated for technical cycles, recycling must be one intended cycling pathway.

Platinum level: Define at least two intended cycling pathway(s) for each homogeneous material in the product.

The following homogeneous materials must be designated for the biological cycle:

1. Materials designed to be released directly to the biosphere as part of their intended use or end-of-use (e.g. liquid cleaning products, soaps, perfume, toilet paper),
2. Biological or biologically-derived materials that are commonly composted (e.g. paper), and
3. Coatings, finishes, or liquids applied to materials intended for biological cycles.

For intermediate and wet-applied products, the Bronze level requirements must be applied in the context of at least one relevant finished product or applied substrate example application, respectively.

Exemption

Intermediate and wet-applied products are exempt from the Platinum level requirement.

5.5 Preparing for Active Cycling

Intended Outcome(s)

The applicant has taken demonstrable steps towards addressing any barriers to material recovery and processing in order to actively cycle () those materials for their next use.

Applicable Achievement Level(s)

Bronze and Silver

Requirement(s)

Bronze level: Develop a cycling plan to address challenge(s) inhibiting development of the cycling infrastructure for the product at the end of its first use, and identify potential partners that are

capable of recovering and processing the product. Report on progress made towards achieving the plan at recertification.

Silver level: Initiate partnerships for recovery and processing of the product according to its intended cycling pathway(s). If the product is intended for cycling via municipal systems, use materials that are compatible with those systems.

For the Bronze level, the cycling plan must include the following:

1. Discrete planned actions and an associated timeline.
2. Identification of potential partners or internal resources for product recovery and processing in accordance with the intended cycling pathway(s) in countries and/or states that cumulatively cover a region accounting for 60% or more of product sales (with one exception per #3 below). Products intended to be cycled via municipal systems or addressed by regional/national product stewardship laws are exempt from this requirement.
3. For intermediate and wet-applied products, the plan must address challenges inhibiting development of the cycling infrastructure for at least one finished product or applied substrate example application, respectively. Identification of potential partners is not required for these product types.
4. For products containing electronic components, the plan must address the recovery and recycling of intentionally used trace elements whose extraction is associated with risks of limited supply (i.e. 'scarce elements').

At recertification, progress must be demonstrated on any planned actions.

For the Silver level, one or more of the following is required in countries and/or states that cumulatively cover a region accounting for 60% or more of product end sales:

1. The applicant or retail partner has initiated partnership(s) or dedicated internal resources for product recovery and processing. (Initiation of a partnership is defined as the applicant having an active agreement or contract(s) with entities involved in the recovery and processing of the product for another use cycle.)
2. A product stewardship law or program for the particular product type is in place (e.g. California Carpet Stewardship Law),
3. If intended for cycling via municipal systems, materials are a type that is commonly recycled or composted via curbside pick-up and the material is accepted by municipal recycling programs in the region(s) where the product is sold.

Exemptions

Products with a use-phase greater than one year that have been on the market for less than their average use-phase are exempt from the Silver level requirement at initial certification.

Intermediate products and liquid formulations are exempt from Silver level requirements in all cases.

5.6 Increasing Demand: Incorporating Cycled and/or Renewable Content

Intended Outcome(s)

Demand for circularly-sourced materials is increased as a result of the increased use of cycled or renewable materials in the product, helping to close the loop and advance the circular economy. Negative impacts of virgin material use are also minimized.

Applicable Achievement Level(s)

Bronze, Silver, Gold, and Platinum

Requirement(s)

Bronze Level: For select commonly cycled product and material types, incorporate a minimum percentage of cycled and/or renewable content into the product. Alternatively, publicly disclose an explanation of the limitation(s) preventing achievement of the required minimums.

Silver Level: Incorporate a percentage of cycled and/or renewable content into the product equal to or greater than industry averages. Develop a plan for increasing the use of post-consumer recycled and/or responsibly sourced renewable content, and demonstrate progress towards achieving the plan at recertification. Alternatively, publicly disclose an explanation of the limitation(s) preventing achievement of the required percentage(s).

Gold Level: Incorporate a percentage of cycled and/or renewable content into the product that is consistent with industry leaders for the product type. Depending on material type, incorporate either post-consumer recycled or responsibly sourced renewable content. Alternatively, publicly disclose an explanation of the limitation(s) preventing achievement of the required percentage(s).

Platinum Level: Incorporate the maximal technically feasible percentage of cycled and/or renewable content into the product.

For the Bronze through Platinum certification levels, the required minimum percentages of cycled and/or renewable content are listed by homogeneous material and application type in the C2CPII

Required Percentages of Cycled and Renewable Content by Product and Material Type reference document. In general, the percentages increase with achievement level, but for products and materials where it is challenging to use cycled materials, the percentage may be zero at one or more levels. The required percentages must be met at the homogeneous material level or the product level as noted below and in the 'Instructions for Use' tab in the C2CPH *Required Percentages of Cycled and Renewable Content by Product and Material Type* reference document.

The following are required for multi-material products (i.e. products containing more than one homogeneous material), with one exception as noted below:

1. For the Bronze and Silver levels, at least 90% of the homogeneous materials by weight must meet the required minimum percentages of cycled or renewable content.
2. For the Gold and Platinum levels, at least 95% of the homogeneous materials by weight must meet the required minimum percentages of cycled or renewable content.

Exception: For multi-material products where there is only one percentage listed per achievement level, the percentages provided are product-level percentages that may be met in a variety of ways as long as the finished product overall achieves the required percentage of cycled or renewable content by weight. In these cases, there are no minimum percentages required for individual materials in the product.

For the Bronze, Silver, Gold, and Platinum levels,

1. For cycled content to count towards the required percentages, the amount of cycled content must be verified based on chain of custody documentation (with the exception of steel and aluminum material that can be traced via specification).
2. For biologically-derived plastics and liquid formulations to count as renewable, the amount of bio-based content must be determined based on:
 - a. Established standards that quantify bio-based content using radiocarbon dating, or
 - b. Chain of custody documentation.
3. For biological and biologically-derived materials associated with extensive evidence of ecosystem destruction due to land conversion and/or poor management practices (e.g. palm oil, wood, peat) to count as renewable, the material must be certified to a C2CPH-recognized responsible sourcing standard, or an alternative equivalent to certification must be in place, that requires:
 - a. Compliance with all applicable laws and regulations of the country in which farming or harvesting operations occur.
 - b. Operations that respect land rights and land use rights, and are unlikely to cause displacement of food production.
 - c. Planning, monitoring, management, and continuous impact assessment for the farming and/or harvesting of material.

- d. Maintenance, conservation, or enhancement of biodiversity in the forest/vegetation or other ecosystem.
 - e. Maintenance or enhancement of the productive function of the forest/vegetation or other ecosystem area and efficient use of harvested materials (e.g. rate of harvest does not exceed rate of re-growth in the long-term).
 - f. Maintenance or enhancement of the health and vitality of the forest/vegetation or other ecosystem and its protective systems (soil and water).
4. For commonly recycled biological and biologically-derived materials, renewable content counts half as much as recycled content towards meeting the required recycled content percentages (e.g. if the percentage of recycled content required is 30%, then 60% renewable content OR 30% recycled content is required). This requirement does not apply to biological fibers used in apparel (i.e. for biological fibers used in apparel, renewable content counts in the same way as recycled content towards meeting the required percentages).

For the Gold and Platinum levels:

- 1. For any type of biological material to count as renewable, the material must be certified to a C2CPH-recognized responsible sourcing standard, or an alternative equivalent to certification must be in place (see the Bronze level within this section for required responsible sourcing program elements).
- 2. For recycled content to count towards the required percentages, at least some of the recycled content must be post-consumer (with specific percentages required for certain material and product types per the C2CPH *Required Percentages of Cycled and Renewable Content by Product and Material Type* reference document).

Alternative to Meeting Required Percentages of Cycled and/or Renewable Content: Feasibility Analysis

For the Bronze, Silver and Gold levels: A Feasibility Analysis may be applied as an alternative to meeting required percentages of cycled and/or renewable content in any case where an applicant is unable to meet the required percentages, including post-consumer recycled and responsibly sourced content as relevant. This alternative may be used for one or more materials in a product and at any achievement level.

The following are required:

- 1. An explanation of the limitation(s) preventing the incorporation of the target amount of cycled or renewable content (including post-consumer or responsibly sourced as relevant) and how, based on these limitation(s), the amount of cycled or renewable content currently used represents the maximum that is currently feasible.
- 2. The explanation must be reported publicly.

3. A strategy for addressing the identified limitation(s) and increasing the amount of cycled and/or renewable content (including post-consumer or responsibly sourced as relevant) over time must be developed. The strategy must include discrete objectives and an associated timeline.
4. For recertification:
 - a. The applicant must demonstrate progress towards achieving the objectives.
 - b. A description of progress made must be reported publicly

5.7 Material Compatibility for Technical and/or Biological Cycles

Intended Outcome(s)

Product materials with the highest capacity for biological and/or technical cycling have been intentionally selected, increasing the likelihood that such materials will retain their value and move through subsequent cycles of use.

Applicable Achievement Level(s)

Bronze, Silver, Gold, and Platinum

Requirements

[for web summary page]

Bronze level: For 50% of the product by weight, incorporate materials that are compatible with the intended cycling pathway(s).

Silver level: For 70% of the product by weight, incorporate materials that are compatible with the intended cycling pathway(s).

Gold level: For 90% of the product by weight, incorporate materials that are compatible with the intended cycling pathway(s) and have high-value technical or biological cycling potential.

Platinum level: For 99% of the product by weight, incorporate materials that are compatible with the intended cycling pathway(s).

For a material to count towards the percentage of materials compatible with the intended cycling pathway(s) the following conditions must be met:

1. Homogeneous materials that need to be separated in order to be cycled must be separable by the entity implementing the intended cycling pathway with given instructions and no additional special knowledge.

2. For products that are installed prior to use (e.g. in a building, a vehicle, or fixed within a sidewalk), it must be possible to extract the product from the installed location.
3. For products and materials intended for technical municipal cycling (i.e. municipal recycling), the product and/or material must be compatible for municipal cycling systems (e.g. painted plastics and plastic laminated paper are not currently compatible for municipal recycling).
4. For solid materials intended for the biological cycle, one of the following conditions must be met:
 - a. The material must biodegrade in the intended cycling pathway(s) within the time period and to the extent specified by a C2CPH-recognized compostability standard test.
 - b. For paper and biological materials with $\geq 99\%$ unmodified organic material:
 - i. The material, at its maximum thickness and/or density, must disintegrate in the intended cycling pathway(s) within the time period and to the extent specified by a C2CPH-recognized compostability standard test, and
 - ii. A soil sample that is exposed to the material, after disintegration tests have been performed, must pass an ecotoxicity test demonstrating that the exposed soil sample is conducive to plant growth (OECD 208 or equivalent).
 - c. For plastic materials, biologically-derived materials, and biological materials with $< 99\%$ unmodified organic material (including paper that is $< 99\%$ cellulose), all of the following conditions must be met:
 - i. The material must biodegrade in the intended cycling pathway(s) within the time period and to the extent specified by a C2CPH-recognized compostability standard test.
 - ii. For any individual organic additives (e.g. pigments, inks, colorants, scents, secondary polymers, glues) present at a concentration of $\geq 1\%$, the additive must biodegrade in the intended cycling pathway(s) within a specific time period and to the extent specified by:
 1. A C2CPH-recognized biodegradability standard test, or
 2. The available scientific literature and/or research studies.
 - iii. The material, at its maximum thickness and/or density, must disintegrate in the intended cycling pathway(s) within the time period and to the extent specified by a C2CPH-recognized compostability standard test, and
 - iv. A soil sample that is exposed to the material, after disintegration tests have been performed, must pass an ecotoxicity test demonstrating that the exposed soil sample is conducive to plant growth (OECD 208 or equivalent).
5. For materials with unavoidable release to the environment during product use (tires, shoe soles, brake pads, etc.), the fraction of material that on average is likely to be released to the environment from the total product over its lifetime may not be counted as compatible with the intended cycling pathway, unless it is biodegradable in the likely environment where release occurs.

6. For wet-applied products that are intended to be applied to materials with likely biological cycling pathways, one of the following conditions must be met:
 - a. The wet-applied product must not typically comprise >1% by weight of the material(s) to which it is likely to be applied and the wet-applied product in combination with the one likely base material must meet the requirements for solid materials intended for biological cycling (per #4b), OR
 - b. The wet-applied product in combination with one likely base material must meet the requirements for solid materials intended for biological cycling (per #4c).
7. For wet-applied products that are intended to be applied to materials with likely technical cycling pathways, one of the following conditions must be met:
 - a. If the wet-applied material is an ink for printed products, it must pass the qualifications for de-inkability stated in INGEDE Method 11.
 - b. If the wet-applied material is an adhesive for printed products, it must pass the qualifications for adhesive separation stated in INGEDE Method 12.
 - c. Evidence must be provided that the wet-applied material will not adversely affect the reprocessing value of the material to which it has been applied.
8. For products that are liquid formulations (excluding wet-applied products), individual substances within the formulation or the formulation as a whole may be evaluated when determining the percentage compatible for the biological cycle.
 - a. When evaluating based on individual substance(s), the following conditions apply:
 - i. For organic chemicals and surfactants to count towards the percentage compatible, the substance must biodegrade in the intended cycling pathway(s) within the time period and extent specified by a C2CPH-recognized biodegradability standard test. In addition,
 1. Organic chemicals with a $\log K_{oc} < 4.5$ must meet the OECD definition for ultimate biodegradability (aerobic), and
 2. Organic chemicals with a $\log K_{oc} \geq 1.5$ must meet the OECD definition of anaerobic biodegradability.
 - ii. For inorganic chemicals, benign minerals may be counted towards the percentage compatible.
 - iii. Water weight is excluded from the calculation.
 - b. When evaluating the formulation as a whole, if one of the following requirements have been met the product counts as 100% compatible for the biological cycle:
 - i. The formulation has demonstrated ready biodegradability in both anaerobic and aerobic conditions as demonstrated by a C2CPH-recognized biodegradability standard test. (The formulation may also contain benign mineral nutrients.)

- ii. For consumable consumer products (e.g. shampoo, detergents), the material must biodegrade in the intended cycling pathway(s) within the time period and to the extent specified by a C2CPH-recognized biodegradability standard test.

For the Gold level: The use of materials with high-value cycling potential (i.e. high-quality material as defined in #1-2 below) is required.

1. For a material to count towards the required percentage (90%) of materials compatible with the intended cycling pathway(s), the following conditions must be met:
 - a. Materials intended for technical cycles and solid biological materials:
 - i. Must not contain additives or features that are likely to result in low-value (i.e. low-quality) reprocessed material, and
 - ii. Must be able to substitute for virgin material without loss of essential product function or material durability, or have at least two plausible next uses.
 - b. Solid biological materials in products designed for biological cycles must be certified by a C2CPH-recognized compostability program.
2. Select liquid formulations (e.g. soaps, cleaning products, and lubricants) must meet minimum percent ready biodegradability and/or anaerobic biodegradability requirements per C2CPH-recognized standards; testing may be required. (Note: >90% is required in some cases per the recognized standards.)

Analytical laboratories conducting required tests must be accredited or certified for the specific analysis per ISO 17025, DIN CERTCO approved, or equivalent.

5.8 Circularity Data and Cycling Instructions

Intended Outcome(s)

Circularity information for proper end-of-use handling of the product is publicly available, increasing the likelihood that the product's materials will be actively recovered and processed for a next cycle of use.

Applicable Achievement Level(s)

Bronze

Requirement(s)

Make data to support cycling of the product in its intended pathway(s) and instructions for how to cycle the product publicly available.

The applicant must make data to support cycling of the product in its intended pathway(s) publicly available. The data may be reported via the C2CPH Circular Data Report (see C2CPH *Circularity Data Report* reference document) or a C2CPH-recognized circularity reporting standard.

When applicable, the applicant must make instructions for how to cycle the product publicly available. The instructions must include how to identify the materials for cycling, any required product maintenance, and how to recover, reprocess, or recycle the product (see Cycling Instructions section in the C2CPH *Circularity Data Report* reference document).

5.9 Circular Design Opportunities & Innovation

Intended Outcome(s)

The product is designed in a way that creates more end-of-use cycling opportunities.

Applicable Achievement Level(s)

Silver and Gold

Requirement(s)

Silver level: Develop a plan for implementing a circular design opportunity or innovation that increases product circularity; demonstrate progress towards achieving the plan at recertification.

Gold level: Implement a circular design opportunity or innovation.

For the Gold level, circular design opportunities and innovations receiving credit are those that are commonly known and/or can be demonstrated to contribute to one or more of the following:

1. Increased end-of-use cycling
2. Greater engagement with users for end-of-use cycling
3. Prolonged use of the product
4. Decreased need to extract and produce virgin materials

For intermediate and wet-applied products, the applicant must communicate how to implement the circular design opportunity to finished product manufacturer(s) or the customers of the wet-applied material, respectively.

5.10 Product Designed for Disassembly

Intended Outcome(s)

The product may be easily disassembled into discrete materials compatible for its intended cycling pathway(s) making it more likely that a large percentage of the materials in the product will be cycled.

Applicable Achievement Level(s)

Silver and Gold

Requirement(s)

Silver level: For products with multiple materials requiring separation for cycling in the intended pathway, develop a plan for increasing the ease of product disassembly into discrete materials for intended cycling pathway(s).

Gold level: For products with multiple materials requiring separation for cycling in the intended pathway, intentionally design the product for ease of disassembly.

For the Silver level, the plan for increasing the ease of product disassembly must include at least one of the design or communication elements required at the Gold level.

For the Gold level, the following design and communications elements are required as applicable and define “ease of disassembly”:

1. The product includes at least one design feature that improves the ease of disassembly compared to a commonly or previously used alternative product.
2. Processes that result in the loss of specific materials in the product in order to recover other materials (i.e. burning plastics to recover metals) must be avoided.
3. If disassembly operations are conducted by an entity other than the applicant company, comprehensive disassembly instructions must be publicly available and accessible to the party(ies) involved in disassembly.
4. If disassembly operations are conducted by the general public, components must be separable using common tools (e.g. hammer, screwdriver, pliers) with minimal technical experience and instruction.
5. For products with ≥ 30 homogeneous materials and/or if disassembly is performed by an entity other than the product user, the disassembly process:
 - a. Must be at least semi-automated (e.g. for electronics), or

- b. Can occur in a reliably consistent manner with clear instructions (e.g. via a Standard Operating Procedure, or another standardized process for training those who are disassembling the product).

Exemption

Liquid products, intermediate products, and products that do not require separation for the intended cycling pathway, including multi-material products that are cycled either intact or into a new hybrid material are exempt from the requirements in this section.

5.11 Active Cycling

Intended Outcome(s)

The product's materials are actively being recovered and processed for their next use via the intended cycles and/or the product manufacturer is demonstrably invested in a program that will lead to higher product and material cycling rates and/or a higher quality of materials available for cycling.

Applicable Achievement Level(s)

Gold and Platinum

Requirement(s)

Gold level:

For short use-phase products, actively cycle at least some (> 0%) of the product's materials and implement a program to increase the cycling rate or quality of the product for its next use.

For long use-phase products, actively cycle at least some (> 0%) of the product's materials or implement a program to increase the cycling rate or quality of the product for its next use.

Platinum level:

For long use-phase products, actively cycle the product's materials and implement a program to increase the cycling rate or quality of the product for its next use.

Monitor cycling rates and quality over time, and demonstrate an increase in either cumulative cycling rate or quality.

Actively cycle a minimum percentage of the product's materials based on the duration of the product's use-phase.

Active cycling includes both recovery and processing of the product's materials for their next use.

Requirements for a material or product to be considered high quality or have high value cycling potential are provided in Section 5.7 for the Gold level.

For the Platinum level:

1. If demonstrating an increase in cumulative cycling rate, the increase must be via one or more intended cycling pathway(s).
2. The minimum required percentage of actively cycled product is a function of the product's use-phase duration or the average use-phase duration for the product type (the shorter the use phase, the higher the minimum percentage required). This minimum required percentage is calculated as follows:

$\frac{100}{2 + L}$, where L is the product use-phase time (in years) or the average use-phase time for the product type (in years). If using the use-phase time for the product, lifetime warranties may not be used for its derivation.

Exemptions

Long use-phase products that have been on the market for a time period less than the product's average use phase are exempt from the Platinum level requirement.

Intermediate products and liquid formulations are exempt from all requirements in this section.

6 // CLEAN AIR AND CLIMATE PROTECTION REQUIREMENTS

6.1 Category Intent

Product manufacturing results in a positive impact on air quality, the renewable energy supply, and the balance of climate changing greenhouse gases.

6.2 Requirements Summary

To achieve a desired level within the category, the requirements at all lower levels must also be met.

Bronze	Final manufacturing facilities comply with air emissions regulations or guidelines - i.e. permits, international guidelines, or industry best practice.
	Annual electricity use and/or greenhouse gas emissions associated with the final manufacturing stage of the product have been quantified.
	A strategy for increasing use and/or procurement of renewable electricity and addressing greenhouse gas emissions has been developed. The strategy includes near and mid-term targets.
	5% of electricity is renewably sourced or 5% of the resulting greenhouse gas emissions are offset. In addition, 5% of the greenhouse gas emissions from all other sources are offset. Applicable to final manufacturing stage only.
	Alternatives: The 5% renewable electricity and offset targets may be reduced by up to five percentage points (100% of the target) based on verified performance improvement. Financial support of a climate-relevant public policy initiative receives credit as an alternative to meeting the renewable electricity target. The use of eligible bioenergy also receives credit towards reducing the targets.
	Products that use energy during the use phase (e.g. appliances) or that greatly impact the energy efficiency of buildings (e.g. windows, insulation), are certified using a C2CPH-recognized energy efficiency standard or similar, if available.
	Greenhouse gas emissions data for the applicant company, for all final manufacturing stage facilities, or for the final manufacturing stage of the product are made available to stakeholders.

Silver	The embodied emissions associated with the product from cradle to gate, or scope 1-3 emissions for the applicant company, have been quantified.
	The renewable electricity and greenhouse gas reduction strategy includes long-term target(s) in addition to the near and mid-term targets.
	20% of electricity is renewably sourced or 20% of the resulting greenhouse gas emissions are offset. In addition, 20% of greenhouse gas emissions from all other sources are offset. Applicable to final manufacturing stage only.
	Alternatives: The 20% renewable electricity and offset targets may be reduced by up to 10 percentage points (50% of the target) based on verified performance improvement. Financial support of a climate-relevant public policy initiative receives credit as an alternative to meeting the renewable electricity target. The use of eligible bioenergy also receives credit towards reducing the targets.
Gold	For construction products and building materials a third-party critical review of the quantification of embodied greenhouse gas emissions is conducted, and an Environmental Product Declaration produced. For other product types, an internal review is conducted.
	50% of electricity is renewably sourced or 50% of the resulting greenhouse gas emissions are offset. In addition, 50% of greenhouse gas emissions from all other sources are offset. 50% of the renewable electricity (25% of total electricity used) is either produced on-site or procured through long-term power purchase agreements supporting new renewable electricity installations. Applicable to final manufacturing stage only.
	Alternatives: The 50% renewable electricity and offset targets may be reduced by up to 12.5 percentage points (25% of the target) based on verified performance improvement. Financial support of a climate-relevant public policy initiative receives credit as an alternative to meeting 50% of the renewable electricity target. The use of eligible bioenergy also receives credit towards reducing the targets.
	Embodied greenhouse gas emissions data are made available to stakeholders.
	Blowing agents used in the manufacture of the product's foam materials (any foam >1% of product by weight) have low to no global warming potential and no ozone depletion potential.

	25% of the embodied emissions associated with the product from cradle to gate or through end of use are offset or otherwise addressed (e.g., through projects with suppliers, product redesign, savings during the use phase).
Platinum	For all product types, a third-party critical review of the quantification of embodied greenhouse gas emissions associated with the product from resource extraction through end of use is conducted, and an Environmental Product Declaration produced.
	> 100% of electricity is renewably sourced. The electricity is produced on-site or procured through long-term power purchase agreements supporting new renewable electricity installations. For other on-site energy demands (if any), eligible sources of bioenergy are used. > 100% of any remaining greenhouse gas emissions are offset. Applicable to final manufacturing stage only.
	100% of the embodied emissions associated with the product from cradle to gate or through end of use are offset or otherwise addressed (e.g., through projects with suppliers, product redesign, savings during the use phase).

6.3 Air Emissions Compliance

Intended Outcome(s)

The final manufacturing stage facilities where the product is manufactured are in compliance with regulatory and/or industry best practice air emissions limitations.

Applicable Achievement Level(s)

Bronze

Requirement(s)

Final manufacturing stage facilities comply with air emissions regulations or guidelines.

Facilities must comply with the corresponding regional regulatory (if any), international, or industry best-practice air emissions guidelines.

Compliance with all applicable laws and regulations, including compliance with regional regulatory air emissions limitations, is required as a baseline. For final manufacturing stage facilities meeting this requirement based on regulatory compliance, the parameters addressed in the permit must also be

consistent with leading regulations, international guidelines, or industry best practice. Leading regulations are defined as those that include a functioning mechanism through which ambient air quality-based limits are set (i.e. assessment of the existing ambient air quality is used to inform and set the permitted limits with the goal of maintaining high quality standards).

6.4 Quantifying Greenhouse Gas Emissions

Intended Outcome(s)

A product's embodied greenhouse gas emissions have been quantified and verified, creating a baseline against which reductions can be measured, and helping to identify areas for improvement.

Applicable Achievement Level(s)

Bronze, Silver, Gold, and Platinum

Requirement(s)

Bronze level: Quantify annual electricity use and greenhouse gas emissions associated with the final manufacturing stage of the product.

Silver level: Quantify the embodied greenhouse gas emissions associated with the product from resource extraction through final manufacturing or end of use. Alternative: Quantify scope 1, 2, and 3 greenhouse gas emissions for the applicant company.

Gold level: For products where life cycle assessment is common practice (i.e. construction products and building materials), conduct a third-party critical review and produce an Environmental Product Declaration (EPD). For other product types, quantify the embodied greenhouse gas emissions associated with the product from resource extraction through final manufacturing or end of use (if not already done for the Silver level), and conduct an internal review.

Platinum level: For all product types, conduct a third-party critical review of the quantification of embodied greenhouse gas emissions associated with the product from resource extraction through end of use and produce an Environmental Product Declaration (EPD).

For the Bronze level:

1. Report electricity in terms of kWh or equivalent and the resulting greenhouse gas emissions in terms of CO₂e using the location-based method.
2. Report greenhouse gas emissions from all other sources (including bioenergy) in terms of CO₂e.

For the Silver level, if quantifying scope 1, 2, and 3 emissions at the company level, the product must be included in scope. The methods employed must follow a recognized greenhouse gas accounting methodology (i.e. the Greenhouse Gas Protocol or others listed by CDP).

For the Silver, Gold, and Platinum levels, the methods employed to quantify embodied emissions must follow ISO 14040 and ISO 14044 (Environmental management -- Life cycle assessment -- Principles and framework and -- Requirements and guidelines) or other standards or guidance based on ISO 14040 and ISO 14044 (e.g. the Greenhouse Gas Protocol Product Life Cycle and Accounting Standard). If available, product category rules must be followed.

For the Gold and Platinum levels, Environmental Product Declarations (EPDs) must conform to ISO 14025 and EN 15804 or ISO 21930.

For product types where a third-party critical review is not conducted (i.e. for product types where this is not required at the Gold level), third-party verification may be requested by C2CPH should the application audit surface concerns about whether the data are complete or accurate.

6.5 Clean Air & Climate Protection Strategy

Intended Outcome(s)

A clean air and climate protection strategy that includes targets aligned with international climate science and goals is established, providing a pathway for increasing the amount of renewable energy used to manufacture the product and reducing or offsetting greenhouse gas emissions during the product manufacturing process.

Applicable Achievement Level(s)

Bronze, Silver, Gold, and Platinum

Requirements

Develop a Clean Air and Climate Protection strategy and report on progress made towards achieving the strategy at each recertification.

The strategy must include the following:

1. Quantitative targets for increasing renewable electricity use and/or procurement and addressing greenhouse gas emissions (as applicable by achievement level below).
 - a. For the Bronze, Silver, and Gold level, near-term (0-2 years) and mid-term (2-20 years) targets must be set.

- b. For the Silver and Gold levels, long-term (2050 or before; >20 years) targets must also be set.
 - c. For the Gold level, the long-term targets must be to achieve >100% renewable and/or a better than carbon neutral final manufacturing stage for the product. Alternatively, the long-term targets must be science-based (see Definitions section).
 - d. For the Platinum level, the timeline for meeting the selected target(s) may be determined by the applicant.
2. Proposed activities and method(s) for reaching each target and the rationale for selecting the specific targets, including how the targets are considered to be sufficiently ambitious. Base year(s) and target year(s) must be indicated. Note: Methods that receive credit are further described in Section 6.6 Using Renewable Electricity and Addressing Greenhouse Gas Emissions in Final Manufacturing and in 6.10 Addressing Embodied Greenhouse Gas Emissions.
3. A report of progress made towards meeting the targets that were set at the last certification renewal (not applicable for initial certification).
4. For the Bronze, Silver, and Gold levels, the estimated cost of moving to the next achievement level in the Clean Air Renewable Energy and Climate Protection category via one or more of the methods described in Section 6.6.

Scope

1. For the Bronze, Silver, and Gold levels, product attributable electricity use and greenhouse gas emissions associated with the final manufacturing stage of the product must be within the scope of the strategy.
2. For the Silver, Gold, and Platinum levels, the strategy must take into account the product's (or products') embodied greenhouse gas emissions.

6.6 Using Renewable Electricity and Addressing Greenhouse Gas Emissions in Final Manufacturing

Intended Outcome(s)

Depending on achievement level and the methods used, applicants are:

- Employing efficiency and conservation measures to reduce energy use,
- Signaling demand for renewable energy,
- Supporting carbon offset projects that go beyond business as usual,
- Avoiding the use of fuels that may contribute to reduced food security, conversion of forested and other natural areas to cropland, and/or cause a near-term increase in atmospheric carbon dioxide,

- Directly increasing the share of renewable electricity available on the local grid for all to use, and/or
- Positively impacting the balance of climate changing greenhouse gases attributable to the final manufacturing stage of the product (i.e. more are offset than are generated).

Applicable Achievement Level(s)

Bronze, Silver, Gold, and Platinum

Requirements

Renewable Electricity and Offset Targets

Bronze level: For the final manufacturing stage of the product, renewably source 5% of the electricity used, or offset 5% of the resulting greenhouse gas emissions. In addition, offset 5% of the greenhouse gas emissions from all other sources.*

Silver level: For the final manufacturing stage of the product, renewably source 20% of the electricity used, or offset 20% of the resulting greenhouse gas emissions. In addition, offset 20% of the greenhouse gas emissions from all other sources.*

Gold level: For the final manufacturing stage of the product, renewably source 50% of the electricity used, producing at least half of the 50% (i.e. 25% of the total electricity used) on-site and/or procuring half through long-term power purchase agreements supporting new renewable electricity installations. Alternatively, offset 50% of the resulting greenhouse gas emissions. In addition, offset 50% of the greenhouse gas emissions from all other sources.*

Platinum level: For the final manufacturing stage of the product, renewably source > 100% of the electricity used. Produce the electricity on-site and/or procure through long-term power purchase agreements supporting new renewable electricity installations. For other on-site energy demands (if any), use eligible bioenergy. In addition, offset > 100% of any remaining greenhouse gas emissions (i.e. from non-energy sources and/or from bioenergy receiving partial credit). *Note: The Platinum level goal is to electrify and renewably source total energy demand, and to use carbon offsets only to address any emissions from non-energy sources. However, if the physical infrastructure and/or the political situation do not allow for this, exceptions may be made on a case by case basis, allowing for the use of carbon offsets to address greenhouse gas emissions resulting from purchased electricity and/or burning of fuels onsite.*

**The targets may be reduced at the Bronze, Silver, and Gold levels when performance improvement resulting from energy conservation and efficiency projects is demonstrated. Financial support of a climate-relevant public policy initiative receives credit as an alternative to meeting the renewable electricity targets at the Bronze, Silver, and Gold levels. The use of eligible bioenergy also receives credit towards reducing the targets.*

Meeting the Renewable Electricity Targets

For the Bronze and Silver levels and for half (i.e. 50%) of the Gold level target:

1. Renewable electricity may be:
 - a. Produced on-site,
 - b. Procured from a utility or other provider (e.g. through a utility's optional green power offering, or through direct power purchase agreements), and/or
 - c. Procured via unbundled renewable energy attribute certificates that support new (≤ 15 years) renewable electricity installations (e.g. Renewable Energy Certificates (RECs) or Guarantees of Origin (GOs)). Note: 'Unbundled' refers to renewable energy attributes that are sold separately from the renewable electricity itself.
2. If procuring renewable electricity from a utility, the renewable sources as defined by the European Union's Renewable Energy Directive, the relevant state's Renewable Portfolio Standard(s) in the United States, or similar for other regions, receive credit (Note: This may include impoundment hydropower in some locations). Otherwise, the electricity must be from one or more of the following sources:
 - a. Solar,
 - b. Wind,
 - c. Geothermal,
 - d. Non-impoundment hydropower, or
 - e. Eligible biofuels (see On-Site Produced Bioenergy Credit section below).
 - f. Other renewable sources (e.g. wave and tidal energy) will be evaluated on a case-by-case basis
3. Renewable electricity that is part of a utility's default offer (i.e. renewable electricity that is part of the standard grid mix) may receive credit towards achieving the renewable electricity targets only if there is no voluntary renewable electricity market in the applicable market region. (Note: The alternative option, including for cases where there is a voluntary renewable electricity market, is to convert the amount of purchased electricity to greenhouse gas emissions using residual location-based emissions factors and to meet the offset target instead – which does give credit for using renewable electricity present on the grid through that electricity's effect on the emissions rate).
4. Double counting of renewable energy attributes must not occur.
 - a. Renewable energy attribute certificates must be retained by the applicant or canceled on the applicant's behalf in all cases.
 - b. If procuring unbundled renewable energy attribute certificates outside of a regulated tracking system that controls for double counting, a qualified third-party must verify that double counting has not occurred.

5. The generation or consumption of the renewable electricity may not be used to meet any regulatory requirements. (Note: This is addressed via the requirement to retain or cancel attribute certificates in #4a above in most cases, but may need to be separately verified for on-site generation.)

For the remaining half (i.e. 50%) of the Gold target and for the Platinum level target:

1. The renewable electricity must be:
 - a. Produced and consumed on-site to the extent feasible, and/or
 - b. Procured through long-term (≥ 15 years) power purchase agreements that support new (≤ 15 years) renewable electricity installations.
2. The electricity must be from one or more of the following sources:
 - a. Solar,
 - b. Wind,
 - c. Geothermal,
 - d. Non-impoundment hydropower, or
 - e. Eligible biofuels (see On-Site Produced Bioenergy Credit section below).
 - f. Other renewable sources (e.g. wave and tidal energy) will be evaluated on a case-by-case basis.
3. Power purchase agreements must support renewable electricity generation that occurs:
 - a. In the same grid region as the applicant's facility(ies), or
 - b. In a grid region with higher emissions rates than the region where the applicant's facility(ies) are located.
4. Double counting of renewable energy attributes and/or use for regulatory compliance must not occur (per #4 and #5 of the preceding section).

Alternative to Meeting the Renewable Electricity Targets

For the Bronze and Silver levels and for half (i.e. 50%) of the Gold level target:

1. A donation or in-kind contribution (e.g. staff time) valued in an amount that is twice (i.e. 2x) the cost of purchasing renewable electricity through a utility's green power offering or unbundled renewable energy attribute certificates is accepted as an alternative to achieving the renewable electricity targets.
2. The contribution must support a project or initiative that aims to positively impact local, regional, or international climate-relevant public policy.

Note: This alternative may not be used for the remaining half (i.e. 50%) of the Gold level target or at the Platinum level.

Meeting the Carbon Offset Targets

To claim and apply carbon offsets towards the offset target(s), the following conditions must be met:

1. Offsets must be sourced from projects certified to a C2CPH-recognized offset project certification program that aims to ensure that:
 - a. The associated greenhouse gas reductions or removals are additional, accurately estimated, permanent, and not double counted.
 - b. Offset projects operate in compliance with local laws.
2. The offsets must be purchased voluntarily (and not for compliance purposes).
3. If using carbon offsets to address emissions attributable to the use of purchased electricity (i.e. scope 2 emissions):
 - a. Emissions attributable to the purchased electricity must be calculated using the location-based method.
 - b. A nuclear power penalty must be added to the total CO₂e subject to the offset targets for cases where nuclear power is included in the grid mix. The penalty is equal to the greenhouse gas emissions that would have occurred if any nuclear power used had instead been produced from coal.

Accounting for Bioenergy and Applying the Bioenergy Credit

If bioenergy is produced on-site (including use of biofuels), the greenhouse gas emissions attributable to the bioenergy must be added to the total CO₂e subject to the offset targets.

If the bioenergy is produced from eligible fuels, the bioenergy credit may also be subtracted from the amount of offsets required to reach a given target. The bioenergy credit = (the carbon dioxide combustion emissions of the eligible biofuel) x (the bioenergy credit multiplier for the eligible fuel source type). In addition to receiving the bioenergy emissions credit for the use of eligible biofuels, electric bioenergy produced on-site from these fuels may also be counted toward the renewable electricity target.

Eligible fuels are solid, liquid, or gaseous forms of fuel sourced from organic and renewable materials that would otherwise be categorized as waste as defined by the most recent version of the Green-e® Renewable Energy Standard for Canada and the United States.

The bioenergy credit multipliers by eligible fuel source type are as follows (see the Definitions section for a description of the approach used to define these multipliers):

1. Agricultural crop residue that is unmerchantable as food and other similar rapidly renewable waste material: 0.63
2. Animal and other organic waste (e.g. food scraps), landfill gas, and wastewater methane: 1
3. Woody waste: 0.57

To receive the bioenergy credit, the applicant must retain all rights to the environmental attributes associated with the bioenergy. Emissions reductions attributes may not be sold, registered, or claimed by others.

Bioenergy must be produced on-site and any biofuels must be used directly to receive the bioenergy credit with the following exception: For the Bronze and Silver levels, 'green-gas' certificates may be employed to compensate for natural gas obtained through the standard gas grid. New (≤ 15 years) biogas installations must be supported. Carbon offsets supporting bioenergy installations receive credit as described above in the section titled Meeting the Carbon Offset Targets.

Optional Performance Improvement Credit

The renewable electricity and/or offset targets may be reduced when performance improvement(s) resulting from energy conservation and efficiency projects have been demonstrated and verified by a qualified third-party. In general, the renewable electricity and offset targets may be reduced by one percentage point for each percent of normalized performance improvement achieved, within the following limits:

1. For Bronze Level: The 5% renewable electricity and offset targets may be reduced by up to five percentage points (100% of the targets). If performance improvement(s) of 5% or more have been achieved, renewable electricity or offsets are not required.
2. For Silver level: The 20% renewable electricity and offset targets may be reduced by up to 10 percentage points (50% of the targets). If the maximum performance improvement credit of 10% has been achieved, only 10% of electricity must be renewably sourced and only 10% of greenhouse gas emissions must be offset.
3. For Gold level: The 50% renewable electricity and offset targets may be reduced by up to 12.5 percentage points (25% of the targets). If the maximum performance improvement credit of 12.5% has been achieved, only 37.5% of electricity must be renewably sourced and only 37.5% of greenhouse gas emissions must be offset.
4. The performance improvement credit may not be used towards fulfillment of the Platinum level targets.

The performance improvement credit may be applied when all of the following conditions are met:

1. Performance improvement is achieved at a facility that is part of the product's final manufacturing stage.
2. The product is allocated a share of overall facility energy use and emissions proportional to its share in the facility's overall production. (This is required prior to determining the amount of carbon offsets and/or renewable electricity necessary to meet the remainder of the target(s)).
3. Performance improvements are determined using a baseline year of no more than 10 years prior to certification or recertification (as applicable).
4. Performance improvements from baseline to reporting year must be determined and normalized per an approved method and verified by a qualified third-party with expertise in energy performance measurement and verification.

- a. The International Performance Measurement and Verification Protocol (IPMVP), Method C (i.e. the whole facility method), or similar methods based on ISO 50015 and ISO 50047, are accepted.
- 5. The verifier must report performance improvement(s) in the appropriate quantities depending on how the remainder of the targets will be met as follows:
 - a. Performance improvement must be reported separately for electricity and all other greenhouse gas emissions sources (required if meeting renewable electricity and carbon offset targets); or,
 - b. Total performance improvement for all energy sources combined must be converted to and reported as percentage of CO₂e savings achieved (i.e. avoided emissions).
- 6. The reporting year for the performance improvement verification report must be within one year of the certification issue date. Verification must be repeated upon each recertification.
- 7. The applicant must retain all rights to the environmental attributes associated with the performance improvement.

6.7 Energy Efficiency During Product Use

Intended Outcome(s)

Manufacturers are incentivized to make energy efficient products and product users are able to identify and select products that perform efficiently.

Applicable Achievement Level(s)

Bronze

Requirement(s)

For products that use energy during the use phase (e.g. appliances) or that greatly impact the energy efficiency of buildings (e.g. windows, insulation), obtain a certification and/or label using a C2CPH-recognized energy efficiency standard, labeling program, or similar, if available.

C2CPH-recognized efficiency standards and labels must allow users to identify products with above-average performance (e.g. EU Energy Label and EnergyStar in the US).

Certification or labelling is required if a relevant certification or label is available in the region(s) where the product is sold.

6.8 Transparency

Intended Outcome(s)

Greenhouse gas emissions data are available to stakeholders, demonstrating the manufacturer's commitment to protecting the climate.

Applicable Achievement Level(s)

Bronze and Gold

Requirement(s)

Bronze level: Make greenhouse gas emissions data for the applicant company, all final manufacturing stage facilities, or the final manufacturing stage of the product available to stakeholders.

Gold level: Make embodied greenhouse gas emissions data for the product available to stakeholders. For product types where life cycle assessment is common practice (i.e. construction products and building materials), make an Environmental Product Declaration available.

For the Bronze level, scope 1 and scope 2 emissions must be reported separately.

6.9 Using Blowing Agents with Low or No Global Warming Potential

Intended Outcome(s)

Blowing agents used in the product's manufacturing and supply chain do not contribute to climate change or depletion of the ozone layer.

Applicable Achievement Level(s)

Gold

Requirement(s)

For blowing agents used to manufacture foam materials, use blowing agents with low to no global warming potential (GWP) and no ozone depletion potential (ODP).

Blowing agents with a RED or GREY hazard rating in the Climatic Relevance endpoint (as defined by the C2CPII *Material Health Assessment Methodology*) must not be used. This is required regardless of

whether or not the blowing agent remains within the final product and regardless of whether the blowing agent is used during the final manufacturing stage or in the supply chain.

Exemption

Blowing agents used to manufacture foam materials if the foam material makes up < 1% of the product by weight.

6.10 Addressing Embodied Greenhouse Gas Emissions

Intended Outcome(s)

Offsetting or reducing embodied GHG emissions has demonstrably decreased the proportion of climate-changing greenhouse gases attributable to manufacturing of the product.

Applicable Achievement Level(s)

Gold and Platinum

Requirement(s)

Gold level: Offset or otherwise address 25% of embodied greenhouse gas emissions attributable to the product from resource extraction through final manufacturing or through end of use.

Platinum level: Offset or otherwise address 100% of embodied greenhouse gas emissions attributable to the product from resource extraction through final manufacturing or through end of use.

At a minimum, a cradle to gate scope including emissions attributable to the final manufacturing stage must be employed.

Embodied greenhouse gas emissions may be addressed through a variety of methods, including but not limited to, the purchase of carbon offsets, projects with suppliers, product redesign, and savings during the use phase.

Reduction in embodied greenhouse gas emissions per functional unit receives credit when compared to a baseline of no more than 10 years prior to certification or recertification (as applicable).

Above average performance (lower embodied emissions per functional unit) receives credit when compared to an industry-wide third-party verified benchmark, if available. An industry-wide generic EPD published in the past five years may be used as the benchmark. Otherwise, the performance of a sample of similar products may be used for comparison.

Qualified third-party verification of the percentage addressed is required if meeting the targets through methods other than offset purchase.

7 // WATER AND SOIL STEWARDSHIP REQUIREMENTS

7.1 Category Intent

Water and soil are treated as precious and shared resources. Watersheds and soil ecosystems are protected, and clean water and healthy soils are available to people and all other organisms.

7.2 Requirements Summary

To achieve a desired level within the category, the requirements at all lower levels must also be met.

Bronze	Local and product-relevant water and soil issues are characterized. (Required for final manufacturing stage facilities and select tier 1 suppliers of key materials.)
	Final manufacturing facilities comply with water quality regulations or guidelines - i.e. permits, international guidelines, or industry best practice.
	Product-relevant chemicals entering effluent or sludge comply with the relevant restrictions on the Core Restricted Substances List (RSL). (Required for final manufacturing stage.)
	Water use at final manufacturing stage facilities is quantified.
	Adequate drinking water, sanitation, and hygiene are provided (final manufacturing stage facilities only).
	A strategy for achieving the Silver level water and soil conservation requirements has been developed. For facilities using high volumes of water in stressed locations, the strategy includes water use reduction targets. Progress is reported at recertification.
	Manufacturing facilities of tier 1 suppliers comply with water quality regulations or guidelines - i.e. compliance with permits, international guidelines, or industry best practice. (Required for tier 1 suppliers of key materials associated with pollutant intense processes.)
	The Bronze level water and soil conservation strategy has been implemented including:

Silver	<ul style="list-style-type: none"> ○ At least one conservation technology or best practice at facilities expected to have the greatest water- or soil-related impacts. (Required for final manufacturing facilities with high volume processes in stressed locations and facilities with pollutant intense processes.) ○ One additional action to conserve water and/or soil either at final manufacturing facilities or in the supply chain. (Required when there are any facilities with high volume or pollutant intense processes and/or in stressed locations, or key materials in scope.)
	Product-relevant process chemicals entering effluent and sludge are defined and assessed.
	Product-relevant effluent and sludge does not contain recognized PBTs, vPvBs, or EU CLP Cat.1 & 2 CMRs, or substances causing an equivalent level of concern, or exposure via effluent and sludge is unlikely or expected to be negligible. (Required for final manufacturing stage.)
	Water use data are made available to stakeholders.
	A strategy for achieving the Gold level water and soil conservation requirements has been developed. Progress is reported at recertification.
Gold	<p>The Silver level water and soil conservation strategy has been implemented including:</p> <ul style="list-style-type: none"> ○ Conservation technologies and best practices at facilities expected to have the greatest water- and/or soil-related impacts. (Required for all final manufacturing facilities with high volume or pollutant intense processes and/or in stressed locations.) ○ Actions to conserve water and/or soil in the supply chain, including the use of certified materials, working as part of multi-stakeholder group(s), and/or working directly with suppliers to implement water and soil stewardship requirements and address the processes of concern. (Required for key materials in scope.)
	Product-relevant chemicals in effluent and sludge are assessed and optimized (i.e. none are x-assessed or grey-rated). (Required for the final manufacturing stage and for key materials where pollutant intense processes occur at tier 1, or at any tier for leather, metal finishing, pulp/paper & textiles.)

	A positive impact project that addresses local and/or product-relevant water and/or soil issues has been implemented.
Platinum	Water quality data are made available to stakeholders.
	Impact of positive impact project demonstrated.
	<p>For final manufacturing stage facilities:</p> <ul style="list-style-type: none"> ○ A comprehensive effluent and sludge quality management system has been established, and ○ Effluent and sludge produced as a result of all manufacturing processes used at the facility are optimized.

7.3 Characterizing Local and Product Relevant Water and Soil Issues

Intended Outcome(s)

Through the assessment and understanding of water- and soil-related impacts attributable to the product, including local water availability and quality issues relevant to the product's manufacturing facilities, opportunities to address the impacts are identified.

Applicable Achievement Level(s)

Bronze

Requirement(s)

Characterize local and product-relevant water and soil issues.

For all final manufacturing stage facilities:

1. Determine the basin/catchment/watershed name.
2. Identify risks to water quantity (including baseline water stress) and water quality, and risk of unimproved or no access to drinking water and sanitation as defined by the most recent version of the World Resources Institute Aqueduct database or equivalent.
3. If a catchment level plan is available, obtain, review, and determine how the plan is relevant to the site. This must include a determination of whether a groundwater abstraction cap (i.e. a

regulatory limit on total withdrawals) based on water resource availability has been set, and if so, the cap's relevance to the site.

4. Describe effluent and sludge treatment process(es).
5. If third-party treatment facilities are employed, identify the provider(s) and describe any issues with their ability to adequately treat effluent received from the facility.
6. Identify any known issues with source and/or receiving water contamination (e.g. due to the use of reclaimed water) or high concentrations of naturally occurring hazardous substances.
7. Describe any known issues with soil contamination, erosion, or other types of degradation at the site.
8. Determine if the facility is potentially impacting any sensitive ecosystems, protected areas, or similar.

For the product: Identify the use cycle stage(s) (also commonly referred to as 'life cycle' stages) responsible for the majority of water quantity and quality related impacts. Describe the impacts of concern.

For facilities of tier 1 suppliers of key materials that make up $\geq 25\%$ of the product by weight or by cost, or for all tier 1 suppliers:

1. Determine the basin/catchment/watershed name
2. Identify risks to water quantity (including baseline water stress) and water quality, and risk of unimproved or no access to drinking water and sanitation as defined by the most recent version of the World Resources Institute Aqueduct database or equivalent.

Key Materials

A key material is defined as a material that is typically produced using pollutant intense or high volume water use processes (see C2CPII *Water and Soil Stewardship – Key Materials* reference document for the list of applicable materials and processes).

The key materials in scope for the Water and Soil Stewardship requirements must be determined at the generic material level (e.g. if several aluminum parts are used, the total weight of aluminum applies). If there are no key materials present at $\geq 25\%$ when aggregated by generic material type, but the sum of all key materials is $\geq 25\%$, the requirements for key materials must be applied to the key materials representing the highest weight or cost fractions of the product until $< 25\%$ of the product includes key materials to which the requirements have not been applied. If the 25% threshold is met when using only weight or only cost, then the metric that results in meeting the 25% threshold must be used.

Alternative: Water and soil conservation (quantity and quality) impact hot spots, identified based on conducting a life cycle assessment per ISO 14040, may be used instead of key materials that make up

≥ 25% of the product by weight or by cost for all Water and Soil Stewardship requirements applying to key materials. The assessment must be verified by a qualified third party.

7.4 Effluent Quality Compliance

Intended Outcome(s)

Final manufacturing stage and select supplier facilities are in compliance with regulatory and/or industry best practice effluent limitations.

Applicable Achievement Level(s)

Bronze and Silver

Requirement(s)

Bronze level: For the final manufacturing stage, treat effluent (either on or off-site) prior to discharge to the environment and adhere to effluent quality regulations or guidelines.

Silver level: For select tier 1 supplier facilities, treat effluent (either on or off-site) prior to discharge to the environment and adhere to effluent quality regulations or guidelines.

Facilities discharging effluent directly to surface or groundwater must comply with the corresponding regional regulatory (if any), international, or industry best-practice effluent quality guidelines for direct discharge. (Note: Facilities discharging via a sewer system that does not route to an effluent treatment facility with at least secondary treatment capabilities or equivalent are discharging directly to surface or groundwater for the purposes of this requirement.)

Bronze level

For final manufacturing stage facilities meeting this requirement based on regulatory compliance, the parameters addressed in the permit must also be consistent with leading regulations, international guidelines, or industry best practice. Leading regulations are defined as those that include a functioning mechanism through which water quality-based limits are set.

Final manufacturing stage facilities discharging process effluent to an off-site, independently operated effluent treatment facility (e.g. publicly owned treatment works, central effluent treatment plant, or wastewater treatment plant) with at least secondary treatment must:

1. Comply with required pretreatment limits, if any, AND
2. Demonstrate that the treatment facility is treating the effluent received to quality standards in line with the corresponding regional regulatory (if any) or international guidelines.

OR

Comply with regional regulatory (if any), international, or industry best practice effluent quality guidelines for direct discharge.

Silver level

Select tier 1 supplier facilities discharging process effluent to an off-site, independently operated effluent treatment facility (e.g. publicly owned treatment works, central effluent treatment plant, or wastewater treatment plant) with at least secondary treatment must comply with required pretreatment limits, if any.

The 'select' tier 1 supplier facilities in scope are those producing key materials associated with pollutant intense processes (per the C2CPII *Water Stewardship - Key Materials* reference document) that make up $\geq 25\%$ of the product by weight or by cost.

Effluent testing

When effluent must be tested for verification purposes, sampling and testing must be conducted according to the methods specified by regulatory permits, the off-site, independently operated effluent treatment facility, and/or other guidelines as relevant. The analytical laboratory conducting the tests must be accredited or certified for the specific analysis per ISO 17025, NALEP, or equivalent.

7.5 Quantifying Water Use

Intended Outcome(s)

Water withdrawals, discharge, and consumption at facilities manufacturing the product(s) are quantified, creating a baseline against which reductions can be measured, and helping to identify areas for improvement.

Applicable Achievement Level(s)

Bronze

Requirement(s)

Quantify annual water withdrawals, discharge, and consumption for all final manufacturing stage facilities.

Data must be collected on the following and the data sources indicated:

1. Withdrawals by source and water type,
2. Discharges by receiving body/destination,

3. Capacity of onsite treatment equipment,
4. Consumption by source,
5. Total amount and percentage of water recycled and reused.

Facilities that withdraw or purchase $\geq 100,000 \text{ m}^3$ of water per year are considered as having high volume processes.

7.6 Providing Drinking Water, Sanitation, and Hygiene

Intended Outcome(s)

Access to drinking water, sanitation, and hygiene is treated as a basic requirement at the facilities where the product is manufactured.

Applicable Achievement Level(s)

Bronze

Requirement(s)

Provide potable drinking water, adequate sanitation, and hygiene to all workers at all final manufacturing stage facilities.

The following conditions must be met:

1. Potable water must be dispensed using a clean and accessible method.
2. An adequate number of toilets per employee must be provided as required by local regulations or international guidelines if local regulations do not exist. The applicant must ensure that sewer and/or portable toilets:
 - a. Provide privacy at all times (i.e. may be locked from the inside).
 - b. Are separate for each sex. Alternatively, toilet facilities will not be occupied by more than one employee at a time, can be locked from the inside, and contain at least one toilet.
 - c. If portable toilets are provided, they must be vented and equipped with lighting.
 - d. Are accessible to all employees including disabled people and people with reduced mobility wherever current employees require such accommodations.
3. Hand washing facilities must be located at or adjacent to each toilet facility and must be equipped with one of the following:
 - a. Running water and soap.

- b. Waterless skin-cleansing agents capable of disinfecting the skin or neutralizing the contaminants to which the employee may be exposed.
- 4. A sanitary method of drying hands after washing must be provided.
- 5. The applicant must establish and implement a maintenance and cleaning schedule with the goal of ensuring that each toilet and handwashing area is maintained in a clean, sanitary, and serviceable condition (including provision of toilet paper or other hygienic option).
- 6. Reasonable access to drinking water, sanitation, and hygiene facilities must be provided (i.e. either freely accessible at any time as needed by employees or, at a minimum, readily available upon request).

7.7 Water and Soil Stewardship Strategy

Intended Outcome(s)

A water and soil stewardship strategy is developed, providing an actionable pathway towards operating in a manner that protects water and soil resources.

Applicable Achievement Level(s)

Bronze and Silver

Requirement(s)

Bronze level: Develop a strategy for achieving the Silver level water and soil conservation requirements and report on progress made towards achieving the strategy at each recertification.

Silver level: Develop a strategy for achieving the Gold level water and soil conservation requirements and report on progress made towards achieving the strategy at each recertification.

For the Bronze level, the strategy must be designed with the aim of eventually achieving the Silver level as described in Section 7.8 Water and Soil Conservation.

For final manufacturing stage facilities with high volume processes that are also in medium to high stress locations, the strategy must also include quantitative water use reduction targets, informed by the Quantifying Water Use requirements (Section 7.5), including:

- 1. Near-term (defined as 0-2 years) and mid-term (defined as 2-20 years) targets.
- 2. Proposed activities and method(s) for reaching each target.
- 3. Base year(s) and target year(s) must be indicated.

4. A report of progress made towards meeting the targets that were set at the last certification including percent reductions in use and increases in percent recycling achieved (not applicable for initial certification).

For the Silver level, the strategy must be designed with the aim of eventually achieving the Gold level as described in Section 7.8 Water and Soil Conservation.

All strategies must include specific goal(s) and associated timelines for implementation.

7.8 Water and Soil Conservation

Intended Outcome(s)

Conservation technologies and best practices are increasingly being implemented to reduce water use and/or improve effluent and/or soil quality where there are known issues.

Applicable Achievement Level(s)

Silver and Gold

Requirement(s)

Silver level: Implement at least one conservation technology or best practice at all final manufacturing stage facilities with high volume processes in stressed locations and/or with pollutant intense processes, and take at least one additional action to conserve water and/or soil at final manufacturing stage facilities or in the supply chain.

Gold level:

1. Implement conservation technologies or best practices at all final manufacturing stage facilities with high volume or pollutant intense processes, and/or in stressed locations.
2. For key materials that make up $\geq 25\%$ of the product by weight or by cost, take action to conserve water and/or soil in the supply chain.

Silver Level

For final manufacturing stage facilities with high volume processes in medium to high stress locations, at least one technology or best practice leading to water use reductions must be implemented, and

For final manufacturing stage facilities with pollutant intense processes, at least one technology or best practice leading to improved effluent quality must be implemented, and

One of the Gold level requirements must also be implemented for at least one final manufacturing stage facility or for one key material that makes up $\geq 25\%$ of the product by weight or by cost. (Required unless there are no final manufacturing stage facilities or key materials in scope for the Gold level requirements.)

High-volume and pollutant intense processes by material type are listed in the C2CPII *Water and Soil Stewardship - Key Materials* reference document. Stress level is defined using the baseline water stress metric first referenced in Section 7.3.

Gold Level

For final manufacturing stage facilities with high volume processes in medium to high stress locations, technologies or best practices leading to the maximum feasible water use reductions must be implemented, and

For final manufacturing stage facilities with high volume processes in low stress locations, at least one technology or best practice leading to water use reductions must be implemented, and

For final manufacturing stage facilities in high stress locations without high volume processes, at least one technology or best practice leading to water use reductions must be implemented, and

For final manufacturing stage facilities with pollutant intense processes, technologies or best practices leading to the maximum feasible improvement in effluent quality must be implemented.

For key materials that make up $\geq 25\%$ of the product by weight or by cost:

1. For forest and agricultural raw materials where there is extensive evidence of highly negative water quantity and/or quality (which is broadly defined for some key materials to include soil erosion) related impacts (e.g. cotton, palm oil, wood):
 - a. The material must be certified to a C2CPII-recognized standard that addresses the processes of concern (per the C2CPII *Water and Soil Stewardship - Key Materials* reference document) or an equivalent alternative to certification must be in place.
 - b. Alternatively, for the Gold level (i.e. not an option for the Platinum level), the following are required:
 - i. An explanation of the limitation(s) preventing the incorporation of the required percentage(s) of certified material and how, based on these limitation(s), the amount of certified material currently used represents the maximum that is currently feasible.
 - ii. The explanation must be reported publicly.
 - iii. A strategy for addressing the identified limitation(s) and increasing the amount of certified material over time must be developed. The strategy must include discrete objectives and an associated timeline.
 - iv. For recertification:

1. The applicant must demonstrate progress towards achieving the objectives.
2. A description of progress made must be reported publicly.
2. For other material types:
 - a. A C2CPH-recognized certification or alternative that addresses the processes of concern must be in place (the alternative described in 1b above may be applied), or
 - b. The applicant must be actively involved with a multi-stakeholder group working to address the processes of concern, or
 - c. The applicant must work directly with suppliers of key materials to implement the Water and Soil Stewardship requirements (per the Alternative for Key Materials section below).

Alternative for Key Materials: Working with Suppliers to Implement Water and Soil Stewardship Requirements

The following receives credit as an alternative to using certified materials, implementing alternatives, or working with a multi-stakeholder working group to address water- and soil-related issues of concern:

For the Gold level, suppliers of key materials must fulfill the following requirements:

1. Local and Product-Relevant Water and Soil Issues must be characterized (per Section 7.3)
2. For supplier facilities producing key materials associated with high volume processes and located in medium to high stress locations: At least one technology or best practice leading to water use reductions must be implemented.
3. For supplier facilities producing key materials associated with pollutant intense processes:
 - a. The Effluent Quality Compliance requirements must be fulfilled (per Section 7.4), and
 - b. At least one technology or best practice leading to improved water and/or soil quality must be implemented.

7.9 Assessing & Optimizing Product Relevant Chemicals in Effluent and Sludge

Intended Outcome(s)

Chemicals entering receiving waters and soils as a result of product manufacturing have been intentionally selected based on their preferred safety attributes.

- At the Bronze level, in alignment with leading regulations that aim to protect human health and the environment, the release of well-known toxic chemicals is avoided.

- At the Silver level, chemicals classified as carcinogenic, mutagenic, or reproductive toxicants (CMRs) are not used, or, if these substances are present, exposure to them is unlikely or expected to be negligible. In addition, persistent, bioaccumulative, and toxic (PBTs) or very persistent and very bioaccumulative (vPvBs) substances are not used. The product also does not contain substances that cause an equivalent level of concern or exposure to them is unlikely or expected to be negligible.
- At the Gold level, chemicals used are compatible with human and environmental health according to the Cradle to Cradle Certified Material Health Assessment Methodology. Exposure to hazardous chemicals via product relevant effluent and sludge is unlikely or expected to be negligible.

Applicable Achievement Level(s)

Bronze, Silver, and Gold

Requirement(s)

Bronze level: All product-relevant chemicals entering effluent or sludge during the final manufacturing stage comply with the relevant restrictions on the Core Restricted Substances List (RSL).

Silver level:

- Define and assess product-relevant process chemicals entering effluent or sludge during the final manufacturing stage and develop a strategy for optimization.
- Ensure that any product-relevant chemicals (including product relevant process chemicals) released with effluent or sludge during the final manufacturing stage:
 - Are not classified or listed as known or suspected to cause cancer, birth defects, genetic damage, reproductive harm (CMRs), or cause an equivalent level of concern, or, if these substances are released, that exposure is unlikely or expected to be negligible, and
 - Are not listed as persistent, bioaccumulative, and toxic (PBTs), very persistent and very bioaccumulative (vPvBs).

Gold level:

- Define and assess all product-relevant chemicals entering effluent or sludge during the final manufacturing stage and at select supplier facilities.
- Ensure that any product-relevant chemicals released with effluent or sludge during the final manufacturing stage or at select supplier facilities are compatible with human and environmental health according to the Cradle to Cradle Certified Material Health Assessment Methodology, allowing only a, b, and c assessed chemicals within effluent and sludge.

For the Bronze level,

1. Product-relevant chemicals are defined as intentional product inputs and process chemicals (including single chemicals and chemical mixtures) used to manufacture the product. (Note: Process chemicals are further defined in the Definitions section).
2. All product-relevant chemicals that enter or potentially enter the effluent are in scope.
3. If applicable, restriction thresholds apply to the chemical mixtures as received from the supplier.

For the Silver level,

1. For process chemical formulations, all substances present at 1000 ppm (0.1%) or above within the formulation are subject to review. Substances may be grey-rated due to missing toxicity information and otherwise must have received an abc-x rating.
2. CMRs are defined as substances that have received a harmonized classification of Category 1 or 2 in one or more of the CMR endpoints as listed within the EU's Classification, Labelling and Packaging regulation (CLP) Annex VI, or are CMR substances listed on the REACH Candidate list of Substances of Very High Concern (SVHC) for Authorisation (including those on Annex XIV). PBTs, vPvBs, and substances causing an equivalent level of concern are defined per the REACH Candidate list of Substances of Very High Concern (SVHC) for Authorisation (including those on Annex XIV).

For the Gold level, the 'select' suppliers in scope are:

1. Tier 1 suppliers to the final manufacturing stage and suppliers that carry out pollutant intense processes associated with the following material types regardless of tier: leather, metal finishes, pulp and paper, and textiles, and
2. Suppliers that produce key materials with pollutant intense processes for materials that make up $\geq 25\%$ of the product by weight or by cost.

7.10 Transparency

Intended Outcome(s)

Water use and effluent quality data for final manufacturing stage facilities are available to stakeholders, demonstrating the manufacturer's commitment to water stewardship.

Applicable Achievement Level(s)

Silver and Platinum

Requirement(s)

Silver level: Make water use data for final manufacturing stage facilities available to stakeholders.

Platinum level: Make effluent quality data for the final manufacturing stage available to stakeholders.

The data must include:

1. For the Silver and Platinum levels, all reporting requirements relevant to water use (i.e. withdrawals, consumption, and discharge) per the most recent version of the Global Reporting Initiative (GRI) 303 - Water, or equivalent.
2. For the Platinum level, effluent quality test reports as required for verification of the Effluent Quality Compliance requirements (see Section 7.4).

7.11 Positive Impact Project

Intended Outcome(s)

Water and/or soil quality, water quantity, or the health of aquatic and/or soil ecosystems within the catchment(s) where the manufacturer, employees, customers, and/or suppliers are located is improved through initiation or participation in a collaborative project.

Applicable Achievement Level(s)

Gold and Platinum

Requirement(s)

Gold level: Implement a project that will positively impact local and/or product-relevant water or soil issues.

Platinum level: Demonstrate the impact of the positive impact project using quantitative metric(s).

The project must:

1. Reach beyond the final manufacturing stage facility and into the value chain and/or local community and aim to positively impact aquatic and/or soil ecosystems, local communities, water and/or soil quality and/or water quantity within the catchment(s) where the manufacturer, employees, customers, and/or suppliers are located.
2. Include direct involvement by company employees and/or senior management.

3. Address one or more of the issues identified in the Characterize Local and Product Relevant Water and Soil Issues requirement (Section 7.3) or otherwise be material to the applicant company.

7.12 Optimizing Effluent and Sludge Quality at the Facility-Level

Intended Outcome(s)

Effluent and sludge at final manufacturing facilities are managed with the aim of protecting local water quality and ecosystem health.

Applicable Achievement Level(s)

Platinum

Requirement(s)

For the final manufacturing stage facilities:

- Establish a comprehensive effluent and sludge quality management system, and
- Optimize the effluent and sludge produced as a result of all manufacturing processes used at the facility.

The following are in scope:

1. Effluent and sludge produced as a result of all manufacturing processes at the facility.
2. Non-manufacturing effluent and sludge (e.g. from water used in toilets, kitchen areas) unless treated by an off-site, independently operated effluent treatment facility.
3. All chemicals with potential to enter effluent and sludge including, but not limited to:
 - a. process chemicals,
 - b. intentional product inputs,
 - c. chemicals used to treat and clean cooling systems,
 - d. chemicals used to treat the effluent, and
 - e. custodial/cleaning chemicals used in the manufacturing area.

Managing Effluent and Sludge Quality

The comprehensive effluent quality management system must:

1. Be informed by an understanding of:
 - a. The hazardous substances (defined as substances with RED hazard(s) per the Material Health Assessment Methodology) used by the facility and the industry. This must be determined based on a comprehensive review of safety data sheets and the relevant

literature on chemicals of known and emerging concern, both regulated and non-regulated. (Note: this is different from the chemical inventory required for materials and products in the Material Health category.)

- b. Local and catchment level water quality issues that are relevant to the facility, surrounding ecosystem, and community, including the quality of source and receiving waters, and the health of receiving ecosystems, determined per the Characterize Local and Product Relevant Water Issues requirement (Section 7.3) and communication with non-governmental organizations (NGOs) working on local water issues and/or local water authorities.
2. Include comprehensive methods for avoiding the intentional and unintentional use, and subsequent introduction, of hazardous substances to the environment via effluent and sludge. The methods must address all chemicals in scope and may include but are not limited to:
 - a. Use of third-party certified and optimized input formulations and materials,
 - b. Analytical testing of purchased formulations to screen for hazardous contaminants, and
 - c. Adherence to industry best practice manufacturing restricted substance lists.
3. Include qualified third-party verification that processes and procedures for onsite treatment facility operation (if any) and water quality management are in place and functioning.
4. Monitor conventional water quality parameters (e.g. pH, total suspended solids, biochemical oxygen demand), and for the release of hazardous substances relevant to the industry and facility. The following are required:
 - a. Effluent as it leaves the facility must be tested for all substances of concern identified per the required research (per #1).
 - b. Best practices must be used to collect samples.
 - c. Testing must be conducted at least two times per year.
 - d. Laboratories conducting the tests must be ISO 17025 accredited.

Optimizing Effluent and Sludge Quality

1. For conventional water quality parameters, facility(ies) releasing effluent directly to surface or groundwater (defined in Section 7.4) must comply with the more stringent of the limitations indicated by either their permits or as follows:
 - a. pH: 6-9
 - b. Biological Oxygen Demand (BOD): 25 mg/L
 - c. Chemical Oxygen Demand (COD): 100 mg/L
 - d. Total Suspended Solids (TSS): 30 mg/L
 - e. Ammonia (as N): 10 mg/L
 - f. Total nitrogen: 10 mg/L
 - g. Total phosphorus: 2.0 mg/L

- h. Temperature: <3 °C increase
- i. Color: 7 m⁻¹ (436 nm; yellow) 5 m⁻¹ (525 nm; red) 3 m⁻¹ (620 nm; blue)
- j. Oil and grease: 10 mg/L
- k. Coliform: 400 bacteria/100 ml

Applicants who would be required to comply with effluent limits more stringent than what is indicated by their permits may alternatively publicly disclose an explanation of the conditions and/or trade-offs preventing the facility from meeting the more stringent limits.

These effluent limits are the most stringent of those listed for multi-brand consortia or for the benchmark countries (if not included in multi-brand consortia list) per Zero Discharge of Hazardous Chemicals Programme, Textile Industry Wastewater Discharge Quality Standards Literature Review REV1, 2015.

<https://www.roadmaptozero.com/fileadmin/pdf/WastewaterQualityGuidelineLitReview.pdf>

- 2. Hazardous substances identified per the required research (per the Effluent and Sludge Quality Management section #1) must not be x-assessed in effluent or sludge (per the Material Health Assessment Methodology section on assessment of effluent & sludge).

Receiving water is defined as the ultimate receiving water in the case of off-site, independently operated effluent treatment facility.

8 // SOCIAL FAIRNESS REQUIREMENTS

8.1 Category Intent

Applicant companies are committed to upholding human rights and applying fair and equitable business practices.

8.2 Requirements Summary

To achieve a desired level within the category, the requirements at all lower levels must also be met.

Bronze	Human rights risks are assessed for the applicant company, final manufacturing stage, and direct suppliers to the final manufacturing stage (tier 1). Progress is made on assessing risks beyond tier 1 (i.e. tier 2 and beyond).
	A human rights policy based on international human rights standards and an understanding of the company's risk areas is in place, and a strategy for implementing the policy has been developed.
	For the applicant company and final manufacturing stage facilities, performance against the human rights policy is measured and corrective actions for select issues (e.g. child labor, forced labor) are complete. Corrective actions are planned for any other poor performance issues and at recertification, progress is demonstrated.
	Company executives demonstrate commitment and support for establishing, promoting, maintaining, and improving a culture of social fairness.
Silver	Social audit performance data are requested from tier 1 suppliers in high-risk locations. At recertification, progress is made on supply chain data collection and corrective actions if needed.
	Performance data are analyzed to measure progress towards achieving the strategy.
	Management systems support the implementation and oversight of the human rights policy within company operations.
	A grievance mechanism permits company employees and other stakeholders to obtain redress for negative human rights impacts.

	The company has implemented a positive social impact project that measurably improves the lives of employees, the local community, or a social aspect of the value chain.
Gold	Human rights risks are assessed for the product's components and raw materials (regardless of tier).
	Materials associated with high-risk of child or forced labor or support of conflict are certified to a C2CPII recognized certification program or an equivalent alternative is in place. If a certification program is not available, a traceability exercise is conducted upon recertification.
	Responsible sourcing management systems support the implementation and oversight of the policy within the product's supply chain.
	A grievance mechanism permits contract manufacturer employees and other stakeholders to obtain redress for negative human rights impacts.
	An assessment has been conducted to determine the impact of the positive impact project using quantitative metric(s). Measurable progress is demonstrated at recertification.
	The company uses open and transparent governance and reporting that incorporates stakeholder engagement. Stakeholder feedback informs strategy and operations.
Platinum	The company is collaborating to develop and scale solutions to an intractable social issue within the value chain of the product.
	The company fosters a diverse, inclusive, and engaged work environment in which social fairness operates as a core part of recruitment, training, remuneration, performance evaluation, and incentive structures.

8.3 Assessing Risks & Opportunities

Intended Outcome(s)

Opportunities for improvement are identified and understood as a result of an assessment of human rights risks.

Applicable Achievement Level(s)

Bronze and Gold

Requirement(s)

Bronze level:

- Assess human rights risks and identify opportunities for improvement for the applicant company, including all final manufacturing stage facilities, and tier 1 suppliers. (Note: Tier 1 suppliers are defined as suppliers to the final manufacturing stage, including in cases where the applicant is using contract manufacturing.)
- Demonstrate ongoing efforts to improve visibility and assess risks within the certified product's supply chain (i.e. beyond tier 1).

Gold level: Assess human rights risks and identify opportunities for improvement associated with the product's components and raw materials (regardless of supply chain tier).

For the Bronze level, the risk and opportunity assessment must include:

1. A company level risk assessment based on conducting desk research, at a minimum, to identify:
 - a. Known and likely human rights risks associated with the applicant company's own operations, final manufacturing stage facilities, the product's supply chain, product cycling, relevant communities, potentially affected groups, and other relevant stakeholders
 - b. Well known risks associated with the applicant's industry/sector and country(ies) of operation.
2. A tier 1 supplier risk assessment based on knowledge of supplier industry/sector and locations to identify: high-risk supplier facilities including those in:
 - a. Industries/sectors associated with a high-risk of human rights violations or other negative human rights impacts,
 - b. Locations that are reputed to have conflict, corruption, widespread human rights violations, and/or weak governance.
 - c. De facto high-risk locations, defined as countries that fall below the 65% percentile when taking an average of the six World Bank Worldwide Governance Indicators.
3. Identification of human rights due diligence best practices to address the risks.
4. Information regarding the impact and importance of identified risks as defined by affected stakeholders, including employees of the applicant company.
5. Prioritization of the risks and opportunities for improvement identified. At a minimum, the following must be prioritized:
 - a. Well-known industry risks,
 - b. Human rights violations, and
 - c. Issues where the applicant has substantial leverage to make improvements.

6. Testing the results of the assessment with internal audience(s) to validate the outcome.

Ongoing efforts to improve visibility and assess risks within the product's supply chain based on increasing knowledge of tier 2 (and eventually beyond tier 2) supplier industry/sector(s) and location(s) as described in #2 above for tier 1 must be demonstrated. If new risks are identified, #3-6 above also apply. For supplier locations that have not yet been identified, if there is a chance that the location is high-risk, then it must be considered de facto high-risk until shown otherwise. Identification of the locations of these potentially high-risk suppliers must be prioritized.

For the Gold level, high-risk components and raw materials must be identified, including the following de facto high risk items:

1. Materials and components from source countries where there is reason to believe that child labor or forced labor is involved, and
2. Tin, tantalum, tungsten, and gold from conflict-affected and high-risk areas.

If new risks are identified, #3-6 above also apply.

8.4 Human Rights Policy

Intended Outcome(s)

The applicant is formally committed to respecting and upholding human rights as defined by international standards.

Applicable Achievement Level(s)

Bronze

Requirement(s)

Commit to respect human rights, as enshrined in municipal law and internationally recognized human rights standards, through company policy.

The policy must:

1. Establish human rights expectations for the applicant company, the supply chain, communities, potentially affected groups, and other relevant stakeholders.
2. Include the company's commitment to support the following (note: these are the expectations that must be established and are referred to as 'required policy elements' in other sections of the standard):

- a. Elimination of discrimination with respect to employment and occupation including but not limited to ethnicity-, race- and gender-based discrimination,
 - b. Elimination of harassment and abuse,
 - c. Elimination of all forms of forced or compulsory labor, or activities that are known to lead to forced labor (e.g. human trafficking),
 - d. The abolition of child labor and adequate protections for workers above the legal working age and below age 18,
 - e. Prevention of excessive working hours,
 - f. Freedom of association and collective bargaining,
 - g. Safe and healthy work, including:
 - i. Access to water, sanitation, and hygiene (WASH),
 - ii. Emergency preparation and response,
 - iii. Hazardous materials handling procedures,
 - iv. Management systems that address health and safety risks, and
 - v. Appropriate building construction, electrical, and fire safety.
 - h. Provision of the legal minimum wage and all legally mandated benefits including employer contributions for social security benefits and services,
 - i. Aspirations for the provision of a living wage that covers the necessities for life as defined in its local context (e.g., food, water, housing, health care, education, clothing, transportation, child care, discretionary income).
 - j. Additional priority issues identified in the risk assessment (per Section 8.3), if any.
3. Be formally approved and signed by a duly empowered officer of the applicant company or by the board of directors.

The policy must be guided by the eight Fundamental Conventions of the International Labor Organization and the United Nations Guiding Principles on Business and Human Rights, as well as the International Bill of Human Rights. Where national law and these international human rights standards differ, the applicant must follow the higher standard; where they are in conflict, the applicant must seek to respect internationally-recognized human rights to the greatest extent possible.

8.5 Monitor and Verify Performance

Intended Outcome(s)

Performance on upholding human rights is monitored and verified, ensuring that corrective actions are taken when poor performance is identified and increasing the level of assurance that risks to human rights are addressed.

Applicable Achievement Level(s)

Bronze, Silver, and Gold

Requirement(s)

Bronze level: For the applicant company and final manufacturing stage facilities, measure performance against the human rights policy and confirm the completion of corrective actions associated with issues of high concern including child labor, forced labor, corruption/bribery, and immediate threats to life and safety. For any other poor performance issues, plan corrective actions and at recertification, demonstrate progress on addressing the issues.

Silver level: Request data measuring performance against the human rights policy from all high-risk tier 1 suppliers. At recertification, demonstrate continued efforts to obtain performance data and evidence of tracking corrective actions that may be necessary at tier 1 supplier locations.

Gold level: For components and raw materials associated with high-risk of child labor, forced labor, or support of conflict, specify or certify to a C2CPII-recognized certification (if available) or equivalent that includes performance requirements aligned with the human rights policy.

For the Bronze level, performance measurement requirements applying to the applicant company and final manufacturing stage facilities:

1. Performance data must be generated and verified by a qualified party.
2. If identified, the following issues of high concern must be resolved prior to certification or recertification
 - a. Child labor,
 - b. Forced labor,
 - c. Corruption/bribery,
 - d. Unauthorized subcontracting,
 - e. Missing or deficient permits (i.e. business license, building permit, and environmental permit(s) if required by local regulations),
 - f. Any immediate threat to life or safety (e.g. poor fire safety, structural safety hazard), and
 - g. Denial of access to the facility, workers, or files.

For the Silver level:

1. Social audit performance data must be requested from all high-risk tier 1 suppliers, including de facto high-risk suppliers (as defined in Section 8.3).
2. If data are outdated or not available, the applicant must arrange for a social audit to be conducted.

3. Audits must be performed by qualified personnel with a social audit credential and no conflicts of interest related to the supplier.
4. Data must be generated within the past 24 months.
5. If identified, the following issues of high concern must be resolved prior to certification or recertification,
 - a. Child labor,
 - b. Forced labor,
 - c. Corruption/bribery,
 - d. Unauthorized subcontracting,
 - e. Missing or deficient permits (i.e. business license, building permit, and environmental permit(s) if required by local regulations),
 - f. Any immediate threat to life or safety (e.g. poor fire safety, structural safety hazard), and
 - g. Denial of access to the facility, workers, or files.
6. Corrective actions must be planned or ongoing for any other poor performance issues identified. At recertification, the applicant must demonstrate progress on:
 - a. Encouraging suppliers to complete corrective actions,
 - b. Tracking whether timelines are adhered to, and
 - c. Taking steps to suspend or terminate relationships with suppliers that fail to make progress on remediation.
7. At recertification, progress must be demonstrated on requesting social audit data from additional high-risk suppliers, if any, identified through the supplier risk assessment. For suppliers that continually fail to provide data, the applicant must take remedial actions (i.e. steps to suspend or terminate the relationship) after a maximum of two years.

For the Gold level:

1. A C2CPH-recognized certification or an equivalent alternative to certification is required for all de-facto high-risk components and raw materials subject to review (as defined for Material Health), if a C2CPH-recognized certification exists.
2. At recertification, if a C2CPH-recognized certification does not exist and the applicant has not been able to institute an alternative, the applicant must:
 - a. Undertake a traceability exercise with the goal of tracking the material from the direct supplier through all stages of processing to initial production or extraction,
 - b. Establish how to mitigate the negative human rights impacts, and
 - c. Participate in a stakeholder initiative actively working to address the issues.

8.6 Strategy for Policy Implementation

Intended Outcome(s)

A framework for monitoring and measuring progress towards achievement of social performance targets and for identifying areas for improvement is established.

Applicable Achievement Level(s)

Bronze and Silver

Requirement(s)

Bronze level: Develop a strategy for implementing the human rights policy and report on implementation progress at each recertification.

Silver Level: Analyze performance data to measure progress towards achieving social targets and objectives, and identify areas for improvement.

For the Bronze level, the strategy must:

1. Address priority risks and opportunities (per Section 8.3).
2. Include specific time-bound performance and impact objectives to guide decision-making.
3. Define the scope of implementation.
4. Define the company's human, technical, and material resource allocation for implementation.

For the Silver level, performance data must be analyzed every two years. For any areas of poor performance identified, methods of improving outcomes must be identified and evaluated, and the strategy refined accordingly.

8.7 Demonstrating Commitment

Intended Outcome(s)

A culture of social fairness that prioritizes human rights and the application of responsible business practices to all stakeholders is established, promoted, and improved by company leadership.

Applicable Achievement Level(s)

Bronze

Requirement(s)

Demonstrate commitment and support for establishing and maintaining a culture whereby employees and business partners are able to achieve high levels of social performance.

The applicant's leadership team (i.e. C-level executive and/or Board of Directors) must demonstrate commitment and support by:

1. Communicating the company's social aspirations and values, strategy for upholding human rights, and significance of respect for human rights to the success of the company internally and/or externally.
2. Defining a position to actively lead on human rights, oversee implementation of the strategy, and drive continuous improvement efforts.
3. Ensuring there are defined procedures for escalating human rights risks and identified impacts to the executive team.

8.8 Management Systems

Intended Outcome(s)

A management system for people and procedures is in place, ensuring that necessary corrective actions are taken, actions are effective, and that performance on protecting human rights is ultimately improved.

Applicable Achievement Level(s)

Silver and Gold

Requirement(s)

Silver level: Implement a management system that supports achievement of the human rights policy commitments within company operations.

Gold level: Implement a responsible sourcing management system that supports achievement of the human rights policy commitments within the product's supply chain.

For the Silver level, the management system must include the following elements:

1. Designated staff with social compliance responsibilities.
2. Designated oversight function and process.

3. Business procedures that support implementation of the human rights policy within the company's workplace and across corporate functions and different levels of management.
4. Education for staff with social-related duties on human rights principles.
5. Internal communication and employee involvement.
6. Procedures to measure and evaluate workplace activities against the human rights policy.
7. Policies and procedures for the prompt implementation of corrective and preventive actions within the company's workforce.

For the Gold level, the responsible sourcing management system must include the following elements:

1. Designated staff with ethical sourcing responsibilities.
2. Designated oversight function and process.
3. Procedures to communicate to suppliers the company's human rights policy and any associated ethical sourcing business processes.
4. Supplier contractual requirements for human rights policy compliance and monitoring (e.g. supplier codes of conduct if defined as a contractual term). Contracts must require suppliers to extend social compliance expectations to their suppliers.
5. Evaluation of new suppliers prior to the awarding of contracts to determine if the supplier can meet requirements.
6. Policies and procedures for the prompt implementation of corrective and preventive actions.
7. Education for sourcing and/or procurement team(s) on responsible sourcing and/or human rights principles.
8. Business procedures for identifying and documenting the cause and resolution of human rights issues and/or impacts in the supply chain that arise as a result of audits/reviews or concerns raised by employees or other third parties.

For recertification at the Silver or Gold level, the policy, procedures, practices and/or programs must be reviewed to identify deficiencies and implement changes (if needed) that will lead to improved performance. Remedial activities (if needed) must be underway and seek to identify and address root causes. (Note: this applies to the company-level management system at the Silver level and also to the responsible sourcing management system at the Gold level.)

8.9 Grievance Mechanisms

Intended Outcome(s)

A mechanism is in place by which employees, customers, suppliers, and other stakeholders may safely report negative effects of business activities and operations and other social fairness concerns to the company in order to obtain redress for those impacts.

Applicable Achievement Level(s)

Silver and Gold

Requirement(s)

Silver level: Provide a grievance mechanism that permits company employees and other stakeholders to obtain redress for negative human rights impacts. For any contract final manufacturing stage facilities, request that a grievance mechanism be made available.

Gold level: For contract final manufacturing stage facilities, ensure that a grievance mechanism is available that permits employees and other stakeholders to obtain redress for negative human rights impacts.

For the Silver and Gold levels, the applicant company must have a grievance mechanism for company employees and other stakeholders that:

1. Is supported by a non-retaliation policy.
2. Is capable of addressing the risks and potential adverse impacts on people.
3. Addresses concerns promptly, using an understandable and transparent process based on local best practices that is readily accessible by any affected stakeholder.
4. Provides feedback to those concerned, without their risking retribution.
5. Includes informing direct employees about the mechanism at the time of hire.
6. Does not impede or preclude access to judicial or administrative remedies that might be available under law or through existing arbitration procedures, or substitute for grievance mechanisms provided through collective agreements.
7. Includes written records and periodic reviews to identify and make necessary improvements.

For the Gold level, the grievance mechanism may be provided by the contract manufacturer or by the applicant.

8.10 Positive Impact Project

Intended Outcome(s)

Positive impact on a social issue of significant importance to the company and/or value chain of the product.

Applicable Achievement Level(s)

Silver and Gold

Requirement(s)

Silver Level: Implement a positive impact project that measurably improves the lives of employees, the local community, or a social aspect within the value chain of the product.

Gold level: Conduct an assessment to determine the impact of the positive impact project using quantitative metric(s).

For the Silver level, the following are required:

1. The applicant must invest in a social impact project that involves issues or opportunities that were identified in the risk assessment process (per Section 8.3) or that are otherwise material to the company.
2. The project goal(s) must be supported by one or more key performance indicators that are tracked before, during, and after the project.
3. Project selection must incorporate employee input.

For the Gold level, an impact assessment must be performed based on the defined key performance indicator(s). For recertification, measurable progress must be demonstrated.

8.11 Transparency & Stakeholder Engagement

Intended Outcome(s)

The applicant company is held accountable for any negative human rights impacts, encouraging ever improving performance.

Applicable Achievement Level(s)

Gold

Requirement(s)

Use open and transparent governance and reporting, incorporating stakeholder engagement and feedback to shape strategy and operations.

The applicant must make the following information available to stakeholders:

1. The human rights policy, objectives, progress towards achieving objectives, and a description of impacts.

2. Sourcing information including number of suppliers by geographic location. Required for the final manufacturing stage, direct suppliers to the final manufacturing stage, and high-risk components and raw materials (per Section 8.3).

The applicant must have a robust process for accepting or soliciting, and responding to, stakeholder feedback. Input from stakeholders must be regularly obtained and used to shape the strategy for implementing the human rights policy, management systems, and related operations.

8.12 Collaborating to Solve Social Issues

Intended Outcome(s)

Industry-wide progress is made towards solving social issues that are widely recognized as being difficult and complex.

Applicable Achievement Level(s)

Platinum

Requirement(s)

Collaborate to develop and scale solutions to an intractable social issue within the value chain of the product.

Collaboration must be with a multi-stakeholder program or consortium working on a common goal to comprehensively address a social issue. The applicant must actively participate for the full certification period. The initiative selected must:

1. Support implementation of the company's social strategy and policy.
2. Aim to drive progress within an industry or across multiple industries.
3. Ensure that ground rules for the partnership allow for adequate voice for all participants.
4. Include ongoing assessment of partnership impact.

8.13 Fostering a Culture of Social Fairness

Intended Outcome(s)

Socially fair business practices in its governance and management approach are applied by the applicant company. This is reflected by a diverse, inclusive, and engaged workforce and through training, remuneration, and payment of a living wage.

Applicable Achievement Level(s)

Platinum

Requirement(s)

Foster a diverse, inclusive, and engaged work environment in which social fairness operates as a core part of recruitment, training, remuneration, performance evaluation, and incentive structures.

The following are required:

1. New employee and executive selection and hiring processes must consistently include an evaluation of whether the applicant shares the company's social values.
2. Hiring and promotion processes must be evaluated and amended, if needed, to ensure diversity and inclusion.
3. Access to training on key social issues must be provided to all executives and employees.
4. Awareness training must be provided to all staff, including information on, human rights, diversity and inclusion, gender equality, and anti-discrimination.
5. Social performance metrics must include ethnicity-, race-, sex- and age-disaggregated indicators on hiring, compensation, promotion, demotion, training and mentoring for employees of all levels.
6. Data must be collected to evaluate pay equity. The evaluation must include a comparison of the average wages by ethnicity, race, and gender for work of equal value, and the ratio of the compensation of the CEO or equivalent to the median and average wage of a full-time worker.
7. Pay equity data must be published externally and made publicly accessible. An explanation of differences that may be realized or quantified over time must be included.
8. Data on gender-based violence in the workplace must be documented where it has occurred.
9. Performance assessments of any executives or employees with designated social responsibilities must include consideration of criteria or metrics derived from the human rights policy and strategy.
 - a. Social performance results must be considered in compensation packages / incentive plans for top company executives and management with social management or oversight functions (i.e., from C-level executives to business unit and functional heads).
10. Diversity and equal opportunity employment must be included in the organization's social strategy and implementation. The company must:
 - a. Conduct an evaluation to understand why ethnicity, race, and gender differences exist in the boardroom, the workplace, and the first tier of the supply chain and put in place a remedial plan.
 - b. Develop and implement a plan for remedying any differences, if they exist.

- c. Investigate, encourage, and promote equal opportunities for women and racial, ethnic, religious, or economically disadvantaged minorities into supervisory and management roles in the workplace, particularly if they are under-represented in such roles.
- 11. Employees are paid a living wage. This is defined as being paid sufficiently for a standard workweek (i.e. not including overtime) to afford a decent standard of living for their families, inclusive of: food, water, housing, education, health care, transportation, clothing, and other essential needs including savings for unexpected events and some disposable income.
- 12. Program(s) must be implemented to regularly engage employees (including other workers on the premises or under the supervision of the company) on the company's social vision and goals, and to identify actions that will help the company to achieve them.

9 // PACKAGING FOR CERTIFIED PRODUCTS

9.1 Product Packaging Requirement Options

At a minimum, the packaging for products seeking certification is subject to the requirements listed in Section 9.2 below. However, an applicant is encouraged to optionally include packaging in the product certification in one of the following ways:

1. Product packaging may be certified as a separate product. In this case, the product must meet all standard requirements, the same as other products. In addition, if the packaging seeking certification as a separate product contains plastic materials, it needs to meet the requirements in section 10.1.
2. Product packaging may be considered a part of the product and is thus included in the product certification. In this case, the packaging materials will be considered as additional homogeneous materials in the product, with all of the product's materials subject to all standard requirements, the same as other products.
3. Product packaging may be assessed separately from the product in the Material Health and Product Circularity categories only. In this case, the achievement levels for these two categories are assigned to the packaging separately, then are separately stated on the product's certificate and in the Cradle to Cradle Certified Product Registry. If this option is selected, the packaging is not subject to the Clean Air & Climate Protection, Water & Soil Stewardship, or Social Fairness requirements.

9.2 Product Packaging Requirements

Note: The requirements in this section apply to the packaging of a product seeking certification.

Intended Outcome(s)

Product packaging meets high product circularity standards at the entry level of certification, ensuring alignment with the Cradle to Cradle principles for these typically non-circular and environmentally damaging product types.

Applicable Achievement Level(s)

Bronze

Requirement(s)

For product packaging, design the packaging for cycling, incorporate cycled content, and ensure access to cycling.

The following are required:

1. The primary packaging materials for formulated consumer products that are fast-moving consumer goods, including cosmetics, personal care, and household and industrial/institutional cleaning products, and for any product, packaging materials that are intended to be used with the product or for the application or dispensing of the product (e.g. mascara brush, lipstick tube, or other types of applicators, paper towel or toilet paper cores, tape dispenser, glue stick), must comply with:
 - a. The RSL (Section 4.3),
 - b. The organohalogen restriction (Section 4.4),
AND two of the following from c, d, e, and f below:
 - c. The sum of post-consumer cycled and renewable content must be $\geq 20\%$. An exception is for compostable plastics, which must contain only some ($> 0\%$) renewable content;
 - d. The packaging materials meet all cycling requirements below:
 - i. The packaging must be compatible for municipal cycling systems.
 - ii. Plastic materials must be a type that is commonly recycled or composted via curbside pick-up (i.e., PET, HDPE, PP, bioplastics) and the material must be accepted by municipal recycling programs in the region(s) where the product is sold,
 - iii. Materials that are intended for composting must be fully compostable per a C2CPH-recognized compostability standard consistent with the intended cycling pathway(s), and
 - iv. Materials that are commonly recyclable (e.g. paper, steel and/or aluminum) must not contain additives or features that are likely to result in low-value (i.e. low-quality) reprocessed material. Additives that may be present in the recycled content used are out of scope for this determination. Exemption: Glass is exempt from this requirement.
 - e. The packaging is refillable and/or the packaging has a product-specific take-back program.
 - f. The applicant has demonstrated efforts to reduce the amount or weight of the packaging materials for the certified product.
2. Any other packaging materials contained in one sales unit as it is offered to the end user or consumer at the point of purchase and not added exclusively for shipping (e.g. a toothpaste box, outer box containing individually wrapped product units), must comply with:
 - a. The organohalogen restriction (section 4.4),
AND one of the following from b, c, d, and e below:
 - b. The sum of post-consumer cycled and renewable content must be $\geq 20\%$. An exception is for compostable plastics, which must contain only some ($> 0\%$) renewable content;

- c. The packaging materials meet all cycling requirements below:
 - i. The packaging must be compatible for municipal cycling systems.
 - ii. Plastic materials must be a type that is commonly recycled or composted via curbside pick-up (i.e., PET, HDPE, PP, bioplastics) and the material must be accepted by municipal recycling programs in the region(s) where the product is sold,
 - iii. Materials that are intended for composting must be fully compostable per a C2CPH-recognized compostability standard consistent with the intended cycling pathway(s), and
 - iv. Materials that are commonly recyclable (e.g. paper, steel and/or aluminum) must not contain additives or features that are likely to result in low-value (i.e. low-quality) reprocessed material. Additives that may be present in the recycled content used are out of scope for this determination. Exemption: Glass is exempt from this requirement.
- d. The packaging is refillable and/or the packaging has a product-specific take-back program
- e. The applicant has demonstrated efforts to reduce the amount or weight of the packaging materials for the certified product.

The following materials are not subject to the packaging requirements:

1. Materials used exclusively for shipping the product, such as a box, pallet, or shrink/plastic wrap, that are not the primary packaging materials that contain, envelop, or hold the product.
2. Packaging materials for products that are sold exclusively as material inputs for other products (rather than being sold to the general public).

10 // PRODUCT AND MATERIAL TYPE-SPECIFIC REQUIREMENTS

10.1 Plastic Packaging Products (Certified as Separate Products)

Plastic packaging products must meet the requirements in this section at the Bronze level, in addition to all other requirements in the standard for the desired achievement level (Sections 3-8).

Intended Outcome(s)

Plastic packaging products meet high product circularity standards at the entry level of certification, ensuring alignment with the Cradle to Cradle principles for these typically non-circular and environmentally damaging product types.

Applicable Achievement Level(s)

Bronze

Requirement(s)

For plastic packaging products, design the product for cycling, ensure access to cycling, and incorporate cycled content.

All of the following are required:

1. Plastic packaging must be intentionally designed for reuse/refilling through refill products/services offered by the applicant or partner organizations. Exemption: Eligible food wrappings and food waste bags are exempt from this requirement.
2. Any product contained in the packaging as sold must be certified or in the process of certification.
3. The sum of post-consumer cycled and renewable content must be $\geq 20\%$ An exception is for compostable plastics, which must contain only some ($> 0\%$) renewable content.
4. The product and/or materials that are intended for technical cycles must be compatible with municipal cycling systems.
5. Plastic materials must be a type that is commonly recycled or composted via curbside pick-up (i.e., PET, HDPE, PP, bioplastics) and the material must be accepted by municipal recycling programs in the region(s) where the product is sold.
6. For products containing $\leq 50\%$ post-consumer cycled or renewable content, plastic materials/parts that are intended for technical cycles must not contain additives or features that make recycling unlikely or would likely result in low-value (i.e. low-quality) reprocessed

material (e.g. optical brighteners, mixed polymers). Additives that may be present in the recycled content used are out of scope for this determination.

7. Materials that are intended for composting must be fully compostable per a C2CPH-recognized compostability standard consistent with the intended cycling pathway(s).

10.2 Animal Material

Several animal material types may not be used in certified products (per Section 2.2). The requirements in this section apply to animal materials and substances derived from animal materials that are eligible for certification. The eligible materials and substances to which the requirements in this section apply are:

1. *By-products of meat production and fishing (e.g. leather, sheepskin, down, fish skin - excluding fur), or*
2. *Material sourced from animals that do not have to be killed or live-plucked in order to harvest the material (e.g. sheep's wool).*

For substances derived from by-products (e.g. substances derived from fat, skin, bone): The requirements in this section apply only if these substances are inextricably tied to the product's core functionality (e.g. products made entirely from gelatin, collagen, chondroitin, squid ink, or tallow and products containing these substances if tied to core functionality.)

Note: These requirements do not apply to material from invertebrates for which clear evidence of sentience does not exist.

Intended Outcome(s)

The welfare of the animals is protected during all production phases when material from animals is used in a certified product.

Applicable Achievement Level(s)

Bronze and Silver

Requirement(s)

Bronze level: For products containing animal material, commit to protecting animal welfare through company policy. Develop a strategy and plan for implementing a mechanism that aims to ensure adherence to the policy and demonstrate progress towards implementing the policy and mechanism.

Silver level: Use materials and substances certified to a C2CPH-recognized animal welfare certification program, or equivalent alternative.

For the Bronze level, the applicant must have a policy in place that forbids animal abuse at all facilities where the animals are raised and/or slaughtered (including any facilities in the supply chain), and during transport. The policy must:

1. Address the five freedoms:
 - a. Freedom from hunger and thirst
 - b. Freedom from discomfort
 - c. Freedom from pain, injury, and disease
 - d. Freedom to express normal behavior
 - e. Freedom from fear and distress
2. Prohibit specific practices of high concern for the animal-derived material type in question (e.g. mulesing of sheep).
3. Include provisions to immediately address cases where it becomes known that animal abuse is occurring (e.g., a provision to immediately cease doing business with affected suppliers until the issue is resolved).

The planned mechanism for implementing the policy must include:

1. Regular on-site surveillance of all relevant facilities by individuals knowledgeable of animal health and welfare issues to verify implementation of the policy.
2. A method of tracking material from farm to certified product in any case where the farm is not the final manufacturing stage.

For the Silver level:

1. The animal welfare certification or alternative must address all required points of the policy (per the Bronze level requirements) and include regular site surveillance of all relevant facilities by third-party auditors knowledgeable of animal health and welfare issues. Regular site surveillance is defined as at least one on-site audit every two years including an allowance for conducting unannounced audits.
2. If using an equivalent alternative to certification, qualified third-party auditors without a conflict of interest (i.e. no other paid services provided to the applicant) must verify equivalency and policy implementation.

11 // PRIVATE LABEL PRODUCT REQUIREMENTS

A private label product is a product that is identical in every way to another product that is currently Cradle to Cradle Certified (i.e. the parent product), except for brand name and packaging.

Companies applying for a private label product certification must meet the following requirements:

1. Complete and sign a Private Label form stating that the product is identical to the certified parent product.
2. If necessary for the achievement level in the Product Circularity category met by the parent product, make a connection to the original equipment manufacturer's or parent product company's take-back program(s) or other cycling initiatives in order for the product to be cycled as intended, and
3. Unless meeting all standard requirements per the option below, disclose that the certification is a private label certification. (C2CPH will indicate which certifications are private label product certifications on the Cradle to Cradle Certified Product Registry and on Cradle to Cradle Certified certificates.)

All other program requirements will have been met by the parent product company rather than by the private label company.

If a company does not wish to disclose that the product has a private label certification, the product and company must meet all standard requirements (although the majority will have already been met by the manufacturer and parent company). This will include:

- The company-level Social Fairness requirements, and
- The company-level Environmental Policy and Management requirements unless already met by the final manufacturing stage

For further information about private label certifications, see the Policy for Certification of Private Label Products within the Cradle to Cradle Certified™ Certification Scheme.

12 // DEFINITIONS

Anaerobic digestion – The process by which microorganisms biologically decompose material into carbon dioxide, methane, water, inorganic compounds, and/or biomass in an anaerobic environment (absence of oxygen), within a limited time period.

Baseline water stress - Baseline water stress measures the ratio of total water withdrawals to available renewable surface and groundwater supplies. Water withdrawals include domestic, industrial, irrigation, and livestock consumptive and non-consumptive uses. Available renewable water supplies include the impact of upstream consumptive water users and large dams on downstream water availability. Higher values indicate more competition among users. - WRI Aqueduct, 2019

Benign minerals – Inorganic salts that contain cations and anions that are considered compatible with or beneficial to biological life processes.

Biodegradable material – A material that can undergo near-complete biological decomposition into carbon dioxide, water, inorganic compounds, and biomass in a natural medium (soil, water, or anaerobic environments) within a limited time period thereby efficiently returning nutrients from the material back to the earth.

Bioenergy credit multiplier – A unitless factor used to calculate the bioenergy credit. The bioenergy credit multiplier is equal to: $[1 - (\text{adjusted Biogenic Assessment Factor for the eligible fuel})]$.

Biogenic assessment factor – A unitless factor that represents the net atmospheric biogenic CO₂ contribution associated with using a biogenic feedstock at a stationary source, taking into consideration biogenic landscape and process attributes associated with feedstock production, processing, and use at a stationary source, relative to the amount of biogenic feedstock consumed. This term represents a ratio of the net biogenic carbon cycle effects from all stages of the growth, harvest/collection, processing, and use of a biogenic feedstock relative to the carbon content of biogenic feedstock used at the point of assessment and resulting in stack emissions at a stationary source. [Reference: U.S. Environmental Protection Agency, Office of Air and Radiation, Office of Atmospheric Programs, Climate Change Division. Framework for Assessing Biogenic CO₂ Emissions from Stationary Sources, November 2014] BAFs modeled using future anticipated baselines developed for fuels most similar to those eligible for credit per the standard were selected. The BAFs were adjusted up by 10% as a conservative approach, or in the case of landfill gas and similar, set to zero rather than giving a credit greater than the carbon dioxide emissions produced.

Biological cycle – The cycle by which materials or parts are released to, and ideally reprocessed in, the environment via composting, biodegradation, nutrient extraction, or other biological metabolic pathways.

Biologically-derived material – A material that is a biological material or that was originally derived from a biological material through one or multiple chemical transformations.

Biological material – A material that is extracted from a plant or animal source without significant chemical processing.

Chemical substance (“Substance”) – Matter of constant composition best characterized by the entities (molecules, formula units, atoms) it is composed of. Physical properties such as density, refractive index, electric conductivity, melting point, etc. characterize the chemical substance.

Component (“Part”) – A single functional grouping of contents. A part is an optional categorization to identify a portion of a product that is used modularly. A part will still be comprised of one or more homogeneous materials.

Compostable material – A material that can undergo near-complete biological decomposition into carbon dioxide, water, inorganic compounds, and biomass in an industrial composting facility within a limited time period.

Cycling – The processing of material, parts, or whole products toward a new use cycle via a technical or biological cycling pathway that includes at least one of the following: reuse, remanufacturing, refurbishing, recycling, nutrient extraction/anaerobic digestion, composting, or biodegradation.

Cycled content – Material or parts that have been reclaimed, recycled, salvaged, or otherwise captured from a pre-consumer or post-use phase of a previous cycle.

Cycling pathway – A specific method, system, or other means of processing a material at the end of its use phase. Examples include: municipal recycling, home composting, aerobic biodegradation in wastewater (i.e. at municipal treatment plant), take-back and repair/remanufacture by the manufacturer.

Destructive disassembly operations - Disassembly processes that deal with the partial or complete destruction of obstructing components. In these cases, components or irreversible fasteners, e.g. welds, are destroyed using destructive tools such as a hammer, crowbar, or grinder.

Direct discharge – Effluent is discharged to surface or groundwater instead of to an externally owned and operated wastewater/effluent treatment facility.

Fast-moving consumer goods – Non-durable consumer products that are purchased frequently, consumed rapidly, and sold quickly at a relatively low cost. Examples include household goods such as cosmetics, personal care, and cleaning products, and office supplies.

Final manufacturing stage – The processes that constitute the final manufacturing stage are defined by industry category in the *C2CPII Methodology for Applying the Final Manufacturing Stage Requirements*.

Final manufacturing stage facility – A facility at which final manufacturing stage processes occur. Final manufacturing stage processes are defined in the *Methodology for Applying the Final Manufacturing Stage Requirements*.

Formulated consumer product – A product whose function is determined primarily by its chemical composition (rather than shape, surface, or physical design). Typically, it is a single homogeneous chemical mixture such as a liquid, gel, paste, cream, powder, tablet, or bar.

High-value cycling – The cycling of high-quality materials as defined by the Gold level requirements for ‘high-value cycling potential’ in Section 5.7.

Homogeneous material (“Material”) – A material of uniform composition throughout that cannot be mechanically disjointed, in principle, into different materials. Coatings and finishes such as plating, powder coats, enamels, etc. are considered unique homogenous materials (see Cradle to Cradle Certified Methodology for Defining Homogeneous Materials for details).

Intended cycling pathway – See ‘Cycling pathway’.

Intermediate product – A product sold exclusively as an input to be used in another product and not sold to the general public.

Key material – A material that is typically manufactured using pollutant intense or high-volume water use processes (see the *C2CPII Water Stewardship - Key Materials* reference document).

Long use-phase product – A product with a use-phase time that is typically greater than 1 year.

Material – See ‘Homogeneous material’.

Nutrient extraction – Applying biomass conversion processes and equipment to produce low-volume but high-value chemical products.

Rare and endangered species – Any species listed in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) appendices [Reference: <https://www.cites.org/eng/app/index.php>] and/or in the International Union for Conservation of Nature (IUCN) Red List as Near Threatened, Vulnerable, or Endangered. [<http://www.iucnredlist.org/>]

Performance improvement – In the context of energy conservation and efficiency projects, this term refers to the percentage change in energy consumption from a baseline period to a reporting period. Depending on the methodology employed, one or both of these values will be adjusted (i.e. normalized) to account for differences in production, weather, etc. between the baseline and

reporting period. This adjustment allows for a comparison of two consumption amounts that correspond to consistent conditions. Note that performance improvements do not necessarily correspond with or lead to total energy use reductions, particularly if production has greatly increased.

Pharmaceutical – A compound manufactured for use as a medicinal drug. This includes any substance or combination of substances presented as having properties for treating or preventing disease; or any substance or combination of substances that may be used in or administered to human beings and/or animals either with a view to restoring, correcting, or modifying physiological functions by exerting a pharmacological, immunological, or metabolic action, or to making a medical diagnosis.

Post-consumer cycled content – Material or parts that have been reclaimed, recycled, salvaged, or otherwise captured from households or commercial, industrial, or institutional facilities after fulfilling their use-phase time in a product.

Pre-consumer cycled content – Material or parts diverted from the waste stream during a manufacturing process. Material or parts such as rework, regrind, or scrap that are generated in a process and are capable of being reclaimed within the same process that generated it are excluded.

Primary packaging materials – The materials that physically contain, envelop, or hold the certified product, and typically come into direct contact with the product. Any materials or components that are attached to the materials that physically contain, envelop, or hold the certified product (such as inks, adhesives, labels, nozzles, pumps, and caps) are also considered to be part of the primary packaging.

Process chemical – Any substance that comes into direct contact with the product or any of its material constituents during any of the processes that constitute the final manufacturing stage of the product. It is used as an intentional part of any of these processes to fulfill a specific function or achieve a specific effect in the product or any of its material constituents. Within this definition, process chemicals are limited to pure chemical substances and chemical substances present in a mixture at a concentration of 1,000 ppm or above. Mixtures include liquids, sprays, gases, aerosols, solids, etc. The concentration threshold applies to process mixtures directly as received by the supplier and prior to any dilution that may take place at the manufacturing site. This definition does not include maintenance agents for machinery, effluent, or wastewater treatment chemicals, chemicals used in steam boilers, or cleaning agents used for the production area, offices, and/or lavatories. Distilled water, tap water, and ambient air in their unaltered state are excluded from the assessment.

Product – A physical item that can be routinely and individually purchased from the applicant by other entities. A product is composed of one or more components, homogeneous materials, and/or chemical substances. A product may function as a component or material in another product.

Product use-phase time – The typical time of use of a product starting at the point the product is received by the user or customer, and ending at the time the product is cycled (this includes refurbishment, remanufacturing, reuse, and recycling, but not repair).

Rapidly renewable – Material derived from a natural resource (agriculture or animal-derived) that has a maximum 10-year regeneration cycle. (Note: this term is used in the Renewable Energy & Climate category while the term “renewable” is used in the Product Circularity category).

Recycling – The process by which a material, after serving its intended function, is processed into a new material via mechanical or chemical transformation and then added to a new material formulation in a different context.

Refurbishing – The process of returning a product to good working condition by replacing or repairing major components that are faulty or close to failure, and making cosmetic changes to update the appearance of a product, such as cleaning, changing fabric, painting, or refinishing.

Remanufacturing – The process of disassembly and recovery at the subassembly or component level. Functioning, reusable parts are taken out of a used product and rebuilt into a new one. This process includes quality assurance and potential enhancements or changes to the components.

Renewable content – Material derived from a living, natural resource (agriculture, aquaculture, or animal-derived) that is legally harvested, as defined by exporting and receiving country. If the material is wood, or another material associated with extensive evidence of ecosystem destruction due to land conversion and/or poor management practices, to count as renewable the material must be certified by a C2CPH-recognized program as responsibly sourced. If the material is a biologically-derived plastic or liquid formulation, material only counts as renewable if its bio-based content has been quantified using radiocarbon dating and through chain of custody documentation showing derivation from natural resources.

Responsibly sourced renewable content – Material that is certified by a C2CPH-recognized standard that verifies sustainable, environmentally friendly forest or vegetation management. These recognized standards have criteria that address: 1) Compliance with all applicable laws and regulations of the country in which farming or harvesting operations occur, 2) Operations that respect land rights and land use rights, and are unlikely to cause displacement of food production, 3) Planning, monitoring, management, and continuous impact assessment for the farming and/or harvesting of material, 4) Maintenance, conservation, or enhancement of biodiversity in the forest/vegetation or other ecosystem, 5) Maintenance or enhancement of the productive function of the forest/vegetation or other ecosystem area and efficient use of harvested materials (e.g. rate of harvest does not exceed rate of re-growth in the long-term), 6) Maintenance or enhancement of the health and vitality of the forest/vegetation or other ecosystem and its protective systems (soil and water).

Reuse – The use of a product after its previous use-cycle, without any remedial action, in a different context than it was originally designed for.

Separable – The ability of removing one homogenous material from another one it is physically attached to.

Science-based targets – Targets adopted by companies to reduce greenhouse gas (GHG) emissions that are aligned with the level of decarbonization required to keep global temperature increase below 2 degrees Celsius compared to pre- industrial temperatures, as described in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR5). [Reference: sciencebasedtargets.org, accessed September 26, 2018]

Short use-phase product – A product with a use-phase time that is typically less than 1 year.

Single use plastic product – Any disposable plastic product that is designed to be used only once.

Stakeholder – An individual who may affect or be affected by an organization's activities. An affected stakeholder in the context of the Social Fairness requirements is an individual whose human rights have been affected by an enterprise's operations, products, or services.

Substance – See 'Chemical substance'.

Supply chain – A set of organizations linked by flow(s) of products, services, finances, or information from a source to a customer.

Technical cycle – The cycle by which a product's materials or parts are reprocessed for a new product use cycle via recycling, repair, refurbishment, remanufacturing, or re-use.

Tier 1 supplier – For the purposes of Cradle to Cradle certification, this term refers to direct suppliers to the final manufacturing stage of the product. For cases where the applicant company uses contract manufacturing, tier 1 suppliers are the suppliers of the contract manufacturer.

Value chain – Interlinked value-adding activities that convert inputs into outputs which, in turn, add to the bottom line and help create competitive advantage. A value chain typically consists of inbound distribution or logistics, manufacturing operations, outbound distribution or logistics, marketing and selling, and after-sales service. These activities are supported by purchasing or procurement, research and development, human resource development, and corporate infrastructure (Reference: Businessdictionary.com and <https://www.ifm.eng.cam.ac.uk/research/dstools/value-chain-/>).



**CRADLE TO CRADLE CERTIFIED™
PRODUCT STANDARD
VERSION 4**

SECOND DRAFT REFERENCE DOCUMENT

RESTRICTED SUBSTANCES LIST (RSL)

JULY 2020

(NOTE: This reference document will be updated prior to release of the Version 4 standard and annually thereafter.)

1. Background

The following restrictions apply to all products seeking Cradle to Cradle certification or a Material Health Certificate at any certification level under Version 4 of the Cradle to Cradle Certified Product Standard (the Standard). Unless noted otherwise, the applicable thresholds may not be exceeded for the listed restricted substances in any homogeneous material subject to review in a certified product.

The restrictions are grouped into a core list that applies to all homogeneous materials subject to review in all products, and five supplementary lists, which include additional restrictions specific to certain material or product types (see section 2). Some substances are on multiple lists with differing thresholds or restriction conditions. In such cases, the most conservative applicable restriction must be met (e.g. PAHs are restricted with different thresholds on the Biological Materials and the Children's Products Lists. For a biological material in a children's product, PAH concentrations must be below the more conservative thresholds on the Children's Product List).

With the exception of restrictions for certain classes of organohalogens on the core list (see 'Notes' below), the restrictions for substances on the RSL are based on leading international chemical regulations. The chemical regulations included are those currently in effect in the European Union (EU) under Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), Restriction of Hazardous Substances (RoHS), the Stockholm Convention, and the Toy Directive, as well as one threshold based on the European Council of Vinyl Manufacturers (ECVM) Industry Charter. Where a substance or substance group on this RSL is also on the list of Chemicals Known to the State to Cause Cancer or Reproductive Toxicity under California Proposition 65 ("The Safe Drinking Water and Toxic Enforcement Act of 1986"), this is referenced.

A number of the regulatory restrictions were generalized to apply to a broader set of materials or products than the original regulation addresses. Where restrictions from separate regulations overlapped, they were summarized to reflect the most general among the overlapping restrictions, both in terms of the restrictions' scope and the group of chemicals covered (e.g., all lead compounds versus just lead sulfates). Where multiple regulatory thresholds exist for the same substance and general application, the most conservative threshold was used.

To reflect additional restrictions that are added to the source regulations over time, the RSL will be updated prior to the completion of Version 4 and annually thereafter. With each revision of this reference document, current certification holders will be granted a transition period for their certified products to become certified under the newly released version.

Notes:

The RSL also includes restrictions on certain classes of organohalogens (see Section 4.4 in the Standard). Organohalogens are not currently restricted via a class-based approach in any international chemical regulations, but are included on the RSL to provide a complete list of substances that are restricted from use in any Cradle to Cradle Certified product.

In addition to the restrictions listed in this document, the program includes restrictions based on chemical class and toxicological assessment as specified in the Standard. Materials with > 1% carbon-bonded halogen content by weight, and recognized PBTs, vPvBs, EU CLP Cat.1 & 2 CMRs, and substances causing an equivalent level of concern are restricted at the Silver level and above. Furthermore, only substances that are assessed as compatible with human and environmental health following the Cradle to Cradle Certified Material Health Assessment Methodology are allowed in products at the Gold and Platinum levels.

2. Definitions and Scope of Restricted Substances Lists

Core List for All Materials in All Products- The restrictions on the core list apply to all homogeneous materials subject to review in a product seeking certification.

Biological Nutrient Materials- The restrictions on this list apply to BN materials subject to review in any product. For the purpose of this list, BN materials are those that fall under one or more of the following categories: (1) Materials released directly to biosphere as part of their intended use or end-of-use (liquid formulated products, aerosols, materials designed for composting or other biodegradation pathways, etc.), (2) Materials for which partial or complete release to environment is unavoidable as a part of use or end-of-use of the product (paint; materials designed to abrade: brake pads, shoe soles, sliders; etc.), (3) Biological materials (wood, agricultural products, etc.) or biologically-derived materials that are commonly regarded as compostable/biodegradable (i.e. paper, cellulose, etc.).

Children's Products- The restrictions on this list apply to all homogeneous materials subject to review in a children's product. A children's product is defined as any product that is marketed towards or intended *specifically* for use by infants or children.

Formulated Consumer Products- The restrictions on this list apply to any homogeneous material subject to review in a formulated consumer product. Formulated consumer products are defined as any chemical mixture (paint, detergent, nail polish, etc.) intended for supply to the general public and/or intended for diffusive applications such as in surface cleaning and cleaning of fabrics.

Textile Materials- The restrictions on this list apply to textile materials subject to review in any product. A textile is defined as a material that is composed of natural or synthetic fibers and is produced by weaving, knitting, tufting, or felting. This includes face fibers in carpet, upholstery, as well as apparel textiles.

Footwear, Apparel & Jewelry Products- The restrictions on this list apply to any homogeneous material subject to review in jewelry, apparel, footwear, clothing, or related accessories. They also apply to any textile material which, under normal or reasonably foreseeable conditions of use, comes into contact with human skin to an extent similar to clothing. Apparel and jewelry are defined as a product that clothes or adorns any part of the human body.

3. Legend

Restriction Source	Symbol or Indicator	Notes
REACH Annex XVII	REACH [number (8, 62b, etc.)]	Regulation (EC) No 1907/2006, Numbers correspond to entry in Annex XVII
REACH Annex XIV – Authorization list	REACH Auth [number (8, 62b, etc.)]	Regulation (EC) No 1907/2006, numbers correspond to entry in Annex XVI
Restriction of Hazardous Substances	RoHS	Directives 2002/95/EC, 2011/65/EU, 2015/863/EU
Persistent Organic Pollutants Banned by Stockholm Convention and/or EU Commission	POPs	EU Commission Regulations No 2019/1021
ECVM Industry Charter for the production of VCM and PVC	ECVM	Industry guidelines
EU Toy Safety Directive 2009/48/EC	9/48/EC	
California's Proposition 65 October 2017	Prop 65	Chemical or chemical group listed on the list of <i>Chemicals Known to the State to Cause Cancer or Reproductive Toxicity</i> . *NOTE: Prop 65 was not used to derive restrictions. It is only noted as a cross-reference for restricted substances that are also included on the Prop 65 list.

Max. allowable concentration (ppm)	Entry	Interpretation
Non-use (when written in the 'max. allowable concentration' column)	Non-use	Shall not be used as intentional input, treatment, or as part of process chemicals. Restricted to 1,000 ppm if present as an unintentional contaminant unless otherwise noted.

4. Core Restricted Substances List for **All Materials in All Products**

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes	Restriction Source
Inorganics	Asbestos	Crocidolite		12001-28-4	Non-use		REACH 6a, Prop 65
		Amosite		12172-73-5	Non-use		REACH 6b, Prop 65
		Anthophyllite		77536-67-5	Non-use		REACH 6c, Prop 65
		Actinolite		77536-66-4	Non-use		REACH 6d, Prop 65
		Tremolite		77536-68-6	Non-use		REACH 6e, Prop 65
		Chyrostile		12001-29-5, 132207-32-0	Non-use		REACH 6f, Prop 65
	Metals & Metalloids	Arsenic and its compounds	As	several	1,000*	*1 ppm after extraction in footwear, clothing or related accessories, and textiles which, under normal or reasonably foreseeable conditions of use, come into contact with human skin to an extent similar to clothing	REACH 19, Auth 8, 9, 24, Prop 65
		Cadmium and its compounds	Cd	several	100*	*1 ppm after extraction in footwear, clothing or related accessories, and textiles which, under normal or reasonably foreseeable conditions of use, come into contact with human skin to an extent similar to clothing	REACH 23, RoHS, Prop 65
		Chromium VI and its compounds	Cr VI	several	1,000*	*1 ppm after extraction in footwear, clothing or related accessories, and textiles which, under normal or reasonably foreseeable conditions of use, come into contact with human skin to an extent similar to clothing ;2 ppm in cement (dry weight); 3 ppm in leather (dry weight); 0.2 ppm for BN materials; 1,000 ppm for all other materials	REACH 47, Auth 16-22, 28-31, RoHS, Prop 65
		Mercury and its compounds	Hg	several	1,000		REACH 18, RoHS, Prop 65
		Lead and its compounds	Pb	several	1,000*	* Shall not be used in paint. 1 ppm after extraction in footwear, clothing or related accessories, and textiles which, under normal or reasonably foreseeable conditions of use, come into contact with human skin to an extent similar to clothing Restriction threshold is 0.35% in steel, 0.4% in aluminum, and 4% in copper alloys, 1,000 ppm in all other non-BN materials.	REACH 16, 17, 63, Auth 10-12, RoHS, Prop 65
	Borates	Sodium perborate, perboric acid, sodium salt		15120-21-5, 11138-47-9	1,000		REACH Auth 48
		Sodium peroxometaborate		7632-04-4	1,000		REACH Auth 49
	Organometals	Phenylmercury acetate	PMA	62-38-4	100		REACH 62a
		Phenylmercury propionate		103-27-5	100		REACH 62b
		Phenylmercury 2-ethylhexanoate		13302-00-6	100		REACH 62c
		Phenylmercury octanoate		13864-38-5	100		REACH 62d
		Phenylmercury neodecanoate		26545-49-3	100		REACH 62e

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes	Restriction Source
Inorganics	Organometals	Tributyl tin	TBT	several	1,000		REACH 20, Prop 65
		Triphenyl tin	TPT	several	1,000		REACH 20, Prop 65
		Dibutyl tin	DBT	several	1,000		REACH 20
		Dioctyl tin compounds	DOT	several	1,000		REACH 20
		Dibutyltin hydrogen borate		75113-37-0	1,000		REACH 21
Organohalogens		Halogenated polymers (including PVC, PTFE, etc.), halogenated organic solvents, and other highly halogenated, carbon-based materials			See Section 4.4 of the Standard	Any material containing a sum total of 10% or more of carbon-bonded fluorine, chlorine, and/or bromine by weight is considered a highly halogenated carbon-based material and is thus not permitted for use (except in exempt materials/parts as noted in Section 4.4 of the Standard).	Cradle to Cradle Certified Product Standard
	Halogenated Flame Retardants (HFRs)	General restriction on halogenated flame retardants		several	See Section 4.4 of the Standard	In addition to the restrictions on specific HFRs listed below, carbon-bonded chlorine and bromine within <u>any</u> flame retardant in the material (intentionally added or present as an impurity) must be less than 1,000 ppm (except in exempt materials/parts as noted in Section 4.4 of the Standard).	Cradle to Cradle Certified Product Standard
		Polybrominated diphenyl ethers	PBDEs	several	10*	*The 10 ppm limit applies to each individual PBDE.	REACH 45, 67, RoHS, POPs, Prop 65 (only DE-71)
		Polybrominated biphenyls	PBBs	several	Non-use*	* If present as an unintentional trace contaminant the substance must be below detection with a detection limit of 5 ppm [limit based on AFIRM's Restricted Substances List v5.0]. Restriction threshold is 0.1% (1,000 ppm) for electronic products.	REACH 8, POPs, ROHS, Prop 65
		Hexabromocyclododecane	HBCDD	3194-55-6, 25637-99-4, 134237-50-6, 134237-51-7, 134237-52-8	100		REACH Auth 3, POPs
		Tris(2-chloroethylphosphate)	TCEP	115-96-8	1,000*	*5 ppm for Children's products.	REACH Auth 13, 9/48/EC, Prop 65
	Halogenated Diphenyl Methanes	Monomethyl-tetrachlorodiphenyl methane	Ugilec 141	76253-60-6	10		REACH 24, POPs
		Monomethyl-dichloro-diphenyl methane	Ugilec 121, 21	81161-70-8	10		REACH 25, POPs
		Monomethyl-dibromo diphenyl methane bromobenzylbromotoluene, mixture of isomers	DBBT	99688-47-8	10		REACH 26, POPs
	Brominated Compounds	1-Bromopropane		106-94-5	1,000		REACH Auth 32, Prop 65

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes	Restriction Source
Organohalogens	Chlorinated Compounds	Polychlorinated terphenyls	PCTs	61788-33-8 and others	50		REACH 1
		Polychlorinated biphenyls	PCBs	several	Non-use*	* If present as an unintentional trace contaminant the substance must be present below detection with a detection limit of 0.1 ppm [limit based on Apple's Regulated Substances Specification 069-0135-K]. Testing is required for products that are colorants, dyes, or inks containing diarylide yellow, orange, and red and phthalocyanine blue and greens pigments.	POPs, Prop 65
		Polychlorinated naphthalenes		several	Non-use*	* If present as an unintentional trace contaminant, the substance must be below detection with a detection limit of 5 ppm [limit based on Apple's Regulated Substances Specification 069-0135-K]. Polychlorinated naphthalenes means chemical compounds based on the naphthalene ring system, where one or more hydrogen atoms have been replaced by chlorine atoms	POPs
		Hexachlorobutadiene	HCBD	87-68-3	Non-use*	* If present as an unintentional trace contaminant, the substance must be tested, if conducted, must be present below detection with a detection limit of 0.1 ppm [limit based on EPA test method 8260B]	POPs, Prop 65
		Pentachlorobenzene	PeCB	608-93-5	Non-use*	* If present as an unintentional trace contaminant, the substance must be below detection with a detection limit of 0.2 ppm [limit based on AFIRM's Restricted Substances List v5.0]	POPs
		Hexachloroethane (perchloroethane)	PCE	67-72-1	1,000		REACH 41, Prop 65
		Pentachlorophenol and its salts and esters	PCP	87-86-5 and others	Non-use*	* If present as an unintentional trace contaminant, the substance must be below detection with a detection limit of 0.5 ppm [limit based on AFIRM's Restricted Substances List v5.0]	REACH 22, Prop 65
		Trichlorobenzene	TCB	120-82-1	1,000		REACH 49
		Trichloroethylene	TCE	79-01-6	1,000		REACH Auth 15
		2,2'-Dichloro-4,4'-methylenedianiline	MOCA	101-14-4	1,000*	*Also see textiles list. 30 ppm for textiles.	REACH Auth 27, Prop 65
		1,2-Dichloroethane	EDC	107-06-2	1,000		REACH Auth 26, Prop 65
		Chloroethylene (Vinyl chloride monomer)	VCM	75-01-4	5*	*5 ppm for general, 1 ppm for food and medical applications; may not be used as propellant	REACH 2, ECVm, Prop 65
		Short-chain chlorinated paraffins	SCCPs	85535-84-8	1,500*	*Threshold applies to solid homogeneous materials. For liquid mixtures the restriction limit value is 1%. Note that SCCPs are listed as a Cat. 2 carcinogen in Annex VL of CLP, thus they are restricted if subject to review (≥100 ppm) at the Silver level and above and at all levels for formulated consumer products.	POPs, Prop 65
	Fluorinated Compounds	General restriction on per- or polyfluoroalkyl substances (PFASs)	PFASs	several	See Section 4.4 of the Standard	PFAS-based materials, including fluoropolymers and PFAS-coatings, are not permitted for use (except in exempt materials/parts as noted in Section 4.4 of the Standard). If present as an impurity or minor additive in an otherwise non-fluorinated organic material, carbon-bonded fluorine within PFASs in the material must be less than 1,000 ppm.	Cradle to Cradle Certified Product Standard
		Perfluorooctane sulfonic acid and its derivatives	PFOS, C-8	1763-23-1	10*	*1 ug/m ² for textiles and other coated materials	POPs
		Perfluorooctane sulfonates	PFOS, C-8 salts	several	10*	*1 ug/m ² for textiles and other coated materials	POPs
		Perfluorooctanoic acid and its salts*	PFOA	Several	25*	This includes related substances as defined in Entry 68 of REACH Annex XVII. 25 ppm threshold applies to PFOA and its salts. The sum of PFOA related substances may not exceed 1,000 ppm.	REACH 68, Prop 65

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes	Restriction Source
Polycyclic Aromatic Hydrocarbons (PAH)		Benzo[a]pyrene	BaP	50-32-8	1*	Applies to rubber or plastic materials that come into direct, prolonged, or short-term repetitive contact with the human skin or the oral cavity, under normal or reasonably foreseeable conditions of use (i.e sport equipment, household utensils, trolleys, walking frames, tools for domestic use, apparel, jewelry, etc.). *Concentration threshold is 0.5 ppm for Children's products (see Children's products list). For all relevant materials, the sum of all PAHs may not exceed 10 ppm.	REACH 50a, Prop 65
		Benzo[e]pyrene	BeP	192-97-2	1*		REACH 50b
		Benzo[a]anthracene	BaA	56-55-3	1*		REACH 50c, Prop 65
		Chrysene	CHR	218-01-9	1*		REACH 50d, Prop 65
		Benzo[b]fluoranthene	BbFA	205-99-2	1*		REACH 50e, Prop 65
		Benzo[j]fluoranthene	BjFA	205-82-3	1*		REACH 50f, Prop 65
		Benzo[k]fluoranthene	BkFA	207-08-9	1*		REACH 50g, Prop 65
		Dibenzo[a,h]anthracene	DBAhA	53-70-3	1*		REACH 50h, Prop 65
Aromatics	Ortho-phthalates	Bis (2-ethylhexyl) phthalate	DEHP	117-81-7	1,000		REACH 51a, Auth 4, RoHS, Prop 65
		Dibutyl phthalate	DBP	84-74-2	1,000		REACH 51a, Auth 6, RoHS, Prop 65
		Benzyl butyl phthalate	BBP	85-68-7	1,000		REACH 51a, Auth 5, RoHS, Prop 65
		Di-n-pentyl phthalate	DPP	131-18-0	1,000		REACH 72, REACH Auth 38
		Diisopentylphthalate	DIPP	605-50-5	1,000		REACH Auth 33
		Diisobutyl phthalate	DIBP	84-69-5	1,000		REACH Auth 7, RoHS
		1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7 rich		71888-89-6	1,000		REACH Auth 34
		1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters		68515-42-4	1,000		REACH Auth 35
		1,2-Benzenedicarboxylic acid, dipentylester, branched and linear		84777-06-0	1,000		REACH Auth 36
		Bis(2-methoxyethyl) phthalate		117-82-8	1,000		REACH Auth 37
		N-pentyl-isopentylphthalate		776297-69-9	1,000		REACH Auth 39
		1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear		68515-50-4	1,000		REACH Auth 44
		Dihexyl phthalate		84-75-3	1,000		REACH Auth 45
		1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters or mixed decyl and hexyl and octyl diesters		68648-93-1, 68515-51-5	1,000		REACH Auth 46

Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes	Restriction Source
Aromatics	Benzene	Benzene	71-43-2	1,000*	*5 ppm for children's products, footwear, clothing or related accessories, and textiles which, under normal or reasonably foreseeable conditions of use, come into contact with human skin to an extent similar to clothing; 1,000 ppm for all other product types	REACH 5, 72 Prop 65
	Aromatic Amine (Anilines)	2-Naphthylamine and its salts	91-59-8 and others	1,000		REACH 12, Prop 65
		1,1'-biphenyl-4,4'-diamine and its salts	Benzidine several	1,000		REACH 13, Prop 65
		4-Aminobiphenyl xenylamine and its salts	92-67-1 and others	1,000		REACH 15, Prop 65
		4,4'-Diaminodiphenylmethane	MDA 101-77-9	1,000*	*Also see textiles list. 30 ppm for textiles.	REACH Auth 2, Prop 65
	Phenol Derivatives	Nonylphenols	NP several	1,000		REACH 46a
		Nonylphenol ethoxylates	NPE several	1,000		REACH 46b
		2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol	UV-328 25973-55-1	1,000		REACH Auth 51
		2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol	UV-327 3864-99-1	1,000		REACH Auth 52
		2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol	UV-350 36437-37-3	1,000		REACH Auth 53
		2-benzotriazol-2-yl-4,6-di-tert-butylphenol	UV-320 3846-71-7	1,000		REACH Auth 54
		4-(1,1,3,3-Tetramethyl)phenol, ethoxylated	several*	1,000	*Covers well-defined substances, those of unknown or variable composition, complex reaction products, biological (UVCB) substances, polymers and homologues. Including, but not limited to CASRNs: 9002-93-1, 2497-59-8, 2315-67-5, and 2315-61-9.	REACH Auth 42
		4-Nonylphenol, branched and linear, ethoxylated	several*	1,000	*Substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, ethoxylated covering UVCB- and well-defined substances, polymers and homologues, which include any of the individual isomers and/or combinations thereof. Including, but not limited to CASRNs: 7311-27-5, 14409-72-4, 20427-84-3, 68412-54-4, 26027-38-3, 27942-27-4, 9016-45-9, 1119449-38-5, 1119449-37-4, 9016-45-9, 37205-87-1, 127087-87-0, and 26571-11-9.	REACH Auth 43
		Trixylyl phosphate	25155-23-1	1,000		REACH Auth 47
	Nitroaromatics	5-tert-butyl-2,4,6-trinitro-m-xylene	Musk xylene 81-15-2	1,000		REACH Auth 1
		4-nitrobiphenyl	92-93-3	1,000		REACH 14, Prop 65
		2,4-Dinitrotoluene	DNT 121-14-2	1,000		REACH Auth 14, Prop 65

Tar Products		Anthracene oil		90640-80-5	1,000		REACH Auth 40
		Pitch, coal tar, high temp.		65996-93-2	1,000		REACH Auth 41
Organic Solvents	(Note: see also 'Organohalogens' for halogenated organic solvents]	Formaldehyde, oligomeric reaction products with aniline		25214-70-4	1,000		REACH Auth 23
		Bis(2-methoxyethyl) ether	Diglyme	111-96-6	1,000		REACH Auth 25
		Dimethylfumarate	DMF	624-49-7	0.1		REACH 61
		5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2]	1,3-dioxanes	several*	1,000	* covering any of the individual stereoisomers of [1] and [2] or any combination thereof. Including, but not limited to CASRNs: 117933-89-8 and 117933-89-8.	REACH Auth 50

5. Additional Restrictions for Biological Nutrient Materials

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes		Restriction Source
Inorganics	Metals, Metalloids, & Selenium	Aluminum and its compounds	Al	several	70,000*	Values here are metal migration limits rather than bulk concentration limits. If a limit is exceeded by a homogeneous material in bulk, compliance may alternatively be demonstrated by showing that the amount of leachable metal per bulk material (mg/kg) is below the relevant specified limit as per DIN EN 71-3: 2013.	*1,460 ppm in liquids; 5,625 ppm in brittle, powder-like or pliable products/materials	9/48/EC
		Antimony and its compounds	Sb	several	560*		*11.3 ppm in liquids; 45 ppm in brittle, powder-like or pliable products/materials	9/48/EC, Prop 65
		Arsenic and its compounds	As	several	47*		*0.9 ppm in liquids; 3.8 ppm in brittle, powder-like or pliable products/materials	9/48/EC, Prop 65
		Barium and its compounds	Ba	several	18,750*		*375 ppm in liquids; 1,500 ppm in brittle, powder-like or pliable products/materials	9/48/EC
		Boron and its compounds	B	several	15,000*		*300 ppm in liquids; 1,200 ppm in brittle, powder-like or pliable products/materials	9/48/EC
		Cadmium and its compounds	Cd	several	17*		*0.3 ppm in liquids; 1.3 ppm in brittle, powder-like or pliable products/materials	9/48/EC, Prop 65
		Chromium, trivalent and its compounds	Cr III	several	460*		*9.4 ppm in liquids; 37.5 ppm in brittle, powder-like or pliable products/materials	9/48/EC
		Chromium, hexavalent, and its compounds	Cr VI	several	0.2*		*0.005 ppm in liquids; 0.02 ppm in brittle, powder-like or pliable products/materials	9/48/EC, Prop 65
		Cobalt and its compounds	Co	several	130*		*2.6 ppm in liquids; 10.5 ppm in brittle, powder-like or pliable products/materials	9/48/EC, Prop 65
		Copper and its compounds	Cu	several	7,700*		*156 ppm in liquids; 622.5 ppm in brittle, powder-like or pliable products/materials	9/48/EC
		Lead and its compounds	Pb	several	160*		*3.4 ppm in liquids; 13.5 ppm in brittle, powder-like or pliable products/materials (including paint); Shall not be used in paint.	17, 9/48/EC, Prop 65
		Manganese and its compounds	Mn	several	15,000*		*300 ppm in liquids; 1,200 ppm in brittle, powder-like or pliable products/materials	9/48/EC
		Mercury and its compounds	Hg	several	94*		*1.9 ppm in liquids; 7.5 ppm in brittle, powder-like or pliable products/materials	9/48/EC, Prop 65
		Nickel and its compounds	Ni	several	930*		*18.8 ppm in liquids; 75 ppm in brittle, powder-like or pliable products/materials	9/48/EC, Prop 65
		Selenium and its compounds	Se	several	460*		*9.4 ppm in liquids; 37.5 ppm in brittle, powder-like or pliable products/materials	9/48/EC
		Strontium and its compounds	Sr	several	56,000*		*1,125 ppm in liquids; 4,500 ppm in brittle, powder-like or pliable products/materials	9/48/EC
		Tin and its compounds	Sn	several	180,000*		*3,750 ppm in liquids; 15,000 ppm in brittle, powder-like or pliable products/materials	9/48/EC
		Organostannic compounds	Organic Sn	several	12*		*shall not be used as biocide; 0.2 ppm in liquids; 0.9 ppm in brittle, powder-like or pliable products/materials	REACH 20, 9/48/EC
		Zinc and its compounds	Zn	several	46,000*		*938 ppm in liquids; 3,750 ppm in brittle, powder-like or pliable products/materials	9/48/EC

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes	Restriction Source
Tar Products		Creosote; wash oil		8001-58-9	1,000*	*shall not be used as intentional input or treatment for wood materials (in any amount), 1,000 ppm threshold applies to wood materials where prior application is unknown (i.e. recycled wood etc.)	REACH 31a
		Creosote oil; wash oil		61789-28-4	1,000*		REACH 31b
		Distillates (coal tar), naphthalene oils; naphthalene oil		84650-04-4	1,000*		REACH 31c
		Creosote oil, acenaphthene fraction; wash oil		90640-84-9	1,000*		REACH 31d
		Distillates (coal tar), upper; heavy anthracene oil		65996-91-0	1,000*		REACH 31e
		Tar acids, coal, crude; crude phenols		65996-85-2	1,000*		REACH 31g
		Creosote, wood		8021-39-4	1,000*		REACH 31h
		Low temperature tar oil, alkaline; extract residues (coal), low temperature coal tar alkaline		122384-78-5	1,000*		REACH 31i
Pesticides		Endosulfan Isomers	Many	several	Non-use*	*These substances are banned as intentional inputs for all BN materials in certified products, but must only be tested for in materials derived from agricultural products (i.e. plant or animal tissues/fibers) and be shown to be present below 0.5 ppm in such cases [limit based on AFIRM's Restricted Substances List v5.0]	POPs
		Aldrin	HHDN	309-00-2	Non-use*		POPs, Prop 65
		Alpha-hexachlorocyclohexane	alpha-HCH	319-84-6	Non-use*		POPs, Prop 65
		Beta-hexachlorocyclohexane	beta-HCH	319-85-7	Non-use*		POPs, Prop 65
		Chlordane	Many	57-74-9	Non-use*		POPs, Prop 65
		Chlordecone	Kepone	143-50-0	Non-use*		POPs, Prop 65
		Dieldrin	HEOD	60-57-1	Non-use*		POPs, Prop 65
		Endosulfan	Many	115-29-7, 959-98-8, 33213-65-9	Non-use*		POPs
		Endosulfan sulfate		1031-07-8	Non-use*		POPs
		Endrin	Many	72-20-8	Non-use*		POPs, Prop 65
		Heptachlor	Many	76-44-8	Non-use*		POPs, Prop 65
		Hexachlorobenzene	HCB	118-74-1	Non-use*		POPs, Prop 65
		Lindane (gamma-HCH)	γ-HCH	58-89-9	Non-use*		POPs
		Mirex		2385-85-5	Non-use*		POPs, Prop 65

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes	Restriction Source
Pesticides		P,P'-dichlorodiphenyltrichloroethane	DDT	50-29-3	Non-use*	*These substances are banned as intentional inputs for all BN materials in certified products, but must only be tested for in materials derived from agricultural products (i.e. plant or animal tissues/fibers) and be shown to be present below 0.5 ppm in such cases.	POPs, Prop 65
		Toxaphene	Many	92-93-3	Non-use*		POPs, Prop 65
Other	Organic Substances	Acrylamide		79-06-1	1,000		REACH 60, Prop 65
		Bisphenol A	BPA	80-05-7	200		REACH 66, Prop 65
		Bisphenol S	BPS	80-09-1	200	BPS added to restriction here based on the EU Committee for Risk Assessment (RAC) conclusion that it could be a likely substitute with comparable risk profile: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32016R2235	REACH 66
	Inorganic Salts	Inorganic ammonium salts		several	3*	*Shall not be used in cellulose insulation mixtures or cellulose insulation articles unless the emission of ammonia from those mixtures or articles results in a concentration of less than 3 ppm by volume (see ECHA for test details)	REACH 65

6. Additional Restrictions for Children's Products

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes	Restriction Source
CMRs	Category 1 & 2	Substances classified as carcinogenic, mutagenic or toxic for reproduction of category 1A, 1B or 2 under Regulation (EC) No 1272/2008 (CLP)	CMRs	Several	1,000*	<p>* Limit is 200 ppm for gaseous preparations, where specific limits are noted in CLP Annex VI, those take precedence. Exceptions & exemptions specified in 2009/48/EC apply (i.e. for substances and mixtures that are inaccessible to children in any form, including inhalation or are listed as permitted in Appendix A of 2009/48/EC, such as nickel).</p> <p>An xlsx version of CLP Annex VI can be downloaded from ECHA here: https://echa.europa.eu/information-on-chemicals/annex-vi-to-clp.</p> <p>A single, fully searchable list is available through Pharos (https://www.pharosproject.net/hazard/list/show/324).</p>	9/48/EC, Prop 65
Polycyclic Aromatic Hydrocarbons (PAHs)		Benzo[a]pyrene	BaP	50-32-8	0.5*	<p>Applies to rubber or plastic materials that come into direct as well as prolonged or short-term repetitive contact with the human skin or the oral cavity.</p> <p>* the sum of all PAHs may not exceed 10 ppm.</p>	REACH 50a, Prop 65
		Benzo[e]pyrene	BeP	192-97-2	0.5*		REACH 50b
		Benzo[a]anthracene	BaA	56-55-3	0.5*		REACH 50c, Prop 65
		Chrysene	CHR	218-01-9	0.5*		REACH 50d, Prop 65
		Benzo[b]fluoranthene	BbFA	205-99-2	0.5*		REACH 50e, Prop 65
		Benzo[j]fluoranthene	BjFA	205-82-3	0.5*		REACH 50f, Prop 65
		Benzo[k]fluoranthene	BkFA	207-08-9	0.5*		REACH 50g, Prop 65
		Dibenzo[a,h]anthracene	DBA _h A	53-70-3	0.5*		REACH 50h, Prop 65
Other	Organic Substances	Toluene		108-88-3	1,000		REACH 48, Prop 65
		2-(2-methoxyethoxy)ethanol	DEGME	111-77-3	1,000		REACH 54
		Cyclohexane		110-82-7	1,000		REACH 57
		Acrylamide		79-06-1	1,000		REACH 60, Prop 65
		Bisphenol A	BPA	80-05-7	200		REACH 66, Prop 65
		Bisphenol S	BPS	80-09-1	200	BPS added to restriction here based on the EU Committee for Risk Assessment (RAC) conclusion that it could be a likely substitute with comparable risk profile: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32016R2235	REACH 66
		Di-isononyl phthalate	DINP	28553-12-0, 68515-48-0	1,000		REACH 52a, Prop 65
		Di-isodecyl phthalate	DIDP	26761-40-0, 68515-49-1	1,000		REACH 52b, Prop 65
		Di-n-octyl phthalate	DNOP	117-84-0	1,000		REACH 52c

Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes	Restriction Source
Inorganics	Aluminum and its compounds	Al	several	70,000*	Values here are metal migration limits rather than bulk concentration limits. If a limit is exceeded by a homogeneous material in bulk, compliance may alternatively be demonstrated by showing that the amount of leachable metal per bulk material (mg/kg) is below the relevant specified limit as per DIN EN 71-3: 2013.	*1,460 ppm in liquids; 5,625 ppm in brittle, powder-like or pliable products/materials 9/48/EC
	Antimony and its compounds	Sb	several	560*		*11.3 ppm in liquids; 45 ppm in brittle, powder-like or pliable products/materials 9/48/EC, Prop 65
	Arsenic and its compounds	As	several	47*		*0.9 ppm in liquids; 3.8 ppm in brittle, powder-like or pliable products/materials 9/48/EC, Prop 65
	Barium and its compounds	Ba	several	18,750*		*375 ppm in liquids; 1,500 ppm in brittle, powder-like or pliable products/materials 9/48/EC
	Boron and its compounds	B	several	15,000*		*300 ppm in liquids; 1,200 ppm in brittle, powder-like or pliable products/materials 9/48/EC
	Cadmium and its compounds	Cd	several	17*		*0.3 ppm in liquids; 1.3 ppm in brittle, powder-like or pliable products/materials 9/48/EC, Prop 65
	Chromium, trivalent and its compounds	Cr III	several	460*		*9.4 ppm in liquids; 37.5 ppm in brittle, powder-like or pliable products/materials 9/48/EC
	Chromium, hexavalent, and its compounds	Cr VI	several	0.2*		*0.005 ppm in liquids; 0.02 ppm in brittle, powder-like or pliable products/materials 9/48/EC, Prop 65
	Cobalt and its compounds	Co	several	130*		*2.6 ppm in liquids; 10.5 ppm in brittle, powder-like or pliable products/materials 9/48/EC, Prop 65
	Copper and its compounds	Cu	several	7,700*		*156 ppm in liquids; 622.5 ppm in brittle, powder-like or pliable products/materials 9/48/EC
	Lead and its compounds	Pb	several	160*		*3.4 ppm in liquids; 13.5 ppm in brittle, powder-like or pliable products/materials (including paint); Shall not be used in paint. 17, 9/48/EC, Prop 65
	Manganese and its compounds	Mn	several	15,000*		*300 ppm in liquids; 1,200 ppm in brittle, powder-like or pliable products/materials 9/48/EC
	Mercury and its compounds	Hg	several	94*		*1.9 ppm in liquids; 7.5 ppm in brittle, powder-like or pliable products/materials 9/48/EC, Prop 65
	Nickel and its compounds	Ni	several	930*		*18.8 ppm in liquids; 75 ppm in brittle, powder-like or pliable products/materials 9/48/EC, Prop 65
	Selenium and its compounds	Se	several	460*		*9.4 ppm in liquids; 37.5 ppm in brittle, powder-like or pliable products/materials 9/48/EC
	Strontium and its compounds	Sr	several	56,000*		*1,125 ppm in liquids; 4,500 ppm in brittle, powder-like or pliable products/materials 9/48/EC
	Tin and its compounds	Sn	several	180,000*		*3,750 ppm in liquids; 15,000 ppm in brittle, powder-like or pliable products/materials 9/48/EC
	Organostannic compounds	Organic Sn	several	12*		*shall not be used as biocide; 0.2 ppm in liquids; 0.9 ppm in brittle, powder-like or pliable products/materials REACH 20, 9/48/EC
	Zinc and its compounds	Zn	several	46,000*		*938 ppm in liquids; 3,750 ppm in brittle, powder-like or pliable products/materials 9/48/EC

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes	Restriction Source
Allergenic Fragrances		1-(<i>p</i> -Methoxyphenyl)-1-penten-3-one		104-27-8	Non-use		9/48/EC
		2-Pentylidene-cyclohexanone		25677-40-1	Non-use		9/48/EC
		2,4-Dihydroxy-3-methylbenzaldehyde		6248-20-0	Non-use		9/48/EC
		3,7-Dimethyl-2-octen-1-ol	6,7-Dihydrogeraniol	40607-48-5	Non-use		9/48/EC
		3,6,10-Trimethyl-3,5,9-undecatrien-2-one		1117-41-5	Non-use		9/48/EC
		4- <i>tert</i> -Butylphenol		98-54-4	Non-use		9/48/EC
		4-(<i>p</i> -Methoxyphenyl)-3-butene-2-one		943-88-4	Non-use		9/48/EC
		4-Ethoxyphenol	4-EP	622-62-8	Non-use		9/48/EC
		4-Methoxyphenol	4-MP	150-76-5	Non-use		9/48/EC
		4-Phenyl-3-buten-2-one		122-57-6	Non-use		9/48/EC
		4,6-Dimethyl-8- <i>tert</i> -butylcoumarin		17874-34-9	Non-use		9/48/EC
		5-Methyl-2,3-hexanedione		13706-86-0	Non-use		9/48/EC
		6-Isopropyl-2-decahydronaphthalenol		34131-99-2	Non-use		9/48/EC
		6-Methylcoumarin		92-48-8	Non-use		9/48/EC
		6,10-Dimethyl-3,5,9-undecatrien-2-one		0141-10-6	Non-use		9/48/EC
		7-Ethoxy-4-methylcoumarin		87-05-8	Non-use		9/48/EC
		7-Methoxycoumarin	Herniarin	531-59-9	Non-use		9/48/EC
		7-Methylcoumarin		2445-83-2	Non-use		9/48/EC
		7,11-Dimethyl-4,6,10-dodecatrien-3-one		26651-96-7	Non-use		9/48/EC
		Alanroot oil (Inula helenium)		97676-35-2	Non-use		9/48/EC
		Allylthiocyanate		57-06-7	Non-use		9/48/EC
		Amyl cinnamal		122-40-7	Non-use		9/48/EC

Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes	Restriction Source
Allergenic Fragrances	Amylcinnamyl alcohol		101-85-9	Non-use		9/48/EC
	Benzyl alcohol		100-51-6	Non-use		9/48/EC
	Benzyl cyanide	BnCn	140-29-4	Non-use		9/48/EC
	Benzyl salicylate		118-58-1	Non-use		9/48/EC
	Chenopodium oil		8006-99-3	Non-use		9/48/EC
	Cinnamal		104-55-2	Non-use		9/48/EC
	Cinnamyl alcohol		104-54-1	Non-use		9/48/EC
	Citral		5392-40-5	Non-use		9/48/EC
	Costus root oil (Saussurea lappa Clarke)		8023-88-9	Non-use		9/48/EC
	Coumarin		91-64-5	Non-use		9/48/EC
	Cyclamen alcohol		4756-19-8	Non-use		9/48/EC
	Diethyl maleate		0141-05-09	Non-use		9/48/EC
	Dihydrocoumarin		119-84-6	Non-use		9/48/EC
	Dimethyl citraconate		617-54-9	Non-use		9/48/EC
	Diphenylamine		122-39-4	Non-use		9/48/EC
	Ethyl acrylate		140-88-5	Non-use		9/48/EC, Prop 65
	Eugenol		97-53-0	Non-use		9/48/EC
	Fig leaf, fresh and preparations		68916-52-9	Non-use		9/48/EC
	Hexahydrocoumarin		700-82-3	Non-use		9/48/EC
	Hydroabietyl alcohol		13393-93-6	Non-use		9/48/EC
	Hydroxy-citronellal		107-75-5	Non-use		9/48/EC
	Hydroxy-methylpentylcyclohexenecarboxaldehyde		31906-04-04	Non-use		9/48/EC
	Isoeugenol		97-54-1	Non-use		9/48/EC
	Methyl trans-2-butenate		623-43-8	Non-use		9/48/EC

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes	Restriction Source
Allergenic Fragrances		4-tert-Butyl-3-methoxy-2,6-dinitrotoluene	Musk ambrette	83-66-9	Non-use		9/48/EC
		Oakmoss extracts		90028-68-5	Non-use		9/48/EC
		Peru balsam, crude (Exudation of Myroxylon pereirae (Royle) Klotzsch)		8007-00-9	Non-use		9/48/EC
		trans-2-Heptenal		18829-55-5	Non-use		9/48/EC
		trans-2-Hexenal diethyl acetal		67746-30-9	Non-use		9/48/EC
		trans-2-Hexenal dimethyl acetal		18318-83-7	Non-use		9/48/EC
		Treemoss extracts		90028-67-4	Non-use		9/48/EC
		Verbena oil (Lippia citriodora Kunth)		8024-12-2	Non-use		9/48/EC

7. Additional Restrictions for Formulated Consumer Products

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes	Restriction Source
CMRs	Category 1 & 2	Substances classified as carcinogenic, mutagenic or toxic for reproduction category 1 or 2 under Regulation (EC) No 1272/2008 (CLP) and listed in Appendices 1-6 of REACH		several	1,000*	<p>*Limit is 200 ppm for gaseous preparations, where specific limits are noted for a substance in Appendices 1-6 of REACH, those take precedence.</p> <p>The full list of chemicals with CASRNs can be found in Appendices 1-6 of REACH: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2006R1907:20130701:EN:PDF#page=254.</p> <p>A single, fully searchable list is available through Pharos (http://www.pharosproject.net/hazard/list/show/306).</p> <p>Note: REACH Appendices 1-6 contain a subset of the substances classified as CMRs under CLP, but all CLP CMRs will be added to the REACH Appendices eventually.</p>	REACH 28-30, Prop 65
Organohalogens		Chloroform		67-66-3	1,000		REACH 32, Prop 65
		1,1,2-Trichloroethane	1,1,3=TCA	79-00-5	1,000		REACH 34, Prop 65
		1,1,2,2-Tetrachloroethane	R-130	79-34-5	1,000		REACH 35, Prop 65
		1,1,1,2-Tetrachloroethane	R-130a	630-20-6	1,000		REACH 36, Prop 65
		Pentachloroethane		76-01-7	1,000		REACH 37
		1,1-Dichloroethene	DCE	75-35-4	1,000		REACH 38, Prop 65
		Dichloromethane	DCM	75-09-2	1,000		REACH 59, Prop 65
Diisocyanates		4,4'-Diphenylmethane diisocyanate	MDI	101-68-8	1,000		REACH 56a
		2,4'-Diphenylmethane diisocyanate	2,4'-MDI	5873-54-1	1,000		REACH 56b
		2,2'-Diphenylmethane diisocyanate	2,2'-MDI	219-799-4	1,000		REACH 56c
Other	Organic Substances	Acrylamide		79-06-1	1,000		REACH 60, Prop 65
		Toluene		108-88-3	1,000		REACH 48, Prop 65
		2-(2-methoxyethoxy)ethanol	DEGME	111-77-3	1,000		REACH 54
		2-(2-butoxyethoxy)ethanol	DEGBE	112-34-5	30,000	Restricted as a constituent of spray paints or spray cleaners in aerosol dispensers	REACH 55
		Cyclohexane		110-82-7	1,000		REACH 57

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes	Restriction Source
Other	Organic Substances	N-methyl-2-pyrrolidone; 1-methyl-2-pyrrolidone	NMP	872-50-4	3,000		REACH 71, Prop 65
		Octamethylcyclotetrasiloxane	D4	556-67-2	1,000	Restricted as a constituent of cosmetic products that under normal conditions of use, are washed off with water after application	REACH 70
		Decamethylcyclopentasiloxane	D5	541-02-6	1,000	Restricted as a constituent of cosmetic products that under normal conditions of use, are washed off with water after application	REACH 70
		Methanol		67-56-1	6,000	Restricted as a constituent of windscreen washing or defrosting fluids	REACH 69, Prop 65

8. Additional Restrictions for Textile Materials

Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Max. allowable concentration (ppm)	Restriction Notes	Restriction Source
Aromatics	2-naphthylamine		91-59-8	30	<p>This restriction applies to the concentration of aromatic amines in the finished product. While not intentionally added, these aromatic amines can be present in textile materials as a breakdown product formed through reductive cleavage from certain azocolourants. Compliance with this restriction is most effectively evaluated by determining whether any azocolourants capable of producing any of these aromatic amines through reductive cleavage were used in the dyeing of a fabric.</p> <p>Alternatively, the analytical tests methods set forth in Appendix 10 of REACH (http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2006R1907:20130701:EN:PDF#page=517) may be used to verify compliance with this set of restrictions.</p>	REACH 43, Prop 65
	2,4,5-trimethylaniline		137-17-7	30		REACH 43, Prop 65
	3,3'-dichlorobenzidine		91-94-1	30		REACH 43, Prop 65
	o-dianisidine		119-90-4	30		REACH 43, Prop 65
	3,3'-dimethylbenzidine		119-93-7	30		REACH 43, Prop 65
	4-Aminoazobenzene		60-09-3	30		REACH 43, Prop 65
	4-chloro-o-toluidine	4-COT	95-69-2	30		REACH 43, Prop 65
	4-chloroaniline		106-47-8	30		REACH 43, Prop 65
	4-methoxy-m-phenylenediamine		615-05-4	30		REACH 43, Prop 65
	4-methyl-m-phenylenediamine		95-80-7	30		REACH 43, Prop 65
	4,4'-methylene-bis-(2-chloro-aniline)	MOCA, MBOCA	101-14-4	30		REACH 43, Prop 65
	4,4'-methylenedi-o-toluidine		838-88-0	30		REACH 43, Prop 65
	4,4'-diaminodiphenylmethane	MDA	101-77-9	30		REACH 43, Prop 65
	4,4'-oxydianiline		101-80-4	30		REACH 43, Prop 65
	4,4'-thiodianiline	TDA	139-65-1	30		REACH 43, Prop 65
	5-nitro-o-toluidine		99-55-8	30		REACH 43
	6-methoxy-m-toluidine	p-Cresidine	120-71-8	30		REACH 43, Prop 65
	1,1'-biphenyl-4,4'-diamine and its salts	Benzidine	92-87-5	30		REACH 43, Prop 65
	4-aminobiphenyl xenylamine		92-67-1	30		REACH 43, Prop 65
	o-aminoazotoluene		97-56-3	30		REACH 43, Prop 65
	o-anisidine		90-04-0	30		REACH 43, Prop 65
	o-toluidine		95-53-4	30		REACH 43, Prop 65

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Maximum threshold (ppm)	Restriction Notes	Restriction Source
Aromatics	Azo Dye	Chromate(2-), [1-[(5-chloro-2-hydroxyphenyl) azo]-2-naphthalenolato(2-)][4-hydroxy-3-[(2-hydroxy-3,5-dinitrophenyl)azo]-7-[(4-methoxyphenyl)amino]-2-naphthalenesulfonato(3-)]-, disodium		118685-33-9	1,000		REACH 43
	Phenol Derivatives	Nonylphenol ethoxylates		several	100		REACH 46a
Flame Retardant		Tris(2,3-dibromopropyl) phosphate	TDPP, Tris	126-72-7	1,000*	*Shall not be used in textile articles, such as garments, undergarments and linen, intended to come into contact with the skin.	REACH 4, Prop 65
		Tris(aziridinyl)phosphin oxide		545-55-1	*	*Shall not be used in textile articles, such as garments, undergarments and linen, intended to come into contact with the skin. If present as an unintentional trace contaminant the substance must be below detection with a detection limit of 5 ppm [limit based on AFIRM's Restricted Substances List v5.0].	REACH 7
Organohalogens	Fluorinated Compounds	Perfluorooctane sulfonic acid	PFOS, C-8	1763-23-1	*	*1 ug/m ²	POPs
		Perfluorooctane sulfonates	PFOS, C-8 salts	several	*	*1 ug/m ²	POPs
		Perfluorooctanesulfonyl fluoride	PFOSF, C-8	307-35-7	*	*1 ug/m ²	POPs

9. Additional Restrictions for Footwear, Apparel & Jewelry Products

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Maximum threshold (ppm)	Restriction Notes	Restriction Source
Inorganics	Metals & Metalloids	Nickel compounds	Ni	several	500*	<p>This restriction applies to metallic materials intended to come into direct and prolonged contact with the skin, in particular jewelry and metallic parts of garments and apparel products such as rivet buttons, tighteners, rivets, zippers, and metal marks. It also applies to any other product containing metallic materials intended to come into direct and prolonged contact with the skin such as mobile phones and cases, glasses and sun-glasses, wrist-watch cases, watch straps, tighteners, etc.</p> <p>*Alternatively, compliance with this restriction for alloys containing more than 500 ppm nickel, may be demonstrated by having an accredited laboratory conduct leaching tests on the material in accordance with the standards adopted by the European Committee for Standardization. In this case, the test must show that nickel release rates are below 0.5 ug/cm2/week or below 0.2 ug/cm2/week for parts of products inserted into pierced ears and other pierced parts of the human body. As of the time of writing the applicable test methods are EN 1811 and if nickel-containing alloy is coated additionally EN 12472. EN 16128 is to be used for glasses. Any future applicable test methods that may be released by the European Committee for Standardization for nickel leaching tests are also to be used.</p>	REACH 27, Prop 65
		Lead compounds	Pb	several	200	This threshold applies to Pb in jewelry or apparel applications (buttons, zippers, bracelets, etc.) instead of the 1,000 ppm threshold on the general Banned List	REACH 43, Prop 65
Polycyclic Aromatic Hydrocarbons (PAHs)		Benzo[a]anthracene	BaA	56-55-3	1		REACH 72, Prop 65
		Benzo[b]fluoranthene	BbFA	205-99-2	1		REACH 72, Prop 65
		Benzo[a]pyrene	BaP	50-32-8	1		REACH 72, Prop 65
		Benzo[e]pyrene	BeP	192-97-2	1		REACH 72
		Benzo[j]fluoranthene	BjFA	205-82-3	1		REACH 72, Prop 65
		Benzo[k]fluoranthene	BkFA	207-08-9	1		REACH 72, Prop 65
		Chrysene	CHR	218-01-9	1		REACH 72, Prop 65
		Dibenzo[a,h]anthracene	DBAhA	53-70-3	1		REACH 72, Prop 65

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Maximum threshold (ppm)	Restriction Notes	Restriction Source
Dyes and Dye Precursors		1,4,5,8-tetraaminoanthraquinone	C.I. Disperse Blue 1	2475-45-8	50		REACH 72, Prop 65
		Benzenamine, 4,4'-(4-iminocyclohexa-2,5-dienyldienemethylene)dianiline hydrochloride	C.I. Basic Red 9	569-61-9	50		REACH 72, Prop 65
		[4-[4,4'-bis(dimethylamino)benzhydrylidene]cyclohexa-2,5-dien1-ylidene]dimethylammonium chloride	C.I. Basic Violet 3 with ≥ 0,1 % of Michler's ketone	548-62-9	50		REACH 72, Prop 65
		4-chloro-o-toluidinium chloride		3165-93-3	30		REACH 72
		2-Naphthylammoniumacetate		553-00-4	30		REACH 72
		4-methoxy-m-phenylene diammonium sulphate; 2,4-diaminoanisole sulphate		39156-41-7	30		REACH 72, Prop 65
		2,4,5-trimethylaniline hydrochloride		21436-97-5	30		REACH 72
		Quinoline		91-22-5	50		REACH 72
Phthalates		1,2-benzenedicarboxylic acid; diC 6-8-branched alkylesters, C 7- rich		71888-89-6	1,000*	Threshold applies individually or in combination with other phthalates on this RSL.	REACH 72
		Bis(2-methoxyethyl) phthalate		117-82-8	1,000*		REACH 72
		Diisopentylphthalate		605-50-5	1,000*		REACH 72
		Di-n-hexyl phthalate	DnHP	84-75-3	1,000*		REACH 72, Prop 65
Other	Organic Substances	α,α,α,4-tetrachlorotoluene; p-chlorobenzotrichloride		5216-25-1	1		REACH 72, Prop 65
		α,α,α-trichlorotoluene; benzotrichloride		98-07-7	1		REACH 72, Prop 65
		α-chlorotoluene; benzyl chloride		100-44-7	1		REACH 72, Prop 65
		Formaldehyde		50-00-0	75		REACH 72, Prop 65
		N-methyl-2-pyrrolidone; 1- methyl-2-pyrrolidone	NMP	872-50-4	3,000		REACH 72, Prop 65
		N,N-dimethylacetamide	DMAC	127-19-5	3,000		REACH 72, Prop 65

	Sub-Grouping	Chemical(s) Name	Acronym or Trade Name	CAS Number(s)	Maximum threshold (ppm)	Restriction Notes	Restriction Source
Other	Organic Substances	N,N-dimethylformamide; dimethyl formamide	DMF	68-12-2	3,000		REACH 72, Prop 65



**CRADLE TO CRADLE CERTIFIED™
PRODUCT STANDARD
VERSION 4**

**VOLATILE ORGANIC COMPOUND (VOC)
EMISSIONS TESTING**

SECOND DRAFT FOR PUBLIC COMMENT

Demonstrating Low VOC Emissions

For the Silver level, one of the following or an equivalent must be used to demonstrate low VOC emissions:

1. Schemes that are recognized at the general level by BREEAM for the VOC Emissions from Building Products credit. Formaldehyde emissions must be $\leq 10 \mu\text{g}/\text{m}^3$ at 28 days or sooner following storage in a ventilated test chamber. [REF: GN22: BREEAM Recognized Schemes for Emissions from Building Products, Table 2, version 2.1 of October 2016 or later]
2. Schemes that are recognized at the general level by the BREEAM International New Construction 2016 or later Technical Standard. Formaldehyde emissions must be $\leq 10 \mu\text{g}/\text{m}^3$ at 28 days or sooner following storage in a ventilated test chamber. [REF: BREEAM International New Construction 2016 or later Technical Standard, Hea 02 Indoor Air Quality, table 17.]
3. Certifications and labels recognized for LEED v4 or later EQ Credit Low-Emitting Materials. [REF: LEED v4 EQ Credit Low-Emitting Materials Third Party Certifications and Labels - version of June 2017 or later] Any mentioned additional requirements, supplemental to the respective program must also be fulfilled.
4. Per LEED v4 or LEED v4.1 General emissions evaluation, option 1 - compliance with CDPH Standard Method v1.1 or later, including a statement of the exposure scenarios and disclosure of the TVOC range.
5. Per LEED v4 or LEED v4.1 General emissions evaluation, option 2 - compliance with AgBB (2015 or later), including formaldehyde emissions $\leq 10 \mu\text{g}/\text{m}^3$. The TVOC range must be disclosed if complying with LEED v4.1.
6. For textile floor coverings: Schemes and labels listed in DGNB System 2018 or later, ENV 1.2 Local and Environmental Impact, Appendix 1 Criteria Matrix (all quality levels). Formaldehyde emissions must be $\leq 10 \mu\text{g}/\text{m}^3$ at 28 days or sooner following storage in a ventilated test chamber.
7. For resilient/elastic floor coverings: Compliance with RAL UZ 120 and formaldehyde $\leq 10 \mu\text{g}/\text{m}^3$ at 28 days or sooner following storage in a ventilated test chamber (note: this also fulfills the Gold level requirement below).
8. For composite wood (not in finished products such as furniture or flooring): Compliance with CARB ULEF or NAF requirements, or 100% of the European E1 formaldehyde class as tested per EN 717 or EN 16516.
9. For furniture: Compliance with ANSI/BIFMA e3-2014 or later version Furniture Sustainability Standard, Section 7.6.2 or 7.6.3 (note: this also fulfills the Gold level requirement below).

Demonstrating Very Low to No VOC Emissions

For the Gold and Platinum levels, one of the following or an equivalent must be used to demonstrate very low to no VOC emissions:

1. Schemes that are recognized at the exemplary level by BREEAM for VOC Emissions from Building Products credit. [REF: GN22: BREEAM Recognized Schemes for Emissions from Building Products, Table 2, version 2.1 of October 2016 or later]

2. Schemes that are recognized at the exemplary level by the BREEAM International New Construction 2016 or later Technical Standard. [REF: BREEAM International New Construction 2016 or later Technical Standard, Hea 02 Indoor Air Quality, table 17]
3. Per LEED v4 or LEED v4.1 General emissions evaluation, option 1 - compliance with CDPH Standard Method v1.1 or later and TVOC emissions no higher than 0.5 mg/m³ (500 µg/m³) at a time point no later than 14 days of storage in a ventilated test chamber, or after 10 days conditioning and 4 days of storage in a ventilated test chamber.
4. Per LEED v4 or LEED v4.1 General emissions evaluation, option 2 - compliance with AgBB (2015 or later), including formaldehyde emissions ≤10 µg/m³ and TVOC emissions ≤ 0.3 mg/m³ (300 µg/m³) at a time point not later than 28 days of storage in a ventilated test chamber.
5. Schemes and labels listed in DGNB System 2018 or later, ENV 1.2 Local and Environmental Impact, Appendix 1 Criteria Matrix as follows:
 - a. For textile floor coverings: compliance with any quality level and demonstration that formaldehyde is ≤10 µg/m³ at 28 days or sooner following storage in a ventilated test chamber.
 - b. For primers, precoats, fillers, and adhesives under wall and floor coverings, compliance with quality levels 2, 3, or 4.
 - c. For barrier coatings, resin screeds, and seals under tiles, compliance with quality levels 3 or 4.
 - d. For polyurethane and silane modified polymers used as sealing compounds, compliance with quality levels 3 or 4.
6. For resilient/elastic floor coverings: Compliance with RAL UZ 120 and formaldehyde ≤10 µg/m³ at 28 days or sooner following storage in a ventilated test chamber.
7. For composite wood (not in finished products such as furniture or flooring): Compliance with CARB ULEF or NAF requirements, or 50% of the European E1 formaldehyde class as tested per EN 717 or EN 16516.
8. For furniture: Compliance with ANSI/BIFMA e3-2014 or later version Furniture Sustainability Standard, Sections 7.6.2 or 7.6.3.



**CRADLE TO CRADLE CERTIFIED™
PRODUCT STANDARD
VERSION 4**

**VOLATILE ORGANIC COMPOUND (VOC)
CONTENT TESTING**

SECOND DRAFT FOR PUBLIC COMMENT

Demonstrating Low VOC Content

The VOC content related provisions of one of the following standards or an equivalent must be used to demonstrate low VOC content, as applicable:

1. For architectural coatings/wet-applied products:
 - a. South Coast Air Quality Management District (SCAQMD) Rule 1113 (June 3, 2011).
 - b. South Coast Air Quality Management District (SCAQMD) Rule 1168 (October 6, 2017).
 - c. European Decopaint Directive (2004/42/EC)
 - d. Free of solvents, as defined in TRGS 610 (January 2011)
2. Programs that are listed as acceptable for the VOC Content evaluation requirements, see the list "LEED v4 EQ Credit Low-Emitting Materials Third Party Certifications and Labels" - version of June 2017 or later
3. BREEAM International New Construction 2016 (or later) Technical Standard, section "Hea02", Table 19 "Maximum TVOC content for paints and coatings"
4. GEV classification criteria for Installation Products, Adhesives and Building Materials to award the EMICODE, sections 2.2 and 2.3
5. CARB Regulation for Reducing Volatile Organic Compound Emissions from Antiperspirants and Deodorants (Antiperspirants and Deodorants Regulation, 2015)
6. CARB Regulation for Reducing Emissions from Consumer Products (Consumer Products Regulation, 2015)
7. CARB Regulation for Reducing the Ozone Formed from Aerosol Coating Product Emissions (Aerosol Coating Products Regulation, 2015)
8. CARB Alternative Control Plan Regulation for Consumer Products and Aerosol Coating Products (Alternative Control Plan Regulation, 2015)
9. DGNB System 2018 (or later) ENV 1.2 Local and Environmental Impact, Appendix 1 Criteria Matrix at the following quality levels:
 - a. Decorative paints, primers etc. for floors (line 2): level 1, 2, 3, or 4.
 - b. Dust binding coatings etc. (line 3): level 1, 2, 3, or 4.
 - c. Wallpaper paste (line 4): level 1, 2, 3, or 4.
 - d. Coatings for exterior surfaces (line 5): level 1, 2, 3, or 4.
 - e. Installation materials (line 8): level 1, 2, 3, or 4.
 - f. Barrier coatings, seals, and screeds (line 9): level 1, 2, 3, or 4.
 - g. Stone flooring impregnations (line 10): level 4.
 - h. Polyurethane adhesives and silane modified polymers (line 11): level 1, 2, 3, or 4.
 - i. Facade adhesives (line 13): level 3 or 4.
 - j. Fire safety coatings for metal (line 15): level 2, 3, or 4.
 - k. Corrosion protection coatings of load-bearing metal components category C2 (line 16): level 2, 3, or 4.
 - l. Corrosion protection coatings of load-bearing metal components category C3 (line 17): level 1, 2, 3, or 4.

- m. Corrosion protection coatings of load-bearing metal components category higher than C3 (line 18): level 2, 3, or 4.
- n. Corrosion protection coatings of non-load-bearing metal components (line 19): level 2, 3, or 4.
- o. Polyurethane coatings (line 20): level 1, 2, 3, or 4.
- p. Wood coatings (line 21): level 3 or 4.
- q. Epoxy coatings (line 23): level 1, 2, 3, or 4.
- r. EP/PU primers (line 24): level 1, 2, 3, or 4.
- s. Wood oils and waxes (line 27): level 2, 3, or 4.
- t. PU system adhesives (line 46): level 2, 3, or 4.

One of the following test methods must be used to quantify VOC content:

- 1. ASTM D2369
- 2. ASTM D6886
- 3. SCAQMD method 304
- 4. SCAQMD method 313
- 5. CARB method 310
- 6. EPA method 24
- 7. ISO 11890-1
- 8. ISO 11890-2
- 9. Any testing method proven to be equivalent to any of the above.



**CRADLE TO CRADLE CERTIFIED™
PRODUCT STANDARD
VERSION 4**

**WATER & SOIL STEWARDSHIP
KEY MATERIALS**

SECOND DRAFT FOR PUBLIC COMMENT

Table 1 - Materials Typically Associated with Pollutant Intense and/or High Volume Water Use Processes.

High volume water use processes are those that typically require high volumes of water. Facilities, including supplier facilities where key materials are manufactured, that use (i.e. withdraw and/or purchase) $\geq 100,000$ cubic meters (m^3) of fresh water per year are considered high volume water users. [10] Any supplier of key material(s) carrying out the processes marked as 'high volume' below is considered to use a high volume of water unless water use data is provided that demonstrates otherwise.

Pollutant intense processes are defined as processes with high potential to negatively affect conventional water quality parameters such as biological oxygen demand (BOD), chemical oxygen demand (COD), and total suspended solids (TSS), and/or result in the release of hazardous chemicals with effluent or run-off. Pollutant intense processes are defined broadly to include soil erosion and loss which, in addition to resulting in reduced topsoil quality and availability on land, also contributes to poor surface water quality.

Material	Processes	High volume water use	Pollutant intense	
			Chemicals and effluent quality related	Soil erosion related
Cement	Slurry preparation, use of wet kiln instead of dry kiln process	✓	-	-
Ceramic tile	Wet process: milling	✓	-	-
Chemicals (i.e. the transformation of organic and inorganic raw materials by a chemical process to form products). Includes plastics (primary production)	Various processes including process cooling & heating, cleaning/rinsing, process water and sludge disposal, etc.	✓	✓	-
Crops: cotton, maize/corn, oil palm, soy, sugarcane [1]	Use of pesticides (insecticides, herbicides, fungicides, etc.) and fertilizers, associated chemical runoff to surface water.	-	✓	-
Crops: cotton, maize/corn, soy, sugarcane [2] [3] [4]	Irrigation	✓	-	-
Crops: oil palm. Soy and other crops if sourced from de facto high-risk countries	Deforestation and other unmanaged/poorly managed land conversion to agriculture and associated soil erosion and siltation of	-	-	✓

Material	Processes	High volume water use	Pollutant intense	
			Chemicals and effluent quality related	Soil erosion related
(as defined in for Social Fairness) [5]	surface water.			
Glass	Float process - cooling, washing recycled material	✓	-	-
Leather	All wet leather processing steps including curing, prepping, tanning and dyeing; waste handling.	✓	✓	-
Material sourced from grazing species/ungulates (leather, wool, etc.)	Deforestation and poor management resulting in soil erosion and runoff	-	-	✓
Metals (ferrous and non-ferrous)	Primary metal production processes: cleaning, cooling, etc.	✓	✓	-
Mined metal ores (includes iron, aluminum, nickel, copper, zinc and other ores. See reference [6] for full list.)	Hydraulic mining. Mine dewatering, acid and metalliferous drainage and tailings production, soil erosion and runoff (from surface mining), material separation and transport, etc. [7] extraction of valuable metals (silver and gold) using mercury and cyanide	✓	✓	✓
Mined minerals (includes stone, sand, gravel, gypsum, and clay. See reference [8] for full list.)	High volume: Mine dewatering (if necessary) - potential to lower the water table. Pollutant intense: soil erosion and runoff	possibly	-	✓
Metal finishes (includes chrome, galvanization, etc.)	Finishing/plating, rinsing/cleaning, rectifier cooling	✓	✓	-
Oil & gas	hydraulic fracturing/fracking, water injection/waterflooding [7]	✓	✓	-

Material	Processes	High volume water use	Pollutant intense	
			Chemicals and effluent quality related	Soil erosion related
Plastics (recycled)	Washing post-consumer plastic for recycling	✓	-	-
Pulp & paper (includes all cellulosic pulp e.g. pulp used to make textile fibers)	Debarking, pulping, pulp washing, pulp bleaching [9] Papermaking: Pulp dilution & dewatering	✓	✓	-
Semiconductors	Cleaning/rinsing with ultrapure water (UPW) and ultrapure water production, cooling	✓	✓	-
Textiles (includes fiber and yarn stages)	Wet processing including: scouring, bleaching and other wet pre-treatment steps, sizing and desizing woven textile materials, dyeing, finishing including denim finishing, washing, coatings	✓	✓	-
Wood/timber	Debarking (high volume), sawmill timber processing (pollutant intense)	✓	✓	-
	Deforestation, forest management (poor management resulting in soil erosion and runoff, use of pesticides and fertilizers).	-	✓	✓

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