

THE RECYCLED MATERIAL STANDARD

# Framework

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## About GreenBlue

GreenBlue is an environmental nonprofit dedicated to the sustainable use of materials in society. Our mission is to promote the principles of sustainable materials management — use wisely, eliminate toxicity, and recover more. Through our projects, we achieve our goal by influencing the debate, enhancing supply chain collaboration, and creating action. GreenBlue is the parent nonprofit to The Sustainable Packaging Coalition, How2Recycle, CleanGredients, Forests in Focus and other programs.

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NSF International, an independent, not-for-profit, non-governmental organization, is dedicated to being the leading global provider of public health and safety-based risk management solutions while serving the interests of all stakeholders.

## About The Standard

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## Table of Contents

1 General .....	1
2 Normative References .....	3
3 Terms and Definitions.....	3
4 Eligibility.....	4
5 Material Accounting .....	5
6 Chain of Custody.....	9
7 Certification.....	17
8 Attributes of Recycled Content (ARC) Certificate System.....	19
9 On-Product Labeling.....	22

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Unless otherwise referenced as normative, appendices are not considered an integral part of the Recycled Material Standard. They are provided as general guidelines to the manufacturer, regulatory agency, user, or certifying organization.

# 1 General

## 1.1 Introduction

GreenBlue's Recycled Material Standard (RMS) is a voluntary, market-based framework that enables consistent labeling of products and packaging that contain or support verified recycled material, either through a certified chain of custody or via the Attributes of Recycled Content (ARC) certificate trading system.

The RMS was developed by GreenBlue and NSF International to provide a rigorous and widely available scheme for consistent labeling of recycled material.

This document presents the RMS Framework, which provides the overarching guidelines for RMS certification for all materials. Additional requirements can be found in the RMS Material Modules which provide material-specific guidance and requirements. Only materials that are addressed by a material module shall be considered RMS-certified materials. The RMS Plastics Module is the first to be developed along with the overall Framework.

Hereafter, the use of "Standard" or "RMS" shall refer to this document, the RMS Framework.

The terms "shall" and "must" are used throughout this Standard to indicate mandatory requirements for conformance to this Standard; the terms "should" and "may" are used to indicate preferred and allowable actions, respectively. "Can" is used for statements of possibility and capability, whether material, physical or causal.

## 1.2 Purpose

The purpose of the RMS is to support the growth of the recycling industry and increased use of recycled material in product and packaging supply chains in order to realize the environmental benefits associated with decreased extraction of virgin natural resources.

The Standard intends to address challenges that participants in the recycling industry and value chain face in trying to incorporate higher levels of recycled content into products and packaging. The Standard does so by providing a consistent framework with flexible certification options that enable verified content claims, mass-based allocation claims, and certificate trading. Through establishment of a certificate trading system, the RMS also aims to encourage continued investment and advancement in recycling technology and infrastructure.

The requirements in this Standard are intended to be science-based, provide transparency, and offer credibility for manufacturers in making claims related to the use of recycled content in their product(s) and/or supply chain(s).

## 1.3 Scope

Entities located in North America are eligible for certification to the Standard.

**1.3.1** This Standard applies to entities who generate, reprocess, and/or purchase recycled material. The scope does not include raw material extraction (e.g. mining of metals or production of virgin plastic resin) or material disposal.

**1.3.2** This Standard is limited to the processing and use of recycled materials and does not include or reference life cycle attributes or other environmental considerations of material manufacturing processes, material or product performance, or health and safety considerations.

**1.3.3** This Standard is intended to not interfere with or supersede any applicable laws, regulations, or standards programs.

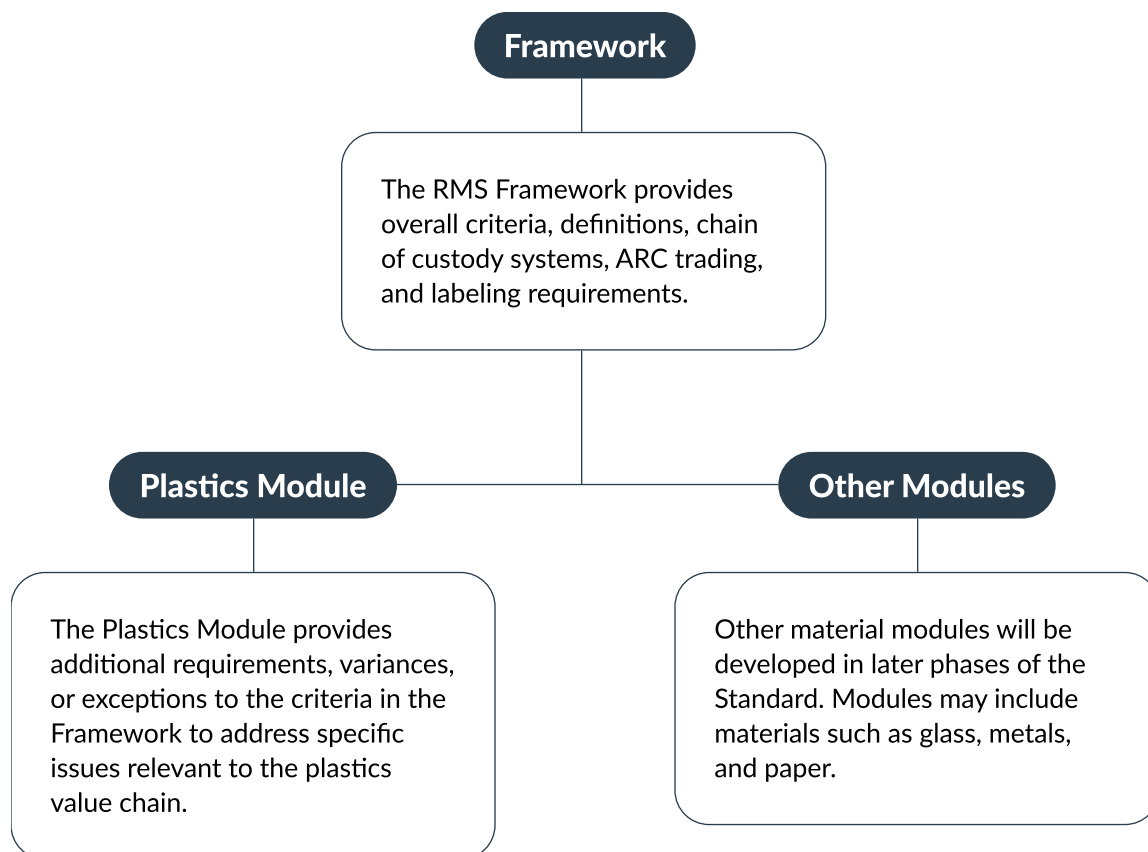
**1.4 Principles:** This Standard was developed in accordance with the following principles:

- ISEAL Credibility Principles: The ISEAL Credibility Principles of Sustainability, Improvement, Relevance, Rigor, Engagement, Impartiality, Transparency, Truthfulness, and Efficiency were used to guide development of the Standard.
- Scientific basis: The criteria contained in this Standard were developed and selected based on sound scientific and engineering principles intended to produce accurate, meaningful, and verifiable results.
- Innovation: Use of this Standard is intended to support, not inhibit, innovation that maintains or improves environmental performance of the materials recycling industry over time.
- International trade aspects: The procedures and requirements included within this Standard have not been prepared, adopted, or applied with the intention of creating unnecessary obstacles to international trade.

**1.5 Material modules:** The RMS applies to those materials used in end consumer and business-to-business products and packaging such as plastics, glass, metals, and paper. This Framework includes general requirements for all applicable materials. The RMS Material Modules provide additional requirements and examples for individual material groups.

A specific material type can only achieve certification once meeting the requirements of the RMS, and its applicable Material Module.

The Plastic Material Module is the first to be developed in conjunction with the launch of the RMS Framework. Ultimately, additional Modules will be created allowing certification of other material types to the RMS.



## 2 Normative References

The following documents contain requirements that, by reference in this text, constitute requirements of this Standard. At the time of publication, the indicated editions were valid. All documents are subject to revision and parties are encouraged to investigate the possibility of applying the recent editions of the documents indicated below. The most recent published edition of the document shall be used for undated references.

- ISEAL Alliance Credibility Principles, June 2013
- ISEAL Alliance Chain of custody models and definitions, September 2016
- ISO Standard 14021:2016 Environmental labels and declarations – Self-declared environmental claims (Type II environmental labeling)
- 16 C.F.R. Part 260: Guides for the Use of Environmental Marketing Claims, October 2012 (also known as the FTC Green Guides)
- GreenBlue Recycled Material Standard Good Practice Principles

## 3 Terms and Definitions

Within this Standard, the following terms shall be interpreted as defined here.

**3.1 Attribute of Recycled Content (ARC):** A tradable environmental commodity (certificate) representing the environmental attributes associated with producing one metric ton of recycled material.

**3.2 Base material:** Material that has been decoupled from a certified claim and used to generate ARC certificates.

**3.3 Functional unit:** The amount of recycled material used for the accounting of recycled material throughout the chain of custody and in the ARC system. In the ARC system, the functional unit is specified in the material module.

**3.4 Fuel:** Material that is consumed (i.e. burned or otherwise made to react) so that it releases energy as heat or work.

**3.5 Lower heating value:** Also known as the net calorific value or lower calorific value, the amount of heat released during combustion of a material, less the heat of vaporization of water.

**3.6 Material classification:** Assignment of the recycled status and material type of eligible material. For example, material may be classified as post-consumer recycled polypropylene.

**3.7 Material group:** The general family of material (e.g. plastic, glass, paper, or metal) applicable to the material being certified under RMS.

**3.8 Material Identification Code:** The letter-number combination that represents the material type and recycled status for the purpose of consistent classification for the RMS. Material ID Codes are provided in the Material Modules.

**3.9 Materials Recovery Facility (MRF):** A facility that sorts reclaimed materials into specific packaging categories.

**3.10 Material type:** The standard categorization to identify certified materials under RMS. Refers to the material category based on chemical, physical, or functional properties. Material types are further defined within each Material Module.

**3.11 Post-consumer material:** Material generated by households, or by institutional, commercial or industrial facilities as end-users of products, that can no longer be used for its intended purpose. This includes returns of materials from the distribution chain such as obsolete inventory or damaged goods.

**3.12 Post-industrial material:** Material diverted from the waste stream during a manufacturing process that cannot be reclaimed within the same process that generated it. Refer to the Material Modules for material-specific definitions.

**NOTE:** A manufacturing process is defined by a combination of equipment, operational settings, material specifications and formulation of materials. The same or similar equipment using different input materials is not considered the same process.

**3.13 Product group:** The set of similar products defined by each certified organization for the purposes of material accounting and certification.

**3.14 Reclaimed material:** Material that would have otherwise been disposed of as waste or used for energy recovery but has instead been collected and recovered [reclaimed] as a material input, in lieu of new primary material, for a recycling or a manufacturing process.

**3.15 Recycled content:** The proportion by mass of recycled material in a product, packaging or a specific component of either. Recycled content is expressed as a percentage and is calculated based on the primary material category as follows:

$$RC = 100 \times RM / (RM + VM)$$

Where RM = mass of recycled material; VM = mass of virgin material

**3.16 Recycled material:** Material that was diverted from the waste stream and has been collected, sorted and reprocessed and converted into a feedstock to be used in a product. Recycled material includes post-industrial and post-consumer sources.

**3.17 Recycled status:** The designation used to identify eligible RMS material and differentiate between qualified claims. RMS recycled statuses include: recycled, post-consumer recycled, and post-industrial recycled.

**3.18 Required participant:** Entity that is required to be audited and certified to RMS in order for material to carry RMS claims.

**3.19 RMS claim:** An RMS claim represents the information required on sales documents (such as invoices and delivery documents) that convey the amount of recycled material represented by the claim expressed as a percentage, the recycled status, and the control system designation. RMS claims are required to maintain chain of custody.

**3.20 RMS disclaimer:** An RMS disclaimer is required on sales documents at ARC generating facilities for base material sold without recycled content status.

**3.21 RMS on-product label:** An RMS on-product label is a graphic depiction supported by specific language that allows consumers to recognize and identify RMS-certified products in the marketplace. The use of labels is optional.

**3.22 Scrap:** A term used to describe recycled materials prior to re-processing. Within the context of the Recycled Material Standard scrap refers broadly to the recyclable inputs that are converted to recycled material outputs. May also be referred to as reclaimed materials.

**3.23 Value chain:** The framework for the transfer of material from generation through to end use. The value chain often includes entities such as processors, brokers, distributors, and brands.

**3.24 Value chain participant:** Any entity that participates in the movement or sale of material.

## 4 Eligibility

This section defines general eligibility requirements for certification. Additional requirements are specified in the Material Modules.

**4.1 Material requirements:** Material must be verified as recycled according to the definitions in this Framework, the relevant RMS Material Module, and RMS Material Classification.

**4.1.1** Material may be from post-consumer or post-industrial sources.

**4.1.2** Material sourced from illegal operations is not eligible for certification to RMS. Illegal operations are considered those without a current, valid, legal license to operate in their region.

**4.2 Organizational requirements:** Organizations intending to certify material under RMS must submit a signed commitment to uphold the GreenBlue Recycled Material Standard Good Practice Principles. Organizations suspected or found to be in violation of these Principles may be subject to suspension or revocation of certification.

**4.3 Exclusion of fuels:** Fuels are excluded from eligibility for certified status under the RMS. This includes but is not limited to:

- a) The re-use or re-processing of used oils, such as cooking or motor oil, into a usable fuel;
- b) The processing of materials into fuels, such as the generation of gaseous or liquid fuels through chemical means or pelletized solid fuels for incineration.

## 5 Material Accounting


This section provides requirements for classifying and accounting for materials within and between organizations to ensure transparency throughout the chain of custody and verify that claims are consistently documented and communicated.

In addition to the below criteria, eligible material must also meet requirements within the relevant Material Module where applicable.

Certified materials must be classified and documented throughout the chain of custody and when generating ARCs. Classification must include the recycled status and material type.

**5.1 Classification of recycled status:** All certified material shall be assigned a recycled status that accurately represents the nature of the material. Eligible material must at a minimum be assigned as Recycled ("R"). Where applicable, material may be further categorized as Post-Industrial ("PI") or Post-Consumer ("PC"). Post-Consumer is designated as the highest recycled status claim, followed by Post-Industrial, and Recycled as the least claim. The recycled status must be assigned and documented at the time eligible material is generated.

**Table 1: Recycled Status Definitions**

Hierarchy	Recycled Status	Definition
<div> <div>Highest</div> <div>  </div> <div>Least</div> </div>	Post-Consumer (PC)	Material generated by households, or by institutional, commercial or industrial facilities as end-users of products, that can no longer be used for its intended purpose. This includes returns of materials from the distribution chain such as obsolete inventory or damaged goods.
	Post-Industrial (PI)	Material diverted from the waste stream during a manufacturing process that cannot be reclaimed within the same process that generated it. May also be referred to as pre-consumer material. Refer to the Material Modules for material-specific definitions.
	Recycled (R)	Material that was diverted from the waste stream and has been collected, sorted and reprocessed and converted into a feedstock to be used in a product. Recycled material includes pre-consumer and post-consumer sources.



**5.2 Classification of material type:** Eligible material must be assigned a material type in alignment with the Material Classification System for the relevant Material Module. The material type must be assigned and documented at the time eligible material is generated.

**5.3 Product groups:** The organization shall define product groups for the purposes of certifying eligible material, based on products with like composition and characteristics. To be considered like composition, inputs to all products in the product group must be the same material type or combination of material types.

**5.3.1** The organization shall maintain records for each certified product group, including:

- Name of product group
- List of products included in the product group
- Material classification and RMS Material ID code(s) for input materials
- Material classification and RMS Material ID code(s) for output materials
- The control system (i.e. average content, mass balance, or ARCs) used for the product group

**5.3.2** The Material ID Code used to define certified product groups shall be assigned as follows:

[Recycled Status Code]\_[Material Group Code].[Material Type Code]

See Table 2, Example 1, and Example 2 below for guidance. Additional information is available in the RMS Material Modules and RMS Material Classifications.

**Table 2: RMS Material Identification Codes**

		ID Code
Recycled Status	Recycled	R
	Post-Industrial	PI
	Post-Consumer	PC
Material Group	Plastic	P
	Additional Material Groups to be added over time	Pending
Material Type	See Material Modules	Material-Specific

**Example 1: Assignment of Material Identification Codes**

Recycled Status	Material Group	Material Type	Material ID Code
Recycled	Plastic	Recovered PET	R_P1.1.6
Post-Industrial	Plastic	LDPE Resin	PI_P3.1.5
Post-Consumer	Plastic	Multimaterial Film	PC_P4.1.7

**5.3.3** Organizations shall maintain material accounting records for each product group. Annual material accounting summaries must be provided based on either fiscal or calendar year and must appropriately reflect the control system used for each product group.

**5.3.4** Multi-site certification participants shall follow consistent product group definitions and a control systems for all sites contributing to a certified product group.

**5.3.5** Certified organizations shall allow GreenBlue and certification bodies to publicize information in the RMS Certificate Database about their certified product groups (including the control system and material type) so that downstream participants and other stakeholders can verify which products are eligible to carry a certification claim.

**5.3.6** The organization shall ensure that certified material is not double counted across product groups.

#### Example 2: Defining Product Groups

A company manufactures several brands of retail grocery bags and can liners (trash bags) with various levels of recycled content. These are defined as one product group with the following characteristics.

Inputs	Outputs	Control System	Certified Brands
P3.1.5 Post-consumer and post-industrial polyethylene resins	P5.1.1 Polyethylene bags	Average content	Eco-liners, eco-retail bags

**5.4 System boundaries:** The organization shall define the system boundaries used for the site(s) and product group(s) within the intended scope of certification.

**5.4.1** System boundaries shall be defined based on the transfer of legal ownership or physical control of the certified material. Legal ownership is the preferred and predominant system in order to maintain chain of custody.

**5.4.2** System boundaries may be based on physical control for the case of RMS-certified contractors providing certified products for non-RMS-certified contracting organizations, if:

- The input material for the contract work is shipped directly from a certified supplier to the contractor; and
- The contractor is provided with documentation sufficient to link invoices and related transport records to the certified materials.

#### Example 3: Accounting System Boundaries

A non-certified beverage company purchases RMS-certified PET resin directly from a compounder and contracts a converter to make RMS-certified bottles. The resin is shipped directly from the compounder to the converter with accompanying documentation. In this case, because the beverage company never took possession and physical control was maintained, the chain of custody is valid.

**5.4.3** Outsourced activities may be included in the certified entity's system boundary if legal ownership does not change and outsourced activities are accurately represented in the certified entity's conversion factors and records.

**5.4.4** The following boundary definitions shall apply based on the scope of certification:

- Single-site certification: The boundary shall be defined where material enters or leaves the legal ownership or physical control of the certified facility.
- Multi-site certification: The boundary shall be defined where material enters or leaves the legal ownership or physical control of the certified organization. Material transferred between sites is considered to be within the same system.
- Group certification: The boundary shall be defined where material enters or leaves the legal ownership or physical control of group members. Certified material transferred between group members may be considered to be within the same system.

**5.5 Conversion factors:** Where a physical or chemical transformation process occurs within the system that results in a change in mass, composition, or material type of the certified material, the organization shall accurately document the transformation process and conversion factor based on, at minimum, the points at which the certified material enters and leaves the system boundary.

**5.5.1** Documentation of the processes shall include:

- a) Input value(s): The characteristics of the input material(s), including mass, material type, recycled status, and Material ID code.
- b) Transformation type: e.g. physical or chemical transformation.
- c) Process description: A brief description of the main processing steps in the transformation (i.e. how the material is modified).
- d) Conversion factor: The documented efficiency or yield of the transformation process based on mass of inputs and outputs, in the form of a percent. Conversion factors must be based on actual production data and must reflect system losses, uncertified by-products and any conversion to fuels.
- e) Justification: Documented rationale for the conversion factor applied.
- f) Output value(s): The final mass of the certified output material(s), including material type, recycled status, and Material ID code.

**Example 4: Conversion of Product Groups**



**5.5.2** Conversion factors and associated documentation must be kept up to date.

**5.5.3** Conversion factors must be applied to processes within a single control system.

**5.5.4** Conversion factors may not be applied to transitions between system boundaries.

**5.5.5** Conversion factors may not be applied across product groups.

### Example 5: Conversion Factor Documentation

Input Value(s)	1,000 lbs Recycled PET Resin / R_P3.1.6
Transformation Types	Physical
Process Description	Melting and formation into film
Conversion Factor	95%
Justification	Inventory / sales volumes
Output Value(s)	950 lbs Recycled PET film / R_P4.1.1

## 6 Chain of Custody

RMS certification is based on a continuous and transparent chain of custody of certified material. This section includes the requirements for maintaining and documenting control of certified materials.

### 6.1 Required Participants

**6.1.1** There must be an unbroken chain of certified organizations covering every change in legal ownership from the point of processing up to the point where the product is finished (and labeled if desired).

**6.1.2** In addition to organizations that process materials, certification is required for all organizations in the supply chain that have legal ownership and do any of the following activities:

- a) Change the composition of recycled materials (including mixing materials)
- b) Sell RMS-certified products with an RMS claim on a sales document
- c) Label a product as RMS-certified

### 6.2 Certified Sources

**6.2.1** The organization shall verify the supplier has valid certificate status (i.e. not expired, suspended or revoked) and that the product being purchased is within the supplier's scope of certification. This information can be obtained from the RMS Certification Database housed at [RMSCertified.com](https://RMSCertified.com).

**6.2.2** Verification of each supplier must be conducted at least annually.

### 6.3 Uncertified Sources of Reclaimed Material

**6.3.1** Reclaimed material shall enter the chain of custody with an uncertified status only when the conditions in this section are met.

**6.3.2** When purchasing from uncertified sources, buyers must ensure the eligibility of the input materials for the intended RMS claim through a due diligence system described in this section.

**6.3.3** Processors (also known as reclaimers) purchasing from uncertified sources must maintain a due diligence system that includes:

- a) Documentation of all non-certified suppliers comprising greater than 1% of annual inputs contributing to RMS claims, including the name of the supplier, type of entity and activities (i.e. MRF, trader), materials supplied, and quantities supplied.

- b) Documented risk assessment process used to evaluate uncertified suppliers. The risk assessment must include a determination of supplier risk level based on supplier activities and/or material types or amount sold.
- c) Documented process for validating the eligibility of purchased materials based on supplier risk level.
- d) Documented training of employees responsible for implementing the due diligence system.
- e) A contingency plan to address non-conforming material and/or documentation, and records of any non-conformances and corrective actions taken.

**6.4 Chain of custody control systems:** The chain of custody control systems under this Standard are defined in alignment with the ISEAL Alliance. Each control system supports specific certification claims and in turn, the claims are eligible for different on-product labels.

**6.4.1 Control system hierarchy:** Control systems follow a hierarchy that reflects the level of physical control within the value chain. Segregation has the highest level of control whereas multi-site mass balance has the lowest level of control. The hierarchy of control systems for RMS certification is organized as follows, from most to least robust:

- a) Segregation
- b) Average content (also known as batch-level mass balance)
- c) Average content (rolling average)
- d) Mass balance allocation (single-site)
- e) Mass balance allocation (multi-site)

**6.4.2** Each product group shall be managed using a consistent designated control system.

**6.4.3** A claim from a designated control system may be transferred to a 'lesser' (i.e. less robust) system as certified material moves through the value chain.

**6.4.3 Segregation control system:** The segregation control system maintains RMS-certified material from one or more sources physically separate from non-certified material of the same type throughout the supply chain.

**6.4.3.1** Incoming and outgoing claim types shall match or may be downgraded to a lesser claim.

#### Example 6: Segregation Control System

1. A stocking merchant buys and sells rolls of film with various certified content levels. If the merchant can maintain physical control of the materials, each roll is sold with the same claim that it was purchased with.
2. A plastic film carrying a 10% post-consumer content claim is converted into plastic bags. The film is physically segregated and never blended with other material. The bag can be sold with the same claim as the film.

**6.4.4 Average content control system:** The average content control system allows physical mixing of certified and uncertified material.

**6.4.4.1** RMS-certified and uncertified material may be mixed for a specific batch, lot, or other controlled quantity of product, over a specified period of time, if the quantities of incoming and outgoing certified material are known and controlled.

**6.4.4.2** Until the point of mixing, RMS-certified material shall be segregated from uncertified material.

#### 6.4.4.3 Average Content (Batch-Level)

- a) The batch-level average content control system is used to issue recycled content claims based on the known recycled percentage of a specific batch or production lot. The end product must contain a known mass of certified material.
- b) Each batch or production lot must be uniquely identified and documented.

**Example 7: Batch-Level Average Content Calculation**

A batch process mixes seven tons of RMS certified recycled material with three tons of virgin material, with uniform losses of 10%. The nine tons of product produced from this batch are eligible for a 70% average content claim.

**6.4.4.4 Average Content (Rolling Average)**

- a) The rolling average content control system is used to issue recycled content claims to product groups that are manufactured on a recurring basis (e.g. daily or weekly runs) throughout a defined time period.
- b) The rolling average percentage of certified material is calculated for each product group based on the known inputs and outputs, including losses, over the defined time period.
- c) The time period for the rolling average must be consistent and shall not exceed twelve months. There must be a regular and consistent reconciliation period for recalculation of the rolling average. For example, a rolling average may be based on a 12-month time period and recalculated every month.
- d) The rolling average content control system may be applied across multiple sites as long as each of the following conditions are met:
  - i) The percentage calculation is applied to common product groups manufactured at each site;
  - ii) Each site contributing to the calculation is included within the scope of the certificate;
  - iii) Each contributing site's individual rolling average is no less than 20% of the overall multi-site rolling average percentage claim.

### Example 8: Single-Site Rolling Average Content Calculation

A PET bottle producer is aiming to produce roughly 1,000 tons per month with a 15% recycled material claim using a 6-month rolling average. The table below shows their calculations of the rolling average content beginning in Period 1. From Periods 9 through 15, the 15% average content claim would be acceptable.

Period	Certified Recycled Input (tons)	Virgin Material Input (tons)	Monthly Average	Sum: Certified Material for Prior 6 Months (tons)	Sum: Virgin Material for Prior 6 Months (tons)	6-Month Rolling Average
1	110	900	10.9%	110	900	10.9%
2	120	900	11.8%	230	1,800	11.3%
3	130	900	12.6%	360	2,700	11.8%
4	140	900	13.5%	500	3,600	12.2%
5	150	900	14.3%	650	4,500	12.6%
6	160	900	15.1%	810	5,400	13.0%
7	170	900	15.9%	870	5,400	13.9%
8	170	880	16.2%	920	5,380	14.6%
9	170	880	16.2%	960	5,360	15.2%
10	170	870	16.3%	990	5,330	15.7%
11	170	850	16.7%	1,010	5,280	16.1%
12	160	850	15.8%	1,010	5,230	16.2%
13	150	840	15.2%	990	5,170	16.1%
14	150	850	15.0%	970	5,140	15.9%
15	140	860	14.0%	940	5,120	15.5%

#### Example 9: Multi-Site Rolling Average Content Calculation (1)

Three locations manufacture the same product group using a rolling average content control.

- Site 1 manufactures 1,000 tons with a rolling average content of 35% (C = 350, T = 1,000)
- Site 2 manufactures 1,000 tons with a rolling average content of 30% (C = 300, T = 1,000)
- Site 3 manufactures 500 tons with a rolling average content of 50% (C = 250, T=500)

For the entire product group: C = 900, T= 2,500; Average content =  $900 / 2,500 = 36\%$

All products from these sites for this product group may carry a claim of 36% average content.

#### Example 10: Multi-Site Rolling Average Content Calculation (2)

Three locations within a company manufacture the same product group.

- Site 1 manufactures 1,000 tons with a rolling average content of 40% (C= 400, T=1,000)
- Site 2 manufactures 1,000 tons with a rolling average content of 35% (C=350, T=1,000)
- Site 3 manufactures 500 tons with a rolling average content of 5% (C=25, T=500)

Across the three locations: C=775, T=2,500; Average content =  $775 / 2,500 = 31\%$ .

In this case, because Site 3's average content of 5% is less than 20% of the overall rolling average, Site 3 does not meet the contribution threshold, their products cannot contribute to a multi-site rolling average claim of 31%.

**6.4.5 Mass balance control system:** The mass balance allocation control system may be used to issue mass-based allocation of claims within a product group.

**6.4.5.1** Mass balance allocation of claims must be based on known quantities of inputs and outputs, including losses, over a defined time period.

**6.4.5.2** The time period for reconciling allocation of claims must be consistent and shall not exceed three months.

**6.4.5.3** Mass balance allocation must be supported by a material accounting system that tracks the amount of certified inputs and outputs over the defined time period.

**6.4.5.4** Mass balance allocation is not permitted between product groups.

**6.4.5.5** Material contributing to mass balance allocation claims shall not be accumulated for more than 24 months.

**6.4.5.6** The accumulated balance of materials shall not exceed the amount of inputs accumulated over the prior 24 months.

#### Example 11: Mass Balance Allocation

Allowed: If 10 tons of product within Product Group A contain 30% RMS certified content, 3 tons may be sold as 100% RMS Certified Sourcing while the remaining 7 tons carry no certification claim.

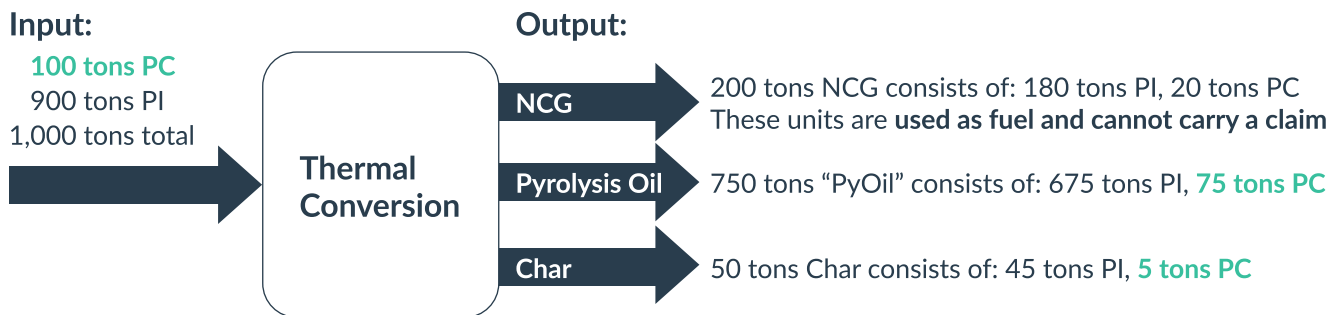


**6.4.5.7** For systems generating co-products, the certified material should be attributed to the outputs (and losses) in the same mass ratio that the co-products are produced. This approach is known as proportional allocation. However participants may apply non-proportional allocation as further defined in Material Modules. In all cases, any proportion consumed or sold as fuel must be treated as a loss and must not be allocated to a product.

#### Example 12: Proportional Allocation

A chemical recycling facility converts mixed olefins (polyethylene and polypropylene) through a thermal conversion process and generates three co-products at the following mass ratio: 20% non-condensable gas, 75% pyrolysis oil and 5% solid char.

The process is fed 900 tons of post-industrial (PI) materials and 100 tons of post-consumer (PC) materials. The input units with recycled status are allocated proportionally to the outputs as shown below: 20% to NCG, 75% to pyrolysis oil and 5% to char. Because the non-condensable gas (NCG) is consumed as fuels to generate energy for the plant, that material is treated as a loss from the system. In this example, the facility is able to sell 75 tons of pyrolysis oil as post-consumer material.



**6.4.5.8 Mass balance allocation (single-site):** The site-level mass balance control system allows a single site, plant, or facility to allocate RMS claims based on the amount of certified material that passes through the plant over the defined reconciliation period.

#### Example 13: Single-Site Mass Balance Allocation

Converter X sources plastic film from two suppliers. Supplier A provides 100% RMS-certified product and Supplier B provides virgin product. Over a period of 12 months, Converter X sources 25% of all film from Supplier A and 75% from Supplier B.

Converter X may 1) claim all plastic film in that period as 25% certified based on mass balance; or 2) claim 25% of material as 100% certified based on mass balance and assign no claim to the remaining 75%.

**6.4.5.9 Mass balance allocation (multi-site):** The multi-site mass balance chain of custody model allows facilities under common ownership to allocate RMS claims based on the amount of certified material that passes through the organization over a defined reconciliation period.

- The organization must document the quantities of certified and non-certified material that transfer in or out through the ownership boundary.
- A site that issues claims on a product must contribute at least 10% of the input to claims made by that site.
- Multi-site mass balance allocation is not permitted between members of certification Groups.

#### Example 14: Multi-Site Mass Balance Allocation

A company operates three chemical recycling facilities under a multi-site certificate with a shared mass balance material accounting system. Sites A, B and C process post-consumer and post-industrial mixed plastics into an intermediate (oil) that is further processed into plastic products. Over a twelve month period each site generates 12,000 tons per year as follows:

- Site A: 1,000 tons post-consumer, 11,000 tons post-industrial
- Site B: 3,000 tons post-consumer, 9,000 tons post-industrial
- Site C: 8,000 tons post-consumer, 4,000 tons post-industrial

Site A may claim as much as 10,000 tons of post-consumer material.

**6.5 Chain of Custody Claims:** Certified material must be assigned either an average content or mass balance allocation claim, based on the control system utilized.

**6.5.1** The claim shall be displayed on sales documents accompanying the physical material.

**6.5.2** Claims must be expressed as a percentage rounded to the nearest whole number.

**6.5.3** Organizations must employ a consistent rounding convention that does not artificially inflate claims.

**6.5.4** Claims may designate the recycled status (post-consumer or post-industrial). If the recycled status is not designated in the claim, it defaults to the lesser status 'recycled'.

**6.5.5** If recycled status is designated, the claim must include the corresponding percentage of each designation.

**6.5.6** Certified material assigned a higher claim may be downgraded to a lesser claim category in accordance with the control system hierarchy. Lesser claims may not be transferred to a higher claim category.

**6.5.7 Average content claims:** Average content claims are based on either a batch-level or rolling average percentage.

**6.5.7.1** The percentage claim for average content is calculated as:

% certified =  $C/T \times 100$ ; where

C = RMS-certified mass of material category

T = total mass of material category

**6.5.7.2** Rolling average content claims must be made based on the most recent reconciliation period.

**6.5.8** Mass balance allocation claims are based on either a site-level or multi-site allocation of claims, represented as a percentage.

**6.5.8.1** The percentage claim for mass balance is calculated as:

% certified =  $M/T \times 100$ ; where

M = Mass of material category with an allocated RMS claim

T = total mass of material category

**6.5.8.2** Material that has been assigned a claim based on mass balance allocation must be maintained as a mass balance claim in downstream transactions.

**6.5.9 Claim Syntax:** RMS claims must be made in a consistent manner on sales documents according to the syntax described in this section and shall include the control system and percentage claimed. Claims may include a recycled status designation. Refer to Table 3 for example syntax.

**6.5.9.1** Each claim must be made in the following consistent order:

- a) RMS
- b) Percentage designation – total claim
- c) Percentage designation – post-consumer claim (optional)
- d) Recycled status designation (optional)
- e) Control system designation

**6.5.9.2** If a blend of post-consumer and post-industrial materials is used, the specific quantity of post-consumer may be designated. The order of the claim must be maintained as %total / %post-consumer.

**6.5.9.3** The control system used to support the claim must be designated in the following claim syntax:

**Table 3: Control System Claim Syntax**

Control System	Claim Syntax
Average Content	AC
Mass balance allocation	MB

**Table 4: Example Claim Syntax**

Example Syntax	Represents
RMS 40% PC AC	40% post-consumer material supported by an average content control system
RMS 90% PI AC	90% post-industrial material supported by an average content control system
RMS 50% / 10% PC MB	50% recycled including 10% post-consumer material supported by mass balance allocation control system
RMS 100% PC MB	100% post-consumer material supported by mass balance allocation control system

**6.6 Chain of custody documentation:** Participants shall maintain the relevant documentation needed to verify conformance with the RMS and the claim associated with the certified material. Relevant documentation may include records such as purchase and sales transactions, production and shipping records, equipment specifications, or material testing results.

**6.6.1** Documentation used for certification to RMS shall be retained by the participant for a minimum of 5 years.

**6.6.2** Participants shall maintain records of incoming and outgoing certified material for each product group. Records must include the material type, recycled status, associated certification claims, transaction date, and the mass of certified material and any fillers or non-certified parts.

**6.6.3** Records shall demonstrate a balance between incoming and outgoing claimed material. Where an imbalance occurs, the organization shall provide adequate rationale.

**6.6.4** Material accounting and claims records must be supported by:

- a) Supplier lists, including name of supplier, certification status, and material supplied;
- b) Contractor lists for any third party handling certified materials through an outsourced activity;
- c) Purchase records, including mass of material, recycled status, and certification claim(s) where applicable;
- d) Bill of materials for product groups using the content claim control system;
- e) Sales records; and Shipping/receiving records.

**6.6.5** Sales documents used to support RMS claims must contain the seller's RMS certification number issued by the certification body.

**6.6.6** If a sales or shipping document represents more than one item or product, RMS certification claims must be clearly and accurately represented for each item.

## 7 Certification

This section details the RMS certification process including audit schedules and documentation requirements for certification.

**7.1 Certification scope:** Participants must indicate the desired scope of certification, including product group(s), activities (i.e. sorting, reprocessing, converting), facility scope (single or multi-site), and chain of custody control system(s) intended to be included in certification. The certified scope will be listed on the participant's RMS certificate and in the RMS Certificate Database.

**7.1.1 Single-site certification** Single-site certification covers an individual facility or location. Facilities with multiple buildings may be defined as single-site if they share a physical address. Facilities covered under single-site certification are considered independent even if multiple certified facilities are owned or operated by the same entity.

**7.1.2 Multi-site certification:** Multi-site certification is available for an organization with legal ownership of multiple facilities that will be certified under one RMS certificate.

**7.1.3 Group certification:** Group certification is offered so that small business entities are not prohibited from participation due to a lack of resources and may participate in RMS as a group, with certification and conformance managed under a single certificate and certification manager.

**7.1.3.1** The threshold for defining a "small business entity" is defined within each material module.

**7.1.3.2** The RMS Group certificate will be issued with the name of the group entity and list all group members.

**7.2 Certification audit:** Participating organizations must work with an accredited Certification Body (CB) in order to achieve certification to the RMS.

**7.2.1** Certification includes an annual audit to verify conformance with the RMS and to maintain a valid RMS Certificate. The annual audit may be on-site or conducted remotely if it is a document review only. Refer to the audit schedule below for the audit requirements based on certificate scope.

**7.2.2** The participating organization must provide adequate access to documentation and facilities for auditors to verify conformance with the Standard.

**7.2.3** Auditors will review the relevant operations, documentation, and management systems necessary to verify conformance with the standard. This may include but is not limited to processing or production equipment, sales transactions, shipping records, processes or procedures, or material testing results.

**7.2.4** Facilities that manufacture or process certified materials must undergo an on-site visit upon initial certification and at least every three years thereafter.

**7.2.5** Entities that simply pass on claims without any material transformation may conduct initial certification and subsequent audits remotely.

**7.2.6** For multi-site and group certificates, key elements of the central management system will be reviewed annually. The number of individual sites to be included will be determined by the certification body using the risk-based sampling methodology outlined below.

**7.2.7** Every location within a group or multi-site certification must be audited at least once within a three-year audit cycle.

**7.2.8** If the management system is in good standing with no outstanding non-conformances, additional sites may be added to either multi-site or group certificates between audits. The certification manager will be responsible to contact their certification body to update the RMS certificate database prior to issuing any chain of custody claims from new sites.

**7.3 Risk-based sampling methodology:** The audited operation's risk level is determined by the certification body based on the results of the previous audit cycle and any changes that occurred within the operation. Risk levels are assigned based on the guidelines in Table 5 below.

**7.3.1** Initial audit cycles use the "medium risk" sampling approach.

**Table 5: Guidelines for Determining Audit Risk Level**

Risk Level	Description
Low	Average of 1 or fewer non-conformances during onsite audit. No changes to management or management systems.
Medium	Average of 1-3 non-conformances during onsite audit. Corrective actions have been delivered in a timely manner. No changes to management or management systems.
High	Average of more than 3 non-conformances during on-site audit. Repeat non-conformances. Significant changes to operations, management, or management systems. Significant changes include: <ul style="list-style-type: none"> <li>Change in sample size (i.e. number of facilities or group members) by greater than <b>25%</b> from previous audit cycle.</li> <li>Occurrence of a trigger audit as determined by policies of the certification body conducting the audit.</li> </ul>

**7.3.2** Audit sample size is determined by the risk evaluation during the previous audit cycle. Sample size is based on a factor of N, where N equals the number of facilities (for multi-site certification) or group members (for group certification) within the audit scope.

- Baseline / "Medium risk" operations:  $\sqrt{N} + 1$ , rounded up to the nearest whole number
- "Low risk" operations:  $0.7 \cdot (\sqrt{N} + 1)$ , rounded up to the nearest whole number
- "High risk" operations:  $1.3 \cdot (\sqrt{N} + 1)$ , rounded up to the nearest whole number

**7.4 Management system:** Participating organizations must have a management system in place to maintain and demonstrate conformance with the RMS. This includes policies and procedures related to the production, transfer, or modification of RMS-certified material, and the segregation of claimed material from non-certified material if applicable. Many elements of the RMS management system can be derived from day to day operating procedures, however some aspects are unique to conformance with the RMS.

**7.4.1 RMS management system records shall include:**

- Identification of the RMS certification manager: The organization shall identify at least one company representative who has responsibility for conformity to the RMS standard.
- Identification of the party ultimately responsible for conformity: The organization shall identify who reviews the performance with conformance with the RMS standard.

- c) Defined scope of certificate: The organization shall clearly identify the scope of the certificate including: identification and description of the operations and/or facilities covered by the certificate; the product groups included; and the control mechanism and conversion factors for each product group.
- d) Procedures and work instructions: The operation is expected to have documented procedures for maintaining adequate chain of custody, including procedures for activities such as receiving materials, issuing claims on sales documents, managing outsourcing activities, RMS label usage, and corrective actions.
- e) Defined support roles and responsibilities: The organization shall define and identify key representatives responsible for procedures.
- f) Training records of responsible parties: The organization shall be able to demonstrate adequate training of responsible parties. Such records may include training materials, attendance records, competency reviews, or similar documentation.
- g) Internal audit findings: The organization shall conduct internal audits to monitor conformance with the RMS. Findings must be recorded and shared with the certification body during annual conformance audits.
- h) Records of complaints and corrective actions: The organization must ensure that any complaints received related to conformity of the RMS are addressed in a timely manner. At a minimum the organization shall:
  - i) Acknowledge receipt of complaint to the complaining party within two weeks of receipt.
  - ii) Investigate the complaint, develop a corrective action plan, and notify the complaining party of proposed actions within three months.
  - iii) Report all complaints and corrective actions to the certification body during the annual conformance audit.

**7.4.2 Control of non-conforming products:** The organization must ensure that any non-conforming products are identified and controlled to prevent unintended sale or delivery with an RMS claim. Non-conforming products include products that are assigned an inaccurate claim or a claim that is not supported by the control system in place. In the event a non-conforming product has been sold and delivered, the organization must:

- a) Notify the affected customer and certification body within five business days of discovery; and
- b) Investigate the non-conformance, develop a corrective action plan, and implement measures to avoid recurrence.

#### Example 15: Non-Conforming Products

The following are examples of non-conforming products that would require corrective actions:

- A claim is made on a product that is not covered in the scope of the certificate.
- A sales document reflects the wrong percentage amount, control system or recycled status.
- A label is applied on a product that does not have adequate chain of custody.

## 8 Attributes of Recycled Content (ARC) Certificate System

This section outlines the requirements for certificate trading (also known as a book and claim model) to support the use of recycled material. This trading system uses certificates referred to as Attributes of Recycled Content (ARC certificates) or simply ARCs. ARC trading occurs separately from the chain of custody required for certified RMS materials.

**8.1 Participant eligibility:** All organizations certified through the RMS chain of custody are eligible to participate in the ARC system. However, certification is not required except as defined below.

**8.1.1** Uncertified organizations may purchase and trade ARCs if they meet the eligibility requirements in this section. Uncertified organizations are not eligible to generate ARCs.

**8.1.2** All organizations participating in the ARC system must submit a valid application to the GreenBlue RMS Program and comply with the GreenBlue Good Practice Principles.

**8.1.3** All organizations must register with the designated registry(s) and maintain current and accurate information.

**8.1.4** Operations wishing to generate ARCs must hold a valid and current RMS certificate covering the appropriate scope of activities. Operations may choose to both manage a chain of custody control system and generate ARCs for eligible materials.

**8.2 Additionality requirements:** The RMS ARC system is designed to drive necessary investment into recycling infrastructure and generate positive movement towards increased recycling capacity, efficiency, and quality. ARCs are intended to be a mechanism to support critical stages of the recycling process (i.e. processors) in generating additional benefit through enhanced recycling technology and markets.

In order to ensure that ARC investments are being directed to driving this positive change, processors wishing to engage in ARC generation must demonstrate that the generation of ARCs from their facilities is “additional”, i.e. beyond business-as-usual. Additionality requirements for ARC generation are described in the Material Modules.

**8.3 ARC generation:** ARCs may be generated only by processors recycling reclaimed inputs. ARCs may be generated from chemical or mechanical recycling.

**8.3.1** ARCs are generated from RMS-certified recycled material, by decoupling the claim from the physical material. The decoupled material is then referred to as “base material”.

**8.3.2** ARC certificates are based on a functional unit of one metric ton of recycled material.

**8.3.3** The base material must be sold or otherwise physically consumed (e.g. further processed or modified without changing ownership) within the supply chain to serve as a basis for ARCs.

**8.3.4** ARC certificates shall be generated only once for the same recycled material.

**8.3.5** Recycled material may not be double counted in support of an RMS claim. It is allowable to allocate a portion of sold goods to generate ARCs.

**8.3.6** When base material is sold, the ARC generator shall notify customers that the material carries no RMS claims and cannot be publicly claimed as recycled material.

#### Example 16: Generating ARCs

A certified reprocessor meets the ARC eligibility criteria. They produce 10,000 tons of 100% postconsumer polypropylene (PP) resin using a mass balance control system. They sell 10,000 metric tons of resin to customers with a 75% mass balance claim and register 2,500 metric tons of PP ARCs. The total amount of certified material was equal to the amount claimed and material was not double counted.

**8.4 ARC classification:** ARCs must be classified at the time of generation according to recycled status, material group and ARC type in accordance with the relevant Material Module.

**8.4.1** If the recycled material is comprised of mixed components that can be accurately distinguished and documented through mass-based accounting, separate ARCs may be generated to represent each component. The quantity of ARCs generated shall accurately reflect the mass of each component based on documented conversion factors.

**8.4.2** If the recycled material is comprised of mixed components that are unknown and/or cannot be accurately documented through mass-based accounting, the appropriate “Other” ARC type must be used.

**8.4.5 ARC recycled status:** ARCs shall be assigned a recycled status that accurately represents the nature of the base material. Eligible base material must at a minimum be assigned as Recycled (R). Where applicable, material may be further categorized as Post-Industrial (PI) or Post-Consumer (PC). Post-Consumer is designated as the greatest (highest) recycled status claim, followed by Post-Industrial, and Recycled as the least claim.



- 8.4.5.1** Where the recycled material contains both post-consumer and post-industrial material, either:
- Separate PI- and PC- ARC Certificates may be generated based on the respective mass of each component in the base material, provided the mass is known and documented; or
  - A lesser recycled status may be used.

#### Example 17: ARC Classification

Recycled Status	Material Group	ARC Type	ARC ID Code
Recycled	Plastic	Acrylonitrile Butadiene Styrene (ABS)	R_P_ABS_ARC
Post-Industrial	Plastic	Acrylic (poly methyl methacrylate) (ACR)	PI_P_ACR_ARC
Post-Consumer	Plastic	Nylon (polyamide)	PC_P_PA_ARC

**8.5 Loss of eligibility:** An ARC generator's eligibility is revoked upon expiration or suspension of their RMS Certificate. Previously generated unsold ARCs are considered saleable but no additional ARCs may be generated until the certification is reinstated.

**8.5.1** If eligibility is lost due to the additionality requirements, previously generated ARCs remain active but no additional ARCs may be generated.

**8.6 Certificate registration:** ARC certificates are tracked by registering the ARCs on the appropriate registry.

**8.6.1** ARC certificates must be registered with complete and accurate information. Any inaccuracies must be corrected by the certificate holder and reported to the certifying body.

**8.6.2** ARC generators must register certificates on an annual basis, at minimum. ARCs must be registered no later than one year after the base material was processed into its saleable form.

**8.6.3** ARC generation is only allowed after a valid RMS certificate is issued.

**8.6.4** Participants must maintain accurate records of the sale or consumption of base materials that support ARC generation.

**8.6.5** Once ARCs are retired, the user must register the retirement and maintain accurate records of ARC retirement date and reconciliation of claims made, if applicable.

**8.7 Certificate trading:** All ARC transactions must take place and be documented through the appropriate registry.

**8.7.1** The purchaser of the ARCs assumes legal ownership of the certificates and any associated claims. The purchaser may re-trade or retire the ARCs.

**8.7.2** The owner of the ARC certificates must maintain eligibility in order for owned ARCs to remain active and eligible for trading or use. If the certificate owner's RMS eligibility expires, ARCs are rendered inactive until eligibility is renewed.

**8.7.3** ARCs may be traded between entities until they are retired or until the use period expires, at which time they are removed from the system and shall not be re-traded.



**8.8 Retiring certificates:** Certificates must be retired on the appropriate ARC registry(s) in conjunction with label approval (if applicable) or prior to making any other public ARC claims.

**8.8.1** Once certificates are retired, the retire date will be recorded in the ARC registry and must be reconciled with the claim date.

**8.8.2** Once certificates are retired in the registry they shall not be re-traded.

**8.8.3** ARCs must be retired within the generation year or subsequent calendar year. For example, if an ARC is generated in 2021 it must be retired by the end of calendar year 2022.

**8.9 ARC claims:** Certificates must be retired in order for ARC purchasers to make any RMS claims. ARC claims must accurately reflect the ARCs being retired.

**8.9.1** ARCs may be used to support product-level claims (e.g. on-product labeling) or general claims, such as those made on a website or marketing materials or to fulfill corporate commitments.

**8.9.2** If ARC certificates are used for product-level claims, the ARC(s) retired must represent the same material type as contained in the product. When the product consists of mixed material types the user may retire multiple ARCs of different types, provided that the allocation can be justified based on the product composition. Refer to the Material Modules for additional requirements.

#### Example 18: General ARC Claims

A company manufactures liquid soap and used 25,000 metric tons of high density polyethylene (HDPE) bottles as their primary package in calendar year 2020. They purchase 6,250 PC\_PE ARCs, retire the certificates and in their 2020 sustainability report make a claim indicating, "We support investments in recycling technology. In 2020, we purchased ARCs equivalent to 25% of our primary packaging."

## 9 On-Product Labeling

The requirements in this section apply to on-product labeling associated with certified material.

**9.1 General:** On-product labeling is permitted in accordance with the RMS Labeling Guidelines. Labels must be approved by the appropriate oversight body according to those Guidelines.

**9.1.1** Labels must be supported by product claims verified through the appropriate chain of custody control system and/or the retirement of ARC certificates.