

English version

Circular plastic products – Recycled content traceability and conformity assessment of recyclates and final products – Basic elements of a certification scheme

The draft of the National Technical Specification is published for Public Enquiry and made available towards all interested parties. The draft has been prepared by CYS National Standardisation Technical Committee CYS/TC 26 Circular Plastic Products.

The draft has been developed in English language. It may also be published in any other official language of the country and CYS holds the responsibility for the translation.

All interested parties are invited to submit their comments, providing adequate supporting documentation and justification.

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ΚΥΠΡΙΑΚΟΣ ΟΡΓΑΝΙΣΜΟΣ ΤΥΠΟΠΟΙΗΣΗΣ
CYPRUS ORGANISATION FOR STANDARDISATION

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Forward

This Technical Specification has been prepared under the direction of the CYS/TC 26 Circular plastic products, the secretariat of which is managed by CYS.

During the drafting of this standard, special attention has been paid to the requirements of equivalent International and other national standards, as well as the specific conditions and needs of the Cyprus market and stakeholders respectively

Introduction

European Union environmental policy is geared towards facilitating fundamental shifts in the economy, society, and industry. These shifts aim towards the reduction of net emissions, ultimately guiding Europe's trajectory towards climate neutrality. Notable elements of this effort encompass significant emission reduction targets for individual Member States through ambitious action plans like the transitioning from a linear to a circular economy model. One of the key policy areas identified which needs to be tackled within the scope of European Circular Economy Action Plan is plastics. Plastics are an important material in our economy and daily lives. However, they can have serious negative effects on the environment and human health. The EU adopted a European strategy for plastics as part of the EU's circular economy action plan and builds on existing measures to reduce plastic waste.

Management of plastic waste in Cyprus is mainly limited to burial, energy recovery and export to management facilities abroad. The potential for recycling is limited, both due to the nature of the material itself and the current available practices, while the market for products containing recycled content is currently at a low maturity level.

Currently, there is no National legal framework in place to regulate circular plastic products. Moreover, official monitoring is limited at reporting total quantities of plastic waste under the very broad category of "plastics". There are no subcategories or identification based on material or origin. Furthermore, technological/ science limitations do not allow the direct verification of end-product composition and its recycled content.

The effective management of plastic waste requires the identification of waste streams and their reintegration into the value chain as secondary raw material. This includes the traceability of secondary materials to ensure their redirection to the production and ultimately the market in a reliable and verifiable manner.

The purpose of this Standard is primarily to support the Cypriot industry and market via a certification scheme which will allow interested parties to verify and validate the circularity claims of plastic products. This Certification Scheme sets the framework within which a plastic product may be classified as 'circular', by providing transparent information, stating the recycled content and the origin of the recyclates. The requirements for the recyclates are based on existing standards, where applicable.

Furthermore, consumers and public procurement processes are increasingly more sensitive to sustainability criteria when selecting products and services. Certification can establish a common framework and comparable indicators, providing a decision-making tool for consumers and contracting authorities in tendering works.

Respecting the definitions of International standards on recycled content, and also promoting process optimization and circularity by design, as part of the circular economy concept, thus minimizing the waste output of plastics industries, the certification scheme, includes post-consumer or pre-consumer waste streams,

reported as recycled material. At the same time, own produced scrap material re-entering the production process is also accounted but reported separately with an upper limit, based on the current industry benchmark. Local and imported recycled material is recorded and reported separately to incentivize the use of local waste streams, thus alleviating the pressure from the national waste management system.

The Standard sets the requirements for conformity and surveillance, organized within a certification framework. The end-product receives labelling and pertinent details are communicated and marketed through certificates and marking.

1. Scope

This document specifies the basic elements of a certification scheme for both plastic recyclates and plastic end-products in order to verify conformity with requirements specified in this document, in regards to their origin and recycled content, as well as conformity with standards related to plastic waste recyclates and environmental claims.

It includes requirements regarding the production process and management system.

A product certification scheme for continuous production consists of the following stages:

- initial evaluation
- review of evidence of conformity
- certification decision and attestation
- surveillance activities.

It is intended to be used by certification bodies seeking to create and maintain certification schemes for plastic products covering one or more aspects of circular economy.

This document is applicable for all recyclable plastic materials (based on the current state of the art). The document also applies to all plastic products which can incorporate recyclate content.

NOTE 1: Plastic products must comply, when existing, with applicable legislation and/or other related requirements that ensure fitness for purpose, e.g. use of recycled content, performance product standards etc.

2. Normative references

CYS EN ISO 9001:2015 *Quality management systems - Requirements (ISO 9001:2015)*

ISO 14020:2022 *Environmental statements and programmes for products — Principles and general requirements*

CYS EN ISO 14021:2016 (+A1:2021) *Environmental labels and declarations - Self-declared environmental claims (Type II environmental labelling)*

CYS EN ISO 14050:2020 *Environmental management — Vocabulary*

CYS EN 14541-1:2022 *Plastics pipes and fittings - Utilisation of thermoplastics recyclates - Part 1: Vocabulary*

CYS EN 14899:2005 *Characterization of waste - Sampling of waste materials -Framework for the preparation and application of a SamplingPlan*

ISO 15270:2008 *Plastics — Guidelines for the recovery and recycling of plastics waste*

CYS EN 15342:2007 *Plastics - Recycled Plastics - Characterization of polystyrene(PS) recyclates*

CYS EN 15343:2007 *Plastics - Recycled Plastics - Plastics recycling traceability and assessment of conformity and recycled content*

CYS EN 15344:2021 *Plastics - Recycled plastics - Characterization of Polyethylene (PE) recyclates*

CYS EN 15345:2007 *Plastics - Recycled Plastics - Characterisation of Polypropylene(PP) recyclates*

CYS EN 15346:2014 *Plastics – Recycled plastics - Characterization of poly(vinyl chloride) (PVC) recyclates*

CYS EN 15347:2007 *Plastics - Recycled Plastics - Characterisation of plastics wastes*

CYS EN 15348:2024 *Plastics - Recycled plastics - Characterization of poly(ethylene terephthalate) (PET) recyclates*

CYS CEN/TR 15353:2007 *Plastics - Recycled plastics - Guidelines for the development of standards for recycled plastics*

ISO/IEC TR 17026:2015 *Conformity assessment — Example of a certification scheme for tangible products*

CYS EN ISO/IEC 17067:2013 *Conformity assessment - Fundamentals of product certification and guidelines for product certification schemes*

ISO 22095:2020 *Chain of custody — General terminology and models*

ISO 59004:2024 *Circular economy — Vocabulary, principles and guidance for implementation*

3. Terms, definitions and abbreviations

3.1 agglomerate

shredded and/or granulated plastics material in the form of particles which cling together

[SOURCE: ISO 15270:2008, 3.1]

3.2 batch

quantity of material regarded as a single unit, and having a unique reference

[SOURCE: ISO 15270:2008, 3.3]

3.3 circular economy

economic system that uses a systemic approach to maintain a circular flow of resources, by recovering, retaining or adding to their value, while contributing to sustainable development.

NOTE 1 to entry: *Resources* can be considered concerning both stocks and flows.

NOTE 2 to entry: From a sustainable development perspective, the inflow of *virgin resources* is kept as low as possible, and the circular flow of resources is kept as closed as possible to minimize emissions and losses (*waste*) (of *resources*) from the economic system.

[SOURCE: ISO 59004:2024, 3.1.1]

3.4 collection

logistical process of moving plastics waste from its source to a place where it can be recovered

[SOURCE: ISO 15270:2008, 3.6]

3.5 commingled plastics

mixture of materials or products consisting of different types of plastic

NOTE The term “mixed plastics” is used synonymously.

[SOURCE: ISO 15270:2008, 3.7]

3.6 contaminant

unwanted substance or material

NOTE The term “impurity” is a deprecated synonym of contaminant and should not be used.

[SOURCE: ISO 15270:2008, 3.8]

3.7 final product

product (any goods) that requires no additional transformation prior to its use

[SOURCE: ISO 14050:2020, 3.5.15]

3.8 flake

plate-like regrind

NOTE The shape of regrind depends both on the plastics being processed and the manner of processing.

[SOURCE: ISO 15270:2008, 3.15]

3.9 fluff

filament-like regrind

NOTE Common usage of the term “fluff” also includes shredder residue fractions produced in the commercial recycling of durable goods such as automobiles.

[SOURCE: ISO 15270:2008, 3.16]

3.10 homogenizing

processing to improve the degree to which a constituent and/or property is uniformly distributed throughout a quantity of plastics material

[SOURCE: EN 14899:2005]

3.11 mass balance

method to trace output, products with recycled content, with input, quantity of recycled feedstock, within a predefined boundary and within a given production batch or booking period

[SOURCE: EN 17615:2022, 3.147]

3.12 material recovery

material-processing operations including mechanical recycling, feedstock (chemical) recycling and organic recycling, but excluding energy recovery

[SOURCE: ISO 15270:2008, 3.20]

3.13 mechanical recycling

processing of plastics waste into secondary raw material or products without significantly changing the chemical structure of the material

NOTE Plastics secondary raw material is a synonym of recycle.

[SOURCE: ISO 15270:2008, 3.21]

3.14 post-consumer material

plastics material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product which can no longer be used for its intended purpose

NOTE 1 to entry: This includes returns of material from the distribution chain.

NOTE 2 to entry: Different categories of post-consumer material may be considered in the applicable product

[SOURCE: CYS EN 14541-1:2022, 3.4]

3.15 pre-consumer material

plastics material diverted from the waste stream during a manufacturing process, excluding reworked (plastics) material

NOTE 1 to entry: Previously referred to as “post-industrial material”.

NOTE 2 to entry: Different categories of pre-consumer material may be considered in the applicable product standard.

[SOURCE: CYS EN 14541-1:2022, 3.3]

3.16 recovered material

plastics material that has been separated, diverted or removed from the solid-waste stream in order to be recycled or used to substitute virgin raw materials

NOTE See ISO 14021.

[SOURCE: ISO 15270:2008, 3.27]

3.17 recovery

processing of plastics waste material for the original purpose or for other purposes, including energy recovery

[SOURCE: ISO 15270:2008, 3.28]

3.18 recyclate

plastics material resulting from the recycling of pre-consumer and post-consumer plastics products

NOTE 1 to entry: Also referred to as “secondary raw material” or “recycled plastics” or “regenerate”.

NOTE 2 to entry: Recycling can be chemical, physical or mechanical.

[SOURCE: CYS EN 14541-1:2022, 3.5]

3.19 recyclate production process

The commercial production of plastics recyclate which comprises by various unit operations, including the separation of materials, efficient removal of contaminants by washing or other methods, drying where appropriate, handling, constitution of lots, storage, packaging and shipment. In addition, other processes, such as grinding, additional sorting, homogenizing, extruding, pelletizing, micronizing or dissolution in solvent, may be necessary in order to regenerate the plastics material.

[SOURCE: ISO 15270:2008, 5.2.2.3]

3.20 recycled content

proportion, by mass, of recyclate in a product

[SOURCE: CYS EN 14541-1:2022, 3.6]

3.21 recycling

processing of plastics products into recyclate, for the original purpose or for other purposes, excluding energy recovery

[SOURCE: CYS EN 14541-1:2022, 3.7]

3.22 regrind

shredded and/or granulated recovered plastics material in the form of free-flowing material

NOTE The term “regrind” is frequently used to describe plastics material in the form of scrap generated in a plastics processing operation and re-used in-house. This term is also used to describe fine plastics powder used as filler in the recovery of plastics.

[SOURCE: ISO 15270:2008, 3.31]

3.23 reworked material

plastics material from rejected unused products or trimmings capable of being reclaimed within the same process that generated it

NOTE 1 to entry: Reworked material does not change the status of the feedstock.

NOTE 2 to entry: This definition does not cover the conditions for the use of reworked material, which can be found in the applicable product standard.

NOTE 3 to entry: Previously referred to as “own reprocessed material”.

[SOURCE: CYS EN 14541-1:2022, 3.2]

3.24 shredding

any mechanical process by which plastics waste is fragmented into irregular pieces of any dimension or shape

NOTE Shredding usually signifies the tearing or cutting of materials that cannot be crushed by fragmentation methods applicable to brittle materials, as typically carried out in a hammer mill.

[SOURCE: ISO 15270:2008, 3.33]

3.25 virgin material

plastics material in the form of pellets, granules, powder, floc, etc. that has not been subjected to use or processing other than that required for its initial manufacture

NOTE 1 to entry: Does not contain any reworked plastics material and/or plastics recyclate.

NOTE 2 to entry: Sometimes also referred to as “primary material” or “primary plastics feedstock”.

NOTE 3 to entry: It is understood that the addition of additives such as stabilizers and pigments is still resulting into a virgin (plastics) material.

[SOURCE: CYS EN 14541-1:2022, 3.1]

3.26 waste

any material or object which the holder discards, or intends to discard, or is required to discard

[SOURCE: ISO 15270:2008, 3.34]

4. General requirements and principles

4.1 General

This document will serve as a basis for certification scheme owners to create certification schemes for certifying plastic products for their recycled content and traceability.

The objective is to deliver a certification mark denoting the conformity of a plastic product to specified requirements regarding the recycled content. The aim of this document is to improve market confidence, international recognition, and consumer acceptance.

The certification mark will be supported and substantiated by a certificate of conformity, including all required information set out in this document.

4.2 Voluntary Nature

Compliance with the technical specification is voluntary. This document provides requirements for an organization choosing to develop and operate such a scheme.

4.3 Intended audience and interested parties

The intended audience which relies on the mark of conformity to make decisions, can be a client, purchaser or potential purchaser, investor, consumer, regulators, financial community, general public or other interested parties.

The interested parties may include, but are not limited to, local communities, governmental or non-governmental organizations, waste producers, waste collectors, waste sorting facilities, waste treatment facilities, product manufacturers, industry trade associations and, when relevant certification bodies.

The certification body to safeguard impartiality needs to take into consideration the views of all significant interested parties. The representation of interested parties should be balanced in such a way that no single interest predominates.

4.4 Quality management system requirements

The manufacturer of the recyclate and the final product shall establish a quality management system according to the principles of the current version of CYS EN ISO 9001:2015 *Quality management systems – Requirements*, to ensure that the following aspects are adequately satisfied:

- Risks and opportunities
- Quality objectives
- Infrastructure/ equipment

- Competence
- Control of documented information
- Control of externally provided processes, products and services
- Operational planning and control
- Release of products and services
- Control of non-conforming outputs

The certification scheme owner can specify further requirements for the quality management of the manufacturer.

4.5 Credibility of circularity statements

This document supports interested parties in substantiating their circularity statements regarding plastic products, providing valid and verifiable information. This secures the credibility of the circularity statements, thus enhancing the trust and confidence towards plastic products which incorporate circular and sustainable practices.

4.6 Comparability

This document provides a commonly accepted methodology for the calculation of recycled content in plastic products, which allows interested parties to easily compare products regarding this specific aspect.

The information provided for this comparison shall be transparent to allow interested parties to understand the limitations and assumptions made for the calculation of the recycled content.

4.7 Transparency

Intended audiences and interested parties shall be able to access information so that they understand the underlying principles, assumptions and boundary conditions associated with the environmental statement and associated scheme. This information needs to be sufficient and reasonably comprehensible to allow intended audiences and interested parties to:

- a) evaluate and potentially compare environmental statements in relation to their scientific validity and acceptance
- b) determine whether the environment statement is self-declared or has been assessed by a third party

4.8 Confidentiality

There can be limits to transparency and availability of specific information due to confidential business information, intellectual property rights or other legal restrictions. [SOURCE: ISO 14020:2022, 4.5.2]

5. Requirements for production process control

5.1 Waste-to-product flow chart

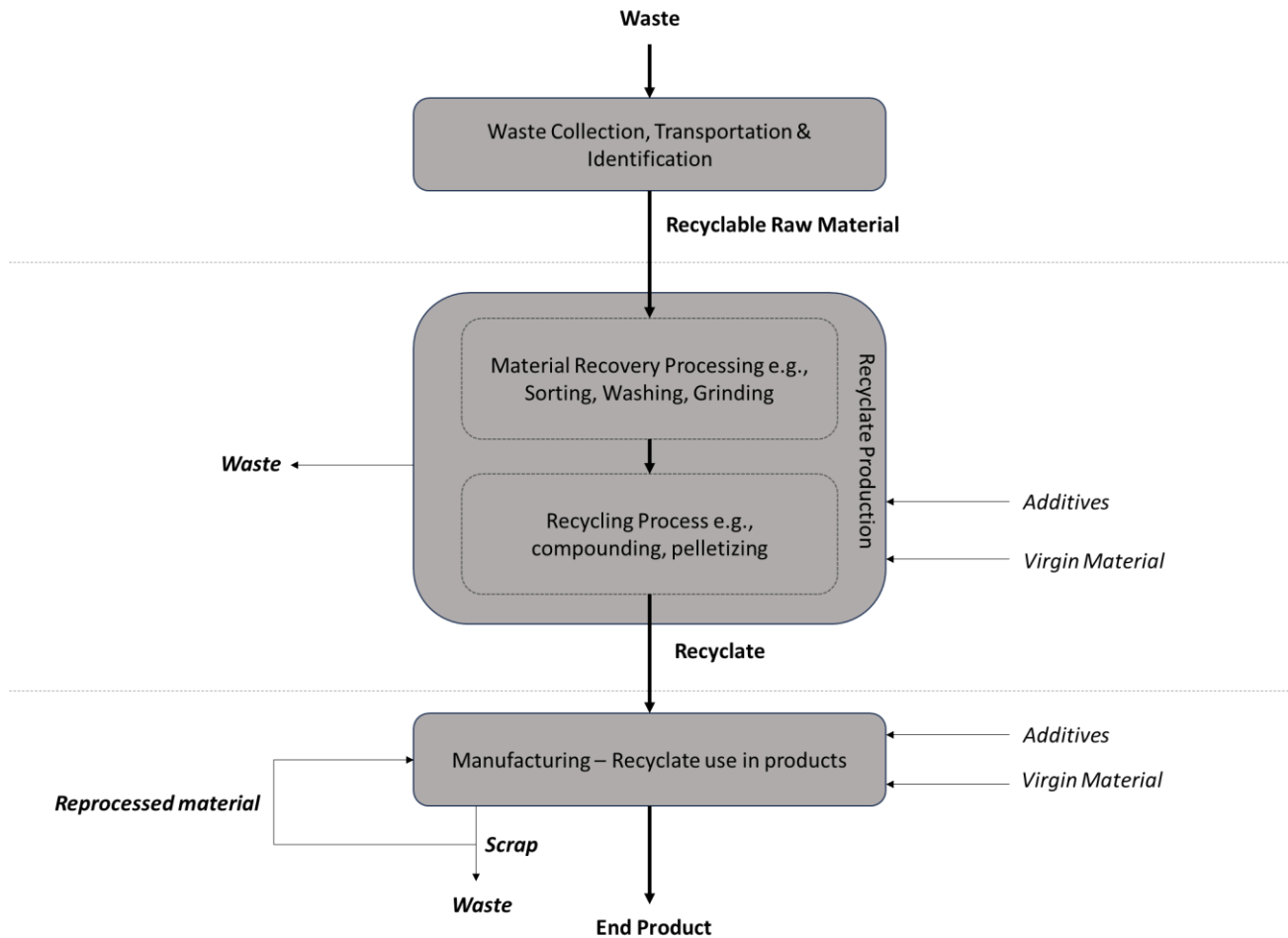


Diagram 1: Waste collection and Recycling Concept Diagram

As shown in Diagram 1, waste streams are collected and transported according to the local legislative provisions and delivered for waste treatment. Waste treatment includes material recovery process, whereas the waste is treated and prepared, by sorting, crushing, washing, and then forwarded for recycling.

At the recycling stage the material is reprocessed, e.g., grinding, agglomerating, compounding, pelletizing, and if needed additives and virgin material are included, resulting to the recyclate material. The recyclate material may consist of single or multiple sources and materials, with or without virgin material or additives, in different physical forms, e.g., regrind, flakes, powder, granules etc. The recyclate is then ready to be incorporated in the production of goods.

5.2 Requirements for production of recyclates

Waste received by a waste treatment facility must be accompanied by the necessary documentation, including all required information for waste collection according to national legislation, in order to be able to provide the information as specified in Annex I, regarding the recyclate.

Traceability and information regarding the incoming waste should take into account the requirements set out in CYS EN 15343 and CYS EN 15347. Any deviations from the standards can be the result of an agreement between the supplier and recyclate producer and adequately documented and justified.

Recyclate producer shall ensure that:

- a) requirements for the recyclates are clearly defined, including any applicable statutory and regulatory requirements.
- b) can meet the above requirements.
- c) can meet the claims for the products and services it offers.

Residual waste streams resulting from the recyclate production process, which will be directed for final disposal (energy recovery, landfill, etc.), shall be monitored, measured, documented and treated according to national legislative provisions.

Recyclate producer shall be able to provide all required information for each batch of recyclate, as specified in Annex I, and be able to provide all necessary supporting documentation. Each recyclate batch may consist by several different waste origins.

To maintain traceability of quantities, the mass of waste feedstock used for each recyclate batch shall be weighted and recorded before entry of the material in the recyclate production process. Deviations between input and output shall be able to be justified and be reasonable based on the nature of the process.

Additional information and characteristics of the recyclate may be provided upon agreement between the purchaser and supplier, according to relevant applicable standards and other specifications (CYS EN15342, CYS EN15343, CYS EN15344, CYS EN15345, CYS EN15346, CYS EN15347, CYS EN15348).

If the recyclate producer is unable to provide the required information, the material cannot be taken into account for the recycled content calculation of plastic products.

5.3 Requirements for product manufacturing

Product manufacturer shall ensure that all incoming recyclates are in conformity with the requirements mentioned in clause 6.2 and Annex I.

The manufacturer of plastic products, which incorporate recycled content, shall make available to any interested party all necessary information regarding the product, as specified in Annex II.

Manufacturer can also incorporate reworked material, which can be reported separately, subject to maximum threshold as specified in clause 7.1, based on the local industry benchmark on typical scrap rate.

In the case of imported recyclate, the material can be considered for the calculation of recycled content, if it complies with the recyclate requirements specified in clause 6.2.

In the case of assembled products, the recycled content of each component shall be calculated and considered for the total recycled content of the final commercially available assembled product (see Annex III, Example 3).

5.4 Traceability

Traceability is the ability to trace the history, application, location or source(s) of a material or product throughout the supply chain (ISO 22095:2020).

To ensure traceability, the producer and/or supplier of the recyclate and product producer shall provide data for each stage described above. All procedures for the identification and the recording of the data shall be appropriately documented and recorded.

5.5 Stock control

The storage of material must allow clear identification of the batch of material and product to allow the monitoring of traceability throughout the process.

6. Recycled content calculation

6.1 General

The verification of the recycled content is done based on the production records and product formulations. The calculation shall take into account the mass of plastic included in the product. Ingredients such as virgin plastics, additives, masterbatches, fillers etc., do account for recycled content.

Furthermore, feedstock from chemical recycling and/or alternative renewable sources such as edible oil, food waste etc., may be incorporated in the product but cannot be accounted in the recycled content under the scope of this specification.

The percentage recycled content for products shall be separately calculated for:

- Post-consumer
- Pre-consumer

- Reworked

For post-consumer and pre-consumer recyclates, the percentage of the material which derives from local sources can be separately reported.

Reworked material is separately reported and meets the thresholds specified in clause 9.

Recycled content shall be expressed quantitatively as a percentage of the total plastic mass of either the recyclate or the product, calculated as shown below. Plastic mass takes into account all ingredients included in the formulation of the recyclate and the product, e.g., additives, masterbatches, fillers etc.

Verification of the source and quantity of the recycled materials may be carried out through purchasing documentation and other available records.

The calculations should be performed for each batch of product/ recyclate.

6.2 Recycled content thresholds and requirements

During the recyclate production process, modifiers, stabilizers, fillers and virgin material may be added, to meet the fitness for purpose requirements. This might result in cross-batch variations of concentration of plastic waste into the final recyclate.

For a secondary plastic raw material to be considered as a recyclate for the purposes of this specification, it has to contain a minimum of 30% (w/w) of plastic waste.

For plastic products to be considered as circular plastic products for the purpose of this specification, the minimum threshold of recycled content in the product is set to 10%.

Regarding the product recycled content, in addition to the above, this needs to comply with the requirements for recycled material use as set out in the related fitness for purpose documentation.

For reworked material used in the product, a maximum of 10% can be reported separately, additionally to the recycled content as specified in CYS EN ISO 14021.

The recycled content thresholds serve as a minimum prerequisite for a product to qualify for certification against this scheme. They represent a minimum which can have a substantial impact on the plastic's waste management challenge, reflecting the local industry and market consensus based on the current technologies, industry practices, limitations, availability of secondary raw material and national waste management objectives and strategies.

Depending on future industry and market developments the specified values can be adjusted accordingly.

6.3 Calculation for recycled content of recyclates

Equation for calculating the total mass of a recyclate:

$$R, \text{ total recyclate mass (kg)} = W_{PCR} + W_{PIR} + W_V + W_A$$

- W_{PCR} weight of post-consumer material (kg) = $W_{PCR-L} + W_{PCR-I}$
 - W_{PCR-L} , weight of local post-consumer material (kg)
 - W_{PCR-I} , weight of imported post-consumer material (kg)
- W_{PIR} , weight of pre-consumer material (kg) = $W_{PIR-L} + W_{PIR-I}$
 - W_{PIR-L} , weight of local pre-consumer material (kg)
 - W_{PIR-I} , weight of imported pre-consumer material (kg)
- W_T , total weight of total recycled content (kg) = $W_{PCR} + W_{PIR}$
- W_V , weight of virgin material (kg)
- W_A , weight of all additives (kg)

The recycled content is calculated as follows:

- X_{PCR} , post consumer recycled content (%) = W_{PCR}/R
- X_{PIR} , pre consumer recycled content (%) = W_{PIR}/R
- X_T , total recycled content (%) = W_T/R
- X_L , total local recycled content (%) = $(W_{PCR-L} + W_{PIR-L})/R$

6.4 Calculation for recycled content of products

Equation for calculating the total mass of a product that incorporates recycled content:

$$P, \text{ total product mass (kg)} = W_{PCR} + W_{PIR} + W_{RW} + W_V + W_A$$

- W_{PCR} weight of post-consumer material (kg) = $W_{PCR-L} + W_{PCR-I}$
 - W_{PCR-L} , weight of local post-consumer material (kg)
 - W_{PCR-I} , weight of imported post-consumer material (kg)
- W_{PIR} , weight of pre-consumer material (kg) = $W_{PIR-L} + W_{PIR-I}$
 - W_{PIR-L} , weight of local pre-consumer material (kg)
 - W_{PIR-I} , weight of imported pre-consumer material (kg)
- W_{RW} , weight of reworked material (kg), not applicable for recyclate production
- W_T , total weight of total recycled content (kg) = $W_{PCR} + W_{PIR}$
- $W_T + W_{RW}$, total weight of total recycled content and reworked (kg) = $W_T + W_{RW}$
- W_V , weight of virgin material (kg)
- W_A , weight of all additives (kg)

The recycled content is calculated as follows:

- X_{PCR} , post consumer recycled content (%) = W_{PCR}/P
- X_{PIR} , pre consumer recycled content (%) = W_{PIR}/P
- X_T , total recycled content (%) = W_T/P
- X_{T+RW} , total recycled content and rework (%) = W_{T+RW}/P
- X_L , total local recycled content (%) = $(W_{PCR-L} + W_{PIR-L})/P$

NOTE: During product manufacturing, the recycled content percentage of the recyclate should be taken into account.

7. Circular economy considerations

Circular economy is a broad concept covering from cradle-to-cradle, with the purpose of maintaining a circular flow of resources, by recovering, retaining or adding to their value. This document applies to the recovering of an environmentally stressful material, such as plastics, which are petrochemical products deriving from non-renewable fossil fuel.

This document allows the consistent and systematic way to reintroduce plastic waste streams back into production process, diverting waste from landfilling thus reducing environmental and administrative load of waste management. Reintroducing plastic waste back to production also relieves the load on natural resources, especially on non-renewable resources such as fossil fuels.

Considering the 9 Rs of circular economy; Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Remanufacture, Repurpose, Recycle, and Recover; this document applies to the Rethink, Reduce, Recycle and Recover principles. The wholesome approach of this document can be extended in the designing process (Rethink, Reduce) of the products, making them more circular, by redesigning plastic products to incorporate Recovered and Recycled material.

By providing a validation methodology for the utilization and traceability of recycled material into plastic products, this document promotes and supports the following:

- sorting of waste at source
- better quality of waste streams and recyclates.
- added value of recyclate
- design for circular plastic products (for incorporating recycled content and increased recyclability)

8. Mark of conformity

8.1 Recommended marks of conformity




The mark of conformity is used on a plastic product to convey to the user that the product fulfils the minimum requirements for recycled content set out in this document. The principal purpose of the mark of conformity is to gain the confidence of the market, including consumers. The mark can have different forms in various media, such as imprinted mark, quick response (QR) codes, distributed ledger technology (e.g. blockchain) or other electronic means. The mark can be found on products, certificates and publications denoting the conformity to the requirements of a product with this document.

The marking should be in clear figures and/or in code providing traceability to production period and the production site if the manufacturer is producing at different sites nationally or internationally.

Marking should be applied on both recycle and final product.

This information may be placed on the product, on a label attached to the product, on the individual bag or on the packaging, depending on the nature of the product and how it is placed on the market.

Local Recycled Content can be marked as a percentage or using the below categories:

Local Recycled Content	Mark
10-25%	
25-50%	
>50%	

The mark should be accompanied by the following minimum marking information:

- Unique certification license number
- Product Identification
- Manufacturer name
- Batch No
- Company Logo (optional)

- Post-Consumer Recycled content (%)
- Pre-Consumer Recycled Content (%)
- Total Recycled Content (%) (optional)
- Local Recycled Content (Category) (optional)
- Reworked Recycled Content (%) (optional)
- Total Recycled Content with Reworked (%) (optional)

An example of the proposed marking is provided in Annex IV.

The above marking does not restrict the marking according to product specific standards or certifications.

9. Initial evaluation

Initial evaluation corresponds to the first audit/ inspection in response to a request for certification in order to determine whether a manufacturer of plastic recyclates and/or plastic end-products implements a management system that complies with the requirements specified in this certification scheme and/or other requirements set by the certification body.

10. Surveillance requirements

Products (end-products and/or recyclates) for which has been granted certification shall be subjected to surveillance actions, to evaluate whether the initial conditions that led to their certification remain the same.

These surveillance actions include the performance of audits/inspections, collecting of samples from the manufacturing site and/or from the market. The frequency of surveillance is annual unless other circumstances occur. In such cases the frequency of surveillance shall be decided by the certification body.

The manufacturer and certificate holder are responsible for guaranteeing complete access to all sites, directly or indirectly related to the relevant processes of production. The access is provided to assure compliance to the essential requirements of the final product with the applicable standards.

The decision to maintain (or not) certification is taken by the Certification Committee, based on the review of the audit/ inspection surveillance results.

11. Suspending or withdrawing a certification and license

If there are valid reasons suggesting that the certificate holder is in violation of the certification rules and/or other compliance requirements for products covered by one or more certificates, the certification body can proceed to the suspension of certification, or the withdrawal of these certificates.

In these cases, the certificate holder shall immediately stop the use and the apposition of the Mark on the relevant products and stop to use all the material advertising where reference to the certification status is made.

12. Managing changes affecting certification

The certification body will give due notice to certificate holders, of any changes it intends to make in its requirements for certification and will provide reasonable period for certificate holders to proceed to any necessary adjustments.

The manufacturer of recycle or the final product is obligated to notify the certification body if any changes are made to the certified products concerning the recycled content and formulation of products.

ANNEXES

Annex I: Recyclate information requirements

A. Administrative Information

- Date of Issue
- Manufacturer contact details
- Supplier contact details (if different from above)
- Batch No
- Production Date
- Batch Weight
- Plastic material type/description

B. Composition Information

For Local and External origin Post Consumer Recycled (PCR) plastics and Post Industrial Recycled (PIR) plastics:

- Weight, kg
- Weight, %
- material origin documentation (i.e. EWC code(s), Waybill(s) No, Invoice(s), Certificates)
- Total PCR recycled content of recyclate (%)
- Total PIR recycled content of recyclate (%)
- Virgin Material (kg)
- Additives (kg)

C. Technical Information

- Physical form – granule /flake /regrind
- Density (Kg/m³)
- Melt Flow Index (MFI)
- Contamination /impurities - Filtration level
- Humidity content (less than <1%)
- Additional Test according to 5.2

For each parameter state the result and the test method.

Annex II: Product information requirements

A. Administrative Information

- Date of Issue
- Manufacturer contact details
- Supplier contact details (if different from above)
- Batch No
- Production Date
- Batch Weight
- Plastic material type/description

B. Composition Information

For Local and External origin Post Consumer Recycled (PCR) plastics and Post Industrial Recycled (PIR) plastics

- Weight, kg
- Weight, %
- Material origin
- Recyclate Batch no(s)
- Total PCR recycled content of product (%)
- Total PIR recycled content of product (%)
- Total local recycled content of product (%)
- Total own repossessed content in product (%)
- Virgin Material* (kg)
- Additives* (kg)

*Including those in recyclate

Annex III: Calculation Examples

Example 1: Production of Recyclate

Inputs:

$$W_{\text{PCR}} = 100.0 \text{ kg}$$

$$W_{\text{PCR-L}} = 60.0 \text{ kg}$$

$$W_{\text{PCR-I}} = 40.0 \text{ kg}$$

$$W_{\text{PIR}} = 20.0 \text{ kg}$$

$$W_{\text{PIR-L}} = 20.0 \text{ kg}$$

$$W_{\text{PIR-I}} = 0.0 \text{ kg}$$

$$W_{\text{RW}} = 0.0 \text{ kg (not applicable for recyclates)}$$

$$W_{\text{V}} = 130.0 \text{ kg}$$

$$W_{\text{A}} = 10.0 \text{ kg}$$

Outputs:

$$R = W_{\text{PCR}} + W_{\text{PIR}} + W_{\text{RW}} + W_{\text{V}} + W_{\text{A}} = 260.0 \text{ kg}$$

$$W_{\text{T}} = W_{\text{PCR}} + W_{\text{PIR}} = 120.0 \text{ kg}$$

$$W_{\text{T+RW}} = W_{\text{T}} + W_{\text{RW}} = 130.0 \text{ kg}$$

$$X_{\text{PCR}} = W_{\text{PCR}}/R = 100/260 = 38.5\% \text{ - post consumer recycled content percentage}$$

$$X_{\text{PIR}} = W_{\text{PIR}}/R = 20/260 = 7.7\% \text{ - pre consumer recycled content percentage}$$

$$X_{\text{T}} = W_{\text{T}}/R = 120/260 = 46.2\% \text{ - total recycled content percentage (ISO 14021)}$$

$$X_{\text{T+RW}} = W_{\text{T+RW}}/R = 120/260 = 46.2\% \text{ - total recycled content percentage (including rework if applicable)}$$

$$X_{\text{L}} = (W_{\text{PCR-L}} + W_{\text{PIR-L}})/R = 80/260 = 30.8\% \text{ - total local recycled content percentage}$$

Proposed marking in Annex IV.

Example 2: Production of Product**Inputs:**

Verify the recycled content of a product, produced using the above recyclate, with a final product recycled content of 20% (without rework).

Recyclate	Product
$X_T = 46.1\%$	$X_T = 20.0\%$
	$P = 500.0 \text{ kg}$

Outputs:

$$W_T = 500.0 * 0.2 = 100.0 \text{ kg}$$

Thus, $R = 100.0 / 0.461 = 216.9 \text{ kg}$ of recyclate

$$W_A + W_v = 500.0 - 216.9 = 283.1 \text{ kg of virgin material and additives}$$

Using the above composition, the recycled content a claimant can state:

$$\text{Total recycled content} = 20.0\%$$

$$\text{PCR content} = R * X_{\text{PCR}} / P = (216.9 * 0.385) / 500 = 16.7\%$$

$$\text{PIR content} = R * X_{\text{PIR}} / P = (216.9 * 0.076) / 500 = 3.3\%$$

$$\text{Local recycled content} = R * X_L / P = (216.9 * 0.308) / 500 = 13.4\%$$

If, the producer substitutes virgin material with rework material, which allows a maximum of 10% w/w originating from reworked material to be reported as additional recycled content, then the claimant can substitute up to 50kg of virgin material and can additionally state:

$$X_{T+RW} = W_{T+RW} / P = 150 / 500 = 30.0\%$$

Proposed marking in Annex IV.

Example 3: Assembled product**Inputs:**

The component from example 2 is then used and assembled with another component for a commercially available final product. Calculate the recycled content of the assembled final product.

<i>Component A</i>	<i>Component B</i>
<i>Mass: 0.2kg</i>	<i>Mass: 0.1kg</i>
<i>Recycled Content (X_T): 20.0%</i>	<i>Recycled Content (X_T): 20.0%</i>
<i>Recycled Content with rework (X_{T+RW}): 30.0%</i>	<i>Recycled Content with rework (X_{T+RW}): 0%</i>
<i>Local Recycled Content (X_L): 13.30%</i>	<i>Local Recycled Content (X_L): 0%</i>

Final product

Total Mass: 0.3kg

Recycled content: $(0.2 * 20.0\% + 0.1 * 20.0\%) / 0.3 = 20.0\%$

Recycled content with rework: $(0.2 * 30.0\% + 0) / 0.3 = 20.0\%$

Local Recycled Content: $(0.2 * 13.3\% + 0) / 0.3 = 8.9\%$

Annex IV: Marking Examples

Label using the examples of Annex III.

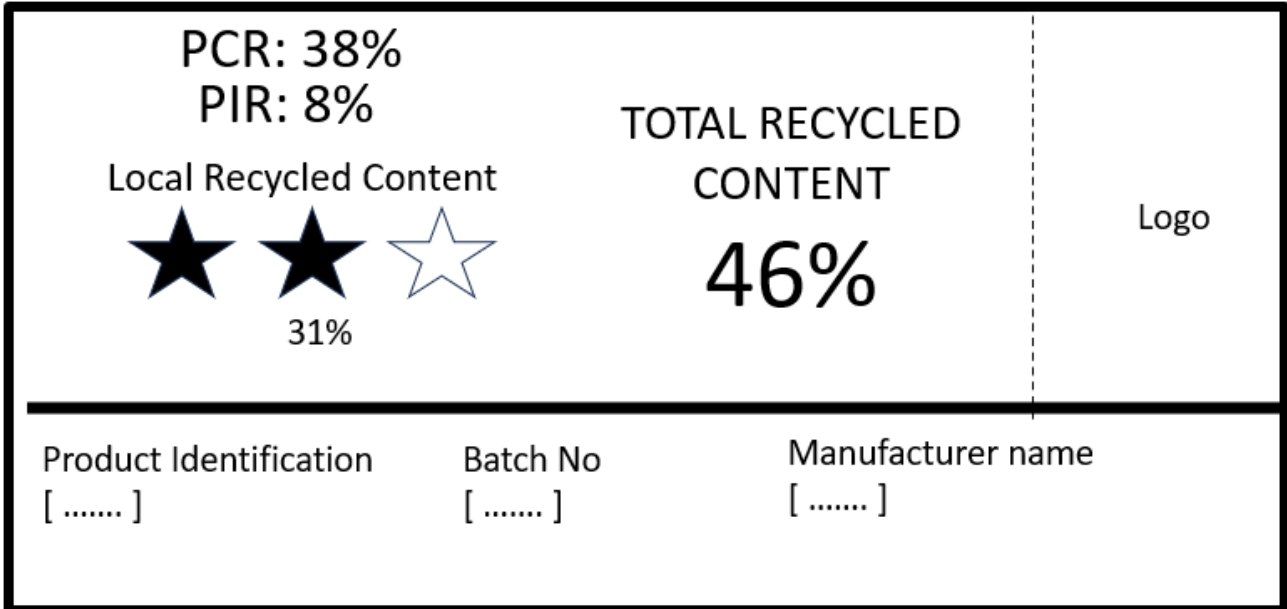


Figure 1: Proposed marking for recycle

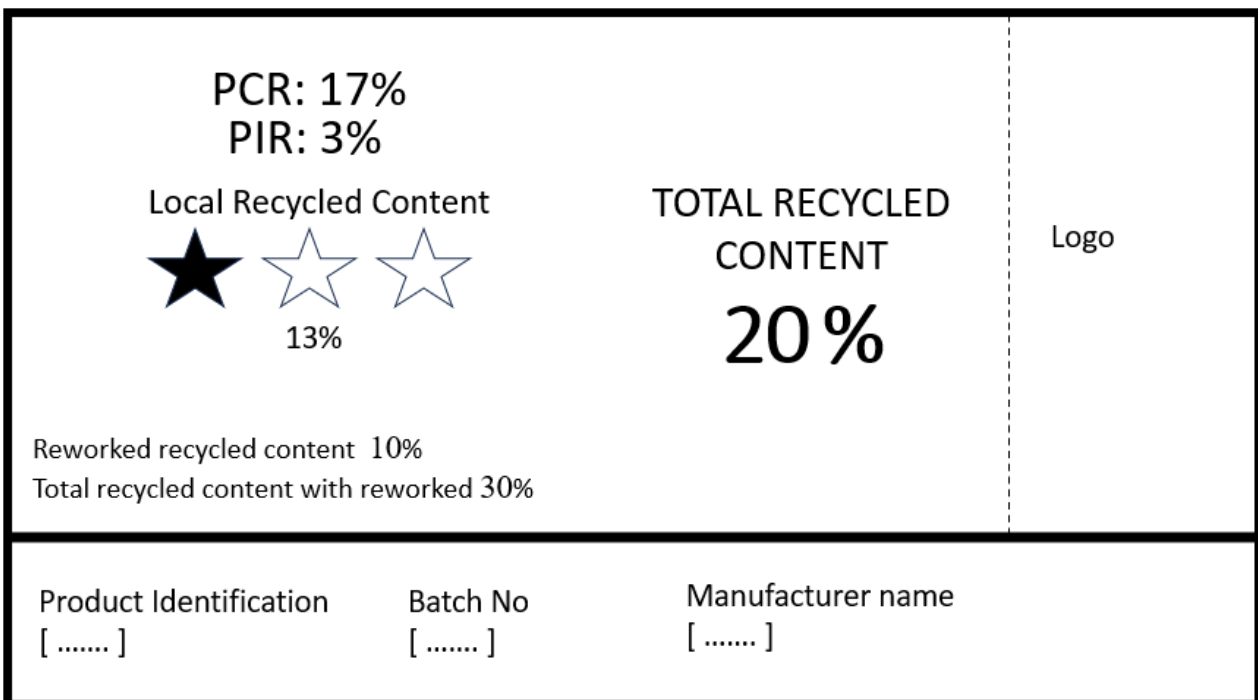


Figure 2: Proposed marking for product

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