The Recycled Material Standard

Paper Module

August 11, 2026

recycled material STANDARD

A Project of greenblue

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About GreenBlue

GreenBlue is an environmental nonprofit on a mission to accelerate the transition to a regenerative, just, and sustainable materials economy. GreenBlue is the parent nonprofit of several projects, including the Sustainable Packaging Coalition, How2Recycle, and the Recycled Material Standard. Through these projects and their hundreds of members, GreenBlue strives to be the most reliable and accurate source of truth compelling the packaging value chain to construct environmentally regenerative, socially responsible systems. Learn more at **greenblue.org**.

About the Recycled Material Standard

The Recycled Material Standard (RMS) is a universal third-party certification that ensures materials are verified, traceable, and scalable for real-world adoption. Developed by GreenBlue, RMS is rooted in cross-industry collaboration, connecting stakeholders across the value chain to champion certification beyond compliance and drive real, lasting impact. RMS equips brands and suppliers with the clarity to meet regulatory demands and, by aligning businesses and recyclers under one trusted system, strengthens sustainability toward a more transparent recycled materials market. Learn more at **rmscertified.com**.

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About This Module

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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

The Recycled Material Standard (RMS) Framework provides the core set of criteria for chain of custody certification to the RMS for any material sector. The Material Modules supplement the Framework with additional material-specific definitions, criteria and examples.

The terms “shall” and “must” are used throughout this Module 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 Scope

This Module applies to paper-based material intended to be certified to the Recycled Material Standard. The requirements contained in this Module shall be considered binding and necessary for RMS certification of paper-based materials. Any requirement in a Material Module supersedes rules set forth in the Framework.

Paper-based material includes products wholly or partially consisting of fibrous plant-based materials. While wood is the primary source of fiber for paper, there are additional sources such as hemp, cotton, bamboo, wheat straw, and bagasse (derived from sugar cane waste).

Throughout this module we use the term “paper” as an umbrella term for paper, paperboard and molded pulp products, as they are all similar in composition but do vary in end market use. Paper products are often made on a paper machine, whereas molded pulp products use similar materials but are formed in a different manner.

2. Terms and Definitions

For the purposes of this Standard, the terms and definitions given in the RMS Framework Definitions and the following apply:

2.1 **Broke** is waste generated during the paper making process. Broke is further classified as wet broke or dry broke. Because broke is generated during the process and is not a finished product, it is not a source of reclaimed paper or recycled fiber. Broke is typically reclaimed within the papermaking process.

NOTE: While paper machine broke is not considered recycled material, if the recycled content of broke is known, it may be included in recycled content calculations. (See Example 9.)

2.2 **Consumption factor** is a specific type of conversion factor that may be used in chain of custody accounting that represents an intermediate step in a complex process, e.g., one that makes intermediate or semi-finished products. For example, an integrated pulp and paper mill may use a conversion factor to represent the transformation of recovered paper to recycled fiber and then apply a consumption factor that represents how much recycled material is attributed to a paper product.

2.3 **Conversion factor** represents the amount of output from the input that results, expressed as a decimal fraction or percentage. It is often thought of as the yield of a process after accounting for losses.

2.4 **Converting** is the process of transforming paper into semi-finished or finished products or components. Common converting processes include cutting, sheeting, printing, laminating, embossing, folding, and glueing.

2.5 **Credit** is a representation of the mass of recycled material available for attribution to an output. The terms "credit" and "mass balance credit" are used interchangeably but should not be confused with a credit used in a book and claim system. A book and claim credit is also referred to as a "certificate" or a "transferrable instrument with entitlement to a claim" (TEIC).

2.6 **Dry broke** is generated at the dry end of a paper machine (after dryers and other finishing steps such as coating and calendaring).

2.7 **Fiber** is plant-based (cellulosic) strands that, when interwoven and bonded together, form the structure of paper. Paper fiber is most commonly derived from wood, but may also include cotton, hemp, bamboo, and agricultural by-products such as bagasse from sugarcane and wheat straw. The terms fiber and pulp are often used interchangeably.

NOTE: Fiber derived from agricultural by-products does not count as post-industrial fiber; material such as wheat straw or bagasse is considered a raw material.

2.8 **Input material** is material or a product with recycled status entering the system boundary of a certified entity.

2.9 **Molded fiber** is a three-dimensional product manufactured by bonding fibers together in a mold. Molded fiber products are commonly used for protective packaging purposes and in food service ware.

2.10 **Output material** is material or a product that leaves the system boundary or results from a process within the system boundary.

NOTE: Output material may be formed and consumed within a system boundary for multi-step or integrated processes. For example, recycled fiber may be produced from scrap and then consumed and used to form paper or paperboard with recycled content.

2.11 **Paper** is a lightweight material composed primarily of cellulosic fiber and often used for printing or wrapping other materials. Paper includes a wide range of products including tissue and towel grades.

2.12 **Paperboard** is a heavier, rigid grade of paper often used for packaging.

2.13 **Post-consumer fiber** is fiber derived from post-consumer paper sources or other fiber sources (such as textiles).

2.14 **Post-consumer paper** is paper, paperboard or molded fiber generated by households or by institutional, commercial or industrial facilities as end users of products that can no longer be used for their intended purpose. This includes returns of materials from the distribution chain such as obsolete inventory or damaged goods.

NOTE: Returns of materials from the distribution chain such as obsolete inventory or damaged goods must be at the point in the supply chain where they were intended for use by the end user in order to qualify as post-consumer material.

See Annex I for further explanation and examples.

2.15 **Post-industrial fiber** is derived from post-industrial paper or other sources (such as plant-based textiles).

2.16 **Post-industrial paper** is generated after completion of the papermaking process; specifically, those operations that occur after the finishing stages including obsolete inventory or returns from the supply chain prior to the point where it was intended for use by the end user. Post industrial paper may also be referred to as "pre-consumer" paper.

See Annex II for further explanation and examples.

2.17 **Pulp** is the fibrous material used as the primary raw material for making paper, paperboard, and molded pulp products. The terms pulp and fiber are often used interchangeably.

2.18 **Recovered paper** is paper that has been diverted from the waste stream but not yet processed into a new feedstock (also commonly referred to as scrap paper). Recovered paper may come from post-industrial and post-consumer sources.

2.19 **Recycled fiber** is 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; i.e., it has been repulped. Recycled fiber includes post-industrial and post-consumer fiber.

2.20 **System boundary** is a set of criteria that defines the processes and locations from which chain of custody claims are being issued.

2.21 **Technically feasible** means that there is an existing means to obtain the output(s) from the input(s) within the system boundary.

2.22 **Wet broke** is generated at the wet end of a paper machine (forming and pressing) and has a high moisture content which makes it easy to repulp as the fibers are not bonded. Wet broke typically flows directly to a broke-pit or broke-pulper within the paper mill.

3. Group Certification

Companies that qualify as "small business entities" and meet the requirements in this section are eligible for pursuing RMS Certification as a group with certification managed by a group leader.

3.1 Companies should be classified as small business entities in accordance with regional definitions. Absent a clear definition, companies may use the following criteria:

a. Manufacturing companies with less than 500 employees
b. Non-manufacturing companies with less than $7.5 million in annual receipts

3.2 Participants in groups must perform similar types of operations; e.g., in the same position in the supply chain or conducting similar process steps.

> **Example 1:** Company A picks up mixed paper collected in bins at various retail locations. Company B picks up mixed paper from multi-family buildings. Both companies are conducting similar operations and could be certified within a group.

3.3 More than one site from the same company may participate in a group as long as their combined staffing and/or revenue does not exceed the eligibility requirements.

4. Chain of Custody Details

In all cases, an RMS claim represents the information required on sales documents (such as invoices and delivery documents) that conveys the amount of recycled material represented by the claim expressed as a percentage, the recycled status, and the chain of custody method (also referred to as the "control system"). See Section 5 for further details on claim syntax.

4.1 For the paper sector, participants should also clarify whether a claim is based on the total weight of the product (expressed as % recycled content) or if the claim is based on the weight of fiber (expressed as % recycled fiber).

4.2 All calculations should be based on dry weights.

4.3 Segregation Method
The segregation method maintains RMS-certified materials from one or more sources physically separate from non-certified materials of the same type. Incoming and outgoing claim types shall match or may be downgraded to a lesser claim.

4.3.1 The segregated material must be clearly identifiable as it passes through a manufacturing process, or during transport and storage.

4.3.2 In cases where materials are transformed (e.g., cut or printed), a conversion factor shall be calculated and byproducts and losses shall be accounted for. If there is no transformation and no losses from the system (e.g., sold through a distributor) then the conversion factor = 1.0.

> **Example 2:** A tissue converting facility converts large rolls of tissue into smaller rolls for sale as a consumer product. For every 1,000 tons of tissue converted, the facility generates 30 tons of slitter dust, 40 tons of scrap tissue and 930 tons of finished product. The facility has defined scrap as a certified output. In this case the dust is the primary source of loss and the conversion factors (CF) may be reported as:
>
> CF (scrap) = 0.04
>
> CF (rolls) = 0.93

4.3.3 The segregation method does not allow for recalculating recycled content or allocating credits. However, if two or more certified materials are combined by a participant using the segregation method, the output product can carry the lesser claim per the RMS hierarchy for recycled status, control methods, or percentage claim.

> **Example 3:** A converting facility laminates two paperboard substrates that are both RMS certified. One substrate is 100% recycled content and the other is 70% recycled content. Under the segregation system, the output product can be labeled as 70% recycled content as this is the lesser claim.

> **Example 4:** A distributor routinely receives rolls of paper with a 70% mass balance claim from multiple suppliers. They also occasionally receive a batch of the same type of paper with a 75% mass balance claim. The converter chooses to co-mingle the 75% materials with the 70% materials and downgrade the claim to 70% on outgoing products.

4.3.4 Under the segregation method, claims based on recycled fiber (as opposed to the full weight of the product) may not be co-mingled, even with downgrading, because there is a need to conduct calculations based on fiber weight to determine the lesser claim.

4.4 Controlled Blending Method

The RMS Framework uses the term “average content” to represent the controlled blending method. Within the paper module, we are hereby replacing the term “average content" with “controlled blending.” This change also serves to clearly differentiate this approach from the rolling average method.

It is important to note that paper and paperboard products often include non-fiber materials (e.g., fillers and coatings). In some cases, non-fiber materials are also recycled and may contribute to the mass of recycled material in a new product.

The RMS allows two approaches to making controlled blending calculations. The first approach, referred to as recycled content, uses the full mass of the product as the basis of the calculation (the denominator). The second approach, referred to as recycled fiber, uses the mass of fiber in the product as the basis of the calculation. In both cases, the resulting calculation represents material that is physically present in the product carrying the claim.

4.4.1 Only RMS certified materials are counted toward the recycled portion of the claims.

4.4.2 When using the controlled blending method, the recycled content is calculated as:

RC = 100 x RM/(RM + VM), where:
RC = recycled content expressed as a single percentage
RM = mass of certified recycled material
VM = mass of virgin material (including non-certified material)

> **Example 5:** A tissue mill makes a grade of bathroom tissue that is composed of 90% fiber, and the remaining 10% of the mass of paper is composed of additives (e.g., fillers, wet strength resins). For a 1,000-ton batch of this product, the mill uses 900 tons of fiber and 100 tons of additives. The fiber blend includes 200 tons of RMS-certified post-consumer fiber, 250 tons of RMS-certified post-industrial fiber and 450 tons of virgin fiber. For simplicity in this example, losses are assumed to be zero.
>
> RC = 100 x (200+250)/(200+250+450+100) = 45% recycled content.

4.4.3 If a calculation is based on fiber portion, the percentage of recycled fiber (RF) is calculated as:

RF = 100 x RF/(RF + VF), where:
RF = recycled fiber expressed as a single percentage
RF = mass of certified recycled fiber
VF = mass of virgin fiber (including any non-certified fiber)

> **Example 6:** A papermill makes a grade of coated paper that is composed of 70% fiber, and the remaining 30% of the mass of paper is fillers and coatings. For a 500-ton batch of this product, the mill uses 350 tons of fiber and 150 tons of fillers and coatings. The fiber blend includes 70 tons of RMS-certified post-consumer recycled fiber and 280 tons of virgin fiber. For simplicity in this example, losses are presumed to be zero.
>
> RF = 100 x 70/ (70+280) = 20% recycled fiber

The preferred method for making calculations is to use the total mass of the product. However, it is recognized that the paper sector routinely makes calculations based solely on the fiber portion of paper. Both calculations are allowed.

4.4.4 The basis of calculation for a given product group must be consistent and must be used for both post-consumer and post-industrial materials when applicable.

4.4.5 When combining substrates with different certified content, a weighted average formula may be used.

Weighted average = $(W_1X_1 + W_2X_2 + W_3X_3 + \ldots + W_iX_i + \ldots W_nX_n)/ (W_1 + W_2 + W_3 + \ldots + W_i + \ldots W_n)$

Where: W = mass of input, and X = certified content of input expressed in decimal format, e.g., 35% = 0.35

$$Weighted\ Average\ = \frac{\sum_{i=1}^{n}(W_n \times X_n)}{\sum_{i=1}^{n} W_n}$$

Example 7: Weighted Average Using Recycled Content Claims
A converter makes corrugated containers by combining linerboard, with corrugating medium.

They make a batch of the combined board using 200 tons of linerboard that has a 25% recycled content and 100 tons of corrugated medium with 100% recycled content. The process results in 270 tons of output combined board and 30 tons of scrap; the scrap and output product contain the same proportions of material from each input.

The weighted average recycled content is calculated as:
RC = 100 x ((200 x 0.25) + (100 x 1)) / (200+100) = 50%

4.4.6 When using the weighted average formula, the basis of the calculations must be known; otherwise, applying a fiber-based claim to the full weight of the product will overstate the contribution of recycled materials.

4.4.7 The fiber composition (% by weight) can be determined by either:

a. Requesting the information from the supplier,
b. Testing the paper to determine the fiber portion, or
c. using a default composition based on the product type, as specified in 4.4.8.

NOTE: Information on fiber composition provided by a supplier or test lab should be documented for auditing purposes, e.g., in the form of a certificate of analysis (CoA).

4.4.8 If applying a default composition, the following must be used:

- For coated printing and writing papers: 50% fiber
- For all other grades of paper and paperboard: 70% fiber
- For molded fiber products: 85% fiber

Example 8: Weighted Average Using Fiber Based Claims
A converter combines three paper types with recycled fiber claims as listed below to make high-quality in-store standing displays. The decorative graphics are printed on coated paper which is then mounted as a face stock to corrugated medium and a kraft liner backing (making a double face corrugated board). The supplier of the corrugating medium and kraft liner has provided data indicating the fiber composition; however, the fiber portion of the coated paper is unknown, and the converter applies the default composition to calculate the weighted average composition of the combined materials. For simplicity, in this example losses are presumed to be zero.

Component	Amount Used	% Fiber Composition	Mass of Fiber Portion	Recycled Fiber Claim	Mass of Recycled Fiber
Coated Paper	3,500 kg	50% (default)	1,750 kg	10%	175 kg
Medium	3,00kg	90%	2,700	80%	2,160 kg
Kraft Liner	3,500 kg	95%	3,325 kg	20%	665 kg
Total	**10,000 kg**		**7,775 kg**		**3,000 kg**

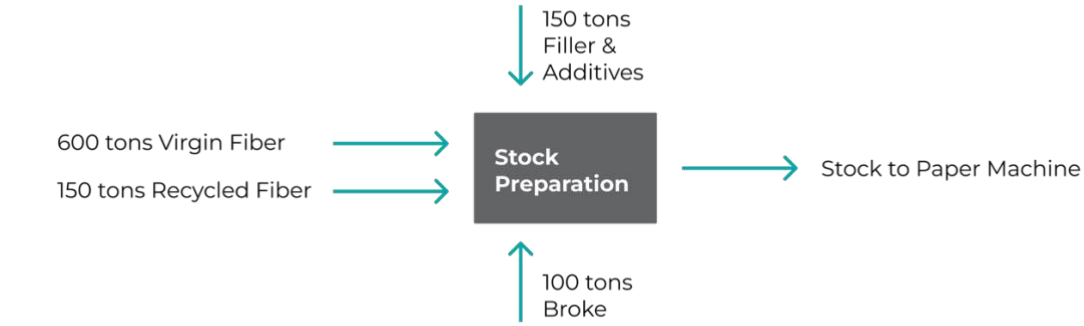
The converter calculates a percentage-based claim on the fiber portion of the corrugated board, as shown below:

Recycled Fiber: RF = 100 x 3,000/7,775 = 38.6%

Broke is generated in a paper mill at different rates depending on a variety of factors. Some broke are constantly generated (e.g., wet edge trim), while other sources are intermittent (e.g., from a web break during a run).

4.4.9 The recycled portion of broke may be included in a calculation.

Example 9: Accounting for Recycled Content in Papermaking Broke
A paper company schedules their production runs to ramp up and down between various levels of recycled content. The machine is known to experience more web breaks on higher recycled content and generates more broke. When they have amassed high levels of broke, they make a grade of copy paper using 10% broke. The broke is known to have 30% recycled content and includes 10% fillers and additives as it was generated in the prior run.



Broke composition: 30% Recycled Fiber, 60% Virgin Fiber, 10% Fillers and Additives

Applying the known composition to the broke shows that 100 tons of broke (based on dry weight) contains:

30 tons recycled fiber, 60 tons virgin fiber, and 10 tons of fillers and additives.

The mill uses both the total weight and weight of fiber to calculate the recycled content (RC) and recycled fiber (RF) as shown below.

Recycled Content: RC = 100 x (150+30)/1,000 = 18%

Recycled Fiber: RF = 100 x (150+30)/(150+30+600+60) = 21.4%

4.5 Rolling Average Method

The RMS program allows participants to make recycled material calculations using a rolling average method, where the average is updated continuously. This approach generates an average based on controlled blending calculations. While not as precise as a single batch calculation, the resulting calculations reflect current, ongoing operating performance (vs. prior year or other historical averages). This approach can help smooth out fluctuations between batches and offers some flexibility to manufacturing locations. The variability of data contributing to the average must remain within a reasonable range as described below.

4.5.1 The rolling average method can be applied to either recycled content (using the full mass of the product) or recycled fiber (using only the fiber portion for the basis of calculation).

4.5.2 When using the rolling average method, the number of data points (N) to be included in the average may be time based (e.g., a set number of hours of production time on a paper machine) or based on a rolling number of production batches (e.g., 10 batches).

4.5.3 At a minimum, there must be at least five data points contributing to the rolling average.

4.5.4 Once the number of data points (N) is specified for a product group, it must be maintained, unless modified as specified in 4.5.12.

4.5.5 Claims cannot be issued until the rolling average has been calculated using N data points.

4.5.6 The recycled content of a batch or period that contributes to the rolling average may never be zero. Zero content batches or periods should be segregated and may not carry a rolling average claim. (NOTE: zero content batches may be assigned a mass balance credit claim under a different product group.)

4.5.7 When using a rolling average, calculations shall also be made to determine the coefficient of variation (CV) for the data set.
CV = standard deviation / mean

4.5.8 To demonstrate that the variability is low and the resulting average is valid to support claims, the CV must be less than 20%.

4.5.9 The total time span for the rolling average shall not exceed twelve months (regardless of the units chosen).

Example 10: Rolling Average Recycled Fiber at a Tissue Mill

A tissue mill makes a single grade of toilet paper on an ongoing basis with a targeted average of 50% recycled fiber. Paper machine runs vary in length and their inputs of recycled fiber vary in composition with different levels of post-consumer and post-industrial content. The mill uses a five-run rolling average (N=5) as illustrated in the table below.

In this example, the amount of recycled fiber for runs 7, 10 and 11 falls below 50% (shaded in blue). However, the rolling average always remains above 50%, and the coefficient of variation (CV) remains under 20% for each period.

Production Run ID #	Mass of Post-Industrial Fiber	Mass of Post-Consumer Fiber	Total Mass Recycled Fiber	Mass of Virgin Fiber	Total Mass of Fiber	Recycled Fiber of Run	**5 Run Rolling Average Recycled Fiber**	5 Run Rolling Average Post-Consumer	5 Run Rolling Average Post Industrial	5 Run RC Standard Deviation (SD)	**5 Run RC Coeffient Variation (CV)**
1	80	75	155	145	300	51.7%					
2	105	75	180	170	350	51.4%					
3	200	75	275	225	500	55.0%					
4	120	75	195	180	375	52.0%					
5	80	75	155	170	325	47.7%	**51.9%**	20.3%	31.6%	2.6%	**5.4%**
6	155	75	230	220	450	51.1%	**51.8%**	18.8%	33.0%	2.6%	**5.1%**
7	45	75	120	130	250	48.0%	**51.3%**	19.7%	31.6%	3.0%	**6.3%**
8	75	75	150	140	290	51.7%	**50.3%**	22.2%	28.1%	2.1%	**4.0%**
9	235	75	310	165	475	65.3%	**53.9%**	20.9%	33.0%	7.2%	**11.1%**
10	70	75	145	150	295	49.2%	**54.3%**	21.3%	33.0%	7.0%	**14.2%**
11	85	75	160	165	325	49.2%	**54.1%**	22.9%	31.2%	7.2%	**14.6%**
12	225	75	300	150	450	66.7%	**58.0%**	20.4%	37.6%	8.8%	**13.2%**

As noted previously, broke is generated in a paper mill at different rates depending on a variety of factors. Due to the complexity of paper mill operations, it is often not possible to segregate various batches of broke.

4.5.10 Paper mills may use a rolling average calculation for tracking broke composition.

4.5.11 If using a rolling average for broke composition, zero content runs may be included, and the rule regarding coefficient of variation does not apply for broke.

4.5.12 If a participant using the rolling average method is in good standing with no outstanding non-conformances, the participant may make modifications to its rolling average calculation method, including basis of data points (time-based or production batch-based), number of data points. The certification manager must notify the participant's certification body and must have the minimum number of data points as specified in 4.5.5 using the modified calculation method prior to issuing chain of custody claims based on the modified calculation method.

4.6 Mass Balance Credit Method

The mass balance credit method accurately accounts for the amount of certified materials received, processed, and sold by certified participants. While the amount of material physically present in a given item may not be known, the manufacturer making the claim must demonstrate that the market they serve (as a whole) is receiving the recycled material that is claimed. Claims are allocated when outputs are placed in inventory or sold, and are based on credits derived from the volume of recycled material received and processed (after accounting for losses).

4.6.1 Only participants that receive and process recovered paper or pulp derived from recovered materials may use the mass balance credit method.

4.6.2 The boundary for defining product groups that use mass balance calculations may not go further down the supply chain than the papermaking process; i.e., companies may not include converting steps even if integrated).

4.6.3 The mass balance credit method may be applied to molded pulp operations.

4.6.4 Mass balance credits may be added to the credit account upon receipt of input materials or at the point of transformation.

4.6.5 Credits shall be deducted (or consumed) from the account either at the point when the process is complete and the outputs are placed in inventory, or at the point of sale.

4.6.6 The time period for accounting reconciliation (credit balancing) should not vary once established. Shorter time periods are preferred (e.g., daily) and may not exceed three months.

4.6.7 A credit-based claim may not be issued if there are not sufficient credits available in the accounting system. In other words, credits may not be "borrowed" from the future, and the balance shall not be below zero at the end of the balancing period.

4.6.8 Companies may choose the mass units that best suit their operations (e.g., air-dried metric tons, bone dry US tons, etc.). Credits should also be identified by type (e.g., a recovered paper credit, pulp credit or paper credit) and by status (post-consumer, post-industrial or recycled).

4.6.9 Credits shall only be attributed to the output (or portion of the output) that is similar in nature to the input material and may not be allocated in an amount that exceeds the mass of that material in a product.

Example 11 A manufacturer makes a coated paper product that contains 65% fiber. For a 100-ton batch of product, they could apply pulp (fiber) credits equivalent to 65 tons (100% recycled fiber or 65% recycled content) but may not use pulp credits that exceed that level.

4.6.10 Credits may be removed from outputs and placed back into the credit balance in two situations:

a. Credits were assigned to inventory that was not sold
b. Sold goods were returned to the manufacturer

4.6.11 Credits may not be returned to the account if they were assigned more than two years prior to the return.

4.6.12 If multi-site mass balance allocation is used, any site that issues claims on a product must contribute at least 10% of the credits to the output claims made by that site.

4.6.13 If co-products are formed, the credits must be allocated to co-products using proportional allocation.

Example 12: Mass Balance Credit Method Applied at a Paper Mill
An integrated facility receives three different types of post-consumer recovered paper and processes it to make post-consumer recycled pulp. The facility makes fluting materials and linerboard from recycled materials. The remainder of the pulp consumed is derived from post-industrial sources.

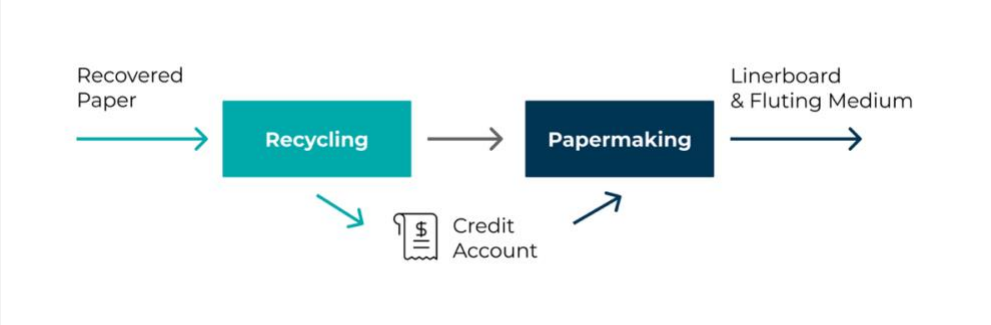


Figure 1: Mass balance credit system model for Example 12

For accounting purposes, they establish a mass balance credit system based on dry tons of post-consumer pulp. The different recovered paper grades each have their own conversion factor for converting paper to pulp tons.

They produce three different grades of paper using mass balance claims with either 50% or 100% post-consumer fiber status. Each grade is composed of 90% fiber (10% fillers and additives) so their consumption factors for 50% and 100% fiber-based claims are 0.45 and 0.9, respectively.

Credit balances are reconciled on a daily basis.

The table below shows two days of production records including summaries of materials received and materials produced by type on each day.

Production Date	Input Type	Received Amount (recovered paper)	Conversion Factor (recovered paper to pulp)	Input Credits *	Produced Goods Type	Amount of Produced Goods (paper)	Consumption Factor (pulp to paper)	Consumed Credits *	Credit Balance *
	Carry Over Balance								**350.0**
1-Jan	OCC - Commercial	200	0.95	**190.0**					540.0
1-Jan	OCC - Residential	200	0.90	**180.0**					720.0
1-Jan	Mixed Paper	200	0.75	**150.0**					870.0
1-Jan					MB 50 Liner	300	0.45	135	735.0
1-Jan					MB 100 Medium	300	0.90	270	**465.0**
2-Jan	OCC - Commerical	250	0.95	**237.5**					702.5
2-Jan	Mixed Paper	325	0.75	**243.8**					946.3
2-Jan					MB 50 Liner	50	0.45	22.5	923.8
2-Jan					MB 100 Medium	250	0.90	225	698.8
2-Jan					MB 100 Liner	300	0.90	270	**428.8**

* Note: all credits are expressed at bone dry tons with post consumer status

The mill has been operating a mass balance system and starts the year with a credit balance from the prior period. The data illustrates how each receipt of material adds to the credit balance and how each product deducts from the credit balance using different conversion factors. On the first day, the mill produced more credits than it consumed. On the second day they consumed more credits than they produced; however, the balance is reconciled daily and shows a positive credit balance.

5. Paper Material 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 amount claimed (as a percentage) and the claim type. Claims may also include a recycled status designation (post-consumer, post-industrial, or simply recycled). Claims should also include the basis of the calculation (fiber only or total product weight). Clear syntax is core to the chain of custody documentation and also serves to inform which types of on-product labels may be used (if applicable). See Annex III for further explanation of claim types supported by each control system.

5.1 Each RMS claim must be made in the following order:

a. Three letters representing the certification program: RMS
b. Numeric percentage designation representing the amount of the claim
c. Numeric percentage designation representing the amount of post-consumer material claimed and the basis of the calculation
d. Recycled status designation and basis of the calculation, using the syntax indicated below:

Recycled Status and Basis of Calculation	Claim Syntax
Post Consumer Content	PCC
Post Consumer Fiber	PCF
Post Industrial Content	PIC
Post Industrial Fiber	PIF
Recycled Content	RC
Recycled Fiber	RF

e. Two letters indicating an Average Content claim type when the rolling average method has been employed: AC

f. Two letters indicating a Mass Balance claim type when the mass balance method has been employed: MB

5.2 The numeric percentage designation representing the amount of post-consumer material claimed *(item c above)* is optional and may be used when only a portion of the total claim has post-consumer status. If excluded, the claim will default to the numeric percentage and recycled status indicated in items *b* and *d*.

5.3 The recycled status designation *(item d above)* is optional, but if excluded, the claim will default to "recycled" and cannot be upgraded.

5.4 The basis of the calculation is optional *(item d above)*, but if excluded, the claim will default to a fiber-based claim for any downstream claims, labels or calculations.

5.5 The letters AC must be included (*item e above*) if either an input claim was based on rolling average, or if the participant employs the rolling average method to generate a new claim.

5.6 The letters MB must be included *(item f above)* if either an input claim was based on mass balance, or if the participant employs the mass balance method to generate a new claim.

Example 13: Claim Syntax

Claim Syntax	Represents
RMS 100% PCC	100% post-consumer content
RMS 40% PIF	40% post-industrial fiber
RMS 50%/10%PCC MB	50% recycled content including 10% post-consumer material supported by the mass balance credit method
RMS 100%/40%PCF	100% recycled fiber including 40% post-consumer fiber
RMS 100% RF MB	100% recycled fiber supported by the mass balance credit method

6. Paper Material Classification

6.1 For the purposes of certification and chain of custody in accordance with the RMS, all paper-based materials shall be classified according to the categories presented in the Recycled Material Standard Paper Material Classification.

6.2 Paper-based materials shall be assigned the appropriate material type based on the relevant Level 3 category. Participants should refer to the RMS website for the most current version of the Recycled Material Standard Paper Material Classification.

6.3 When classifying materials, participants are encouraged to follow guidelines for allowable contamination and prohibited materials as designated by industry standards.

7. Product Groups and Conversion Factors

Product groups are used to help organize information used to issue RMS claims. They also help the auditors ensure that volume tracking and claims are accurate. Product groups are defined by several pieces of information.

7.1 Each product group designation must include:

a. Input material types(s)
b. Output material type(s)
c. Conversion factor(s)
d. Chain of custody method employed

7.2 The input and output material types should be matched to RMS Material Classifications. The output material is also used for public listing in the RMS Certificate Database.

7.3 The output material is the material that carries the claim to the next point in the supply chain (e.g., sold goods) or the next process within the participant's system boundary.

7.4 All product group designations must be technically feasible.

7.5 If multi-site mass balance accounting is used, it must be technically feasible to make the output product at each location sharing a product group designation.

Conversion factors are used to account for and document the flows of recycled material through recycling and manufacturing processes based on yield, as described in the RMS Framework Section 5.5. This section provides additional criteria and supplemental examples for paper.

7.6 If a segregation system is used without any physical transformation of the product, and there are no losses of inventory, the conversion factor shall be defined as 1.0 (or 100%).

7.7 Conversion factors may be used to cover multiple steps within a process.

7.8 Companies may use consumption factors to assign credits to different outputs from a credit account. For example, applying recycled claims at different levels to similar outputs or when applying a similar claim to a material with a different fiber composition.

7.9 The amount of credits that need to be consumed to support a claim is determined in the same manner as a controlled blending calculation. These calculations can be based on the total mass of the product including fillers and coatings, or based on the fiber content only. The basis of the calculation must be reflected in the claim syntax as described in Section 5.1.

7.10 A product group may include multiple conversion factors.

> **Example 14:** A paperboard manufacturer adopts the mass balance chain of custody method. They use two sources of scrap to make recycled fiber: mixed paper and old corrugated containers. They measure the conversion of each scrap type and define their product group as follows:
>
> a. Inputs: mixed paper (F0.1.2) and old corrugated containers (F1.1.3)
> b. Output: Pulp; not-deinked (F1.1.2)
> c. Conversion factors: mixed paper to pulp = 0.70, OCC to pulp = 0.90
> d. Chain of Custody Method: Mass Balance

7.11 If a single conversion factor is used, it shall be based on a weighted average of the conversion factors for all products in the group.

Example 15: A paperboard manufacturer adopts the mass balance chain of custody method. They use two sources of scrap to make recycled fiber: mixed paper and old corrugated containers. They measure the conversion of each scrap type and define their product group as follows:

a. Inputs: Mixed paper (F0.1.2), OCC (F1.1.3)
b. Output: Pulp; not-deinked (F1.1.2)
c. Conversion factor: 0.8
d. Chain of custody method: Mass Balance

7.12 Organizations shall maintain material accounting records for each product group. Material accounting summaries must appropriately reflect the chain of custody method and conversion factor(s) used for each product group.

7.13 Organizations may choose to use more than one chain of custody method for similar products. Each product group must be defined and included in the scope of the certificate.

Example 16: Multiple Chain of Custody Methods Applied at a Paper Mill
A paper company opts to use three chain of custody methods to produce outgoing products with post-consumer material claims at different levels. All of the RMS-certified inputs (different pulp sources) are physically segregated (held in different storage areas) within the stock preparation area of the mill.

The paper mill receives a portion of inputs from a supplier with the claim RMS PCC 100% MB. Some of this material is used as-is to make paperboard with the RMS 100% PC MB claim.

The paper mill also blends a portion of the 100% PC mass balance material with virgin pulp and assigns claims to make 30% recycled status paperboard with the claim RMS 30% PCC MB.

The paper mill also receives certified pulp from another supplier that provides the material with the claim RMS 100% PCC. The converter blends this pulp with virgin materials to generate three different average content claims at 10%, 30%, and 50% content.

The table below illustrates a summary of the different product groups described above.

Name of Product Group	Certified Input: Material ID and Claim	Conversion Factor	Certified Output	Chain of Custody Method
MB100	F1.1.2 Pulp, not deinked RMS 100% PCC MB	1.0	F3.2.1 Linerboard RMS 100% PCC MB	Segregation
MB30	F1.1.2 Pulp, not deinked RMS 100% PCC MB	0.3	F3.2.1 Linerboard RMS 30%PCC MB	Mass Balance
RC10	F1.1.2 Pulp, not deinked RMS 100% PCC	0.1	F3.2.1 Linerboard RMS 10% PCC	Controlled Blending
RC30	F1.1.2 Pulp, not deinked RMS 100% PCC	0.3	F3.2.1 Linerboard RMS 30% PCC	Controlled Blending
RC50	F1.1.2 Pulp, not deinked RMS 100% PCC	0.5	F3.2.1 Linerboard RMS 50% PCC	Controlled Blending

Annex I: Post-Consumer Paper Guidelines

Post-consumer paper: Paper, paperboard or molded fiber 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.

There are many paper-based materials that are recovered from households which may otherwise end up in landfills along with other municipal waste. However, materials collected through municipal recycling programs from households are not the only source of post-consumer paper.

In addition to households, businesses and institutions are consumers of paper products for a wide variety of reasons. When paper has met its intended use by these entities, it is considered post-consumer material.

Post-consumer paper may also include returns of material from the distribution chain such as obsolete inventory or damaged goods. To qualify as post-consumer within the RMS program, material must be at the point in the supply chain where it was intended for use by the end user.

Household examples:

- **Printed materials** including newspapers, magazines, catalogs, and direct mail
- **Shipping materials** including envelopes, void fill, corrugated cartons, and molded fiber inserts
- **Food service ware** including cups, cup sleeves, clamshells, plates, and drink carriers
- **Packaging** including folding cartons (boxes), trays, tissue/towel cores, and berry punnets

Institutional, commercial or industrial (ICI) examples:

- A **warehouse** receives bulk shipments of small parts in corrugated containers. They unpack the parts and re-package them in smaller boxes. The corrugated container and void fill received by the warehouse are post-consumer paper.
- A **printing facility** receives rolls of paper wound on paper-based cores. After printing the paper, the remaining core is post-consumer paper.
- A **bakery** receives flour in multi-wall paper sacks. The used sacks are considered post-consumer paper.
- An **office building** uses high speed copiers and desktop printers. All paper printed at the office is post-consumer paper.

Returns from the supply chain:

- A **quick serve restaurant** has a storeroom full of unused paper products (bags, napkins, tray liners, clamshells, etc.) that are damaged by smoke and water after a kitchen fire. The materials are collected and sent to a recycler. These materials are post-consumer because they were at the point in the supply chain for use by a consumer.
- A **bookstore** has magazines and newspapers that are past their sales date. The magazines and newspapers are collected and sent to a recycler. These printed materials are post-consumer because they were at the point in the supply chain for use by a consumer.

Annex II: Post-Industrial Paper Guidelines

Post-industrial paper: Paper or paperboard generated after completion of the papermaking production process; specifically, those operations that occur after the product is in a form suitable for sale including obsolete inventory or returns from the supply chain prior to the point where it was intended for use by the end user.

NOTE 1: Post industrial paper may also be referred to as “pre-consumer” paper or “post-industrial fiber”.

NOTE 2: Paper machine broke is not considered recycled fiber; however, if the recycled content of broke is known, it may be included in recycled content calculations.

NOTE 3: Material generated in a converting process counts as post-industrial material, regardless of the physical location of that process (i.e., it may be co-located with the facility that recycles paper).

NOTE 4: Paper often undergoes finishing steps to convert a reel or parent roll to a saleable product (typically in the form of a finished roll of paper which has been wrapped for shipment to a customer). In a case where converting is co-located, the paper need not be sold or wrapped prior to converting in order to generate post-industrial scrap.

NOTE 5: If the post-consumer status of a source of post-industrial scrap is known, that claim can be passed forward with the recovered paper.

Examples:

- A tissue manufacturer converts large (e.g., one ton) rolls with multiple steps including rewinding onto small cores, perforating, embossing and wrapping. Fiber generated at any point in the tissue converting process is considered post-industrial.
- A distributor has a warehouse that experiences a roof leak. A large quantity of paper-based service ware (cups, plates, and bowls) is water-damaged and cannot be sold. Because this material has not reached the point in the supply chain for use by the end user, it may not be classified as post-consumer. However, it may be recovered and used for post-industrial fiber.
- A paper company changes the specifications on a brand of printing papers that contained 10% post-consumer fiber. They have decided not to sell the remaining inventory on hand, which has been recorded on their balance sheet. Instead, they reclaim the fiber from inventory and may classify it as 10% post-consumer and 90% post-industrial fiber.

Annex III: Claim Types and Control Systems

The table below is intended to more clearly illustrate the claim types supported by the RMS Paper Module, based on the claim type carried by certified input materials and the control system used by the participant.

Certified participants may at any time choose to downgrade a claim from a designated control system, as indicated in RMS Framework Section 6.4.3, but may not upgrade a claim to a claim type reflecting a higher level of physical control. That is:

- a Content claim may be downgraded to either an Average Content or Mass Balance claim;
- an Average Content claim may be downgraded to a Mass Balance claim, but may not be upgraded to a Content claim; and
- a Mass Balance claim may not be upgraded to a Content or Average Content claim.

When inputs with different claim types are combined in a process, the output carries the lesser claim type.

The claim type is distinct from the basis of the claim calculation (Recycled Fiber or Recycled Content); any claim type may be applied to either a Recycled Fiber or Recycled Content claim. For example, a Content claim type may result from either controlled blending calculation method; based on total content including fillers and coating, or fiber content.

Control System	Input Material Claim Type	Output Material Claim Type	Claim Syntax Claim Type Indicator
Segregation Method	Content	Content	n/a
	Average Content	Average Content	AC
	Mass Balance	Mass Balance	MB
Controlled Blending Method	Content	Content	n/a
	Average Content	Average Content	AC
	Mass Balance	Mass Balance	MB
Rolling Average Method	Content	Average Content	AC
	Average Content		
	Mass Balance	Mass Balance	MB
Mass Balance Credit Method	Content	Mass Balance	MB
	Average Content		
	Mass Balance		