
Embalaža - Načrtovanje za recikliranje plastične embalaže - Postopek za ocenjevanje zmožnosti recikliranja toge embalaže iz biorazgradljive plastike

Packaging - Design for recycling for plastic packaging products - Recyclability evaluation process for rigid packaging made of biodegradable plastics

Verpackung - Recyclingorientierte Gestaltung von Kunststoffverpackungsprodukten - Verfahren zur Bewertung der Recyclingfähigkeit von starren Verpackungen aus biologisch abbaubaren Kunststoffen

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ICS:

13.030.50	Recikliranje	Recycling
55.020	Pakiranje in distribucija blaga na splošno	Packaging and distribution of goods in general
83.080.20	Plastomeri	Thermoplastic materials

kSIST-TS FprCEN/TS 18395:2026**en,fr,de**

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TECHNICAL SPECIFICATION
SPÉCIFICATION TECHNIQUE
TECHNISCHE SPEZIFIKATION

FINAL DRAFT
FprCEN/TS 18395

July 2026

ICS 13.030.50; 55.020; 83.080.20

English Version

**Packaging - Design for recycling for plastic packaging
products - Recyclability evaluation process for rigid
packaging made of biodegradable plastics**

Verpackung - Recyclingorientierte Gestaltung von
Kunststoffverpackungsprodukten - Verfahren zur
Bewertung der Recyclingfähigkeit von starren
Verpackungen aus biologisch abbaubaren Kunststoffen

This draft Technical Specification is submitted to CEN members for Vote. It has been drawn up by the Technical Committee CEN/TC 261.

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Ref. No. FprCEN/TS 18395:2026 E

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European foreword

This document (FprCEN/TS 18395:2026) has been prepared by Technical Committee CEN/TC 261 “Packaging”, the secretariat of which is held by AFNOR.

This document is currently submitted to the Vote on TS.

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Introduction

Biodegradable plastics are polymeric materials with the special intrinsic property that is determined by the composition and structure of a material allowing them to biodegrade under specific environmental conditions. Biodegradability of polymeric materials is determined by the chemical structure responsible for functional group stability, reactivity, hydrophilicity and swelling behaviour. The rate and extent of biodegradation depend on the polymer's chemical composition, crystallinity, molecular weight, and environmental parameters such as temperature, moisture, pH, and microbial community composition.

From this perspective, biodegradable plastics are very different from other plastics in that they have several end-of-life options and should not be treated together with the general group. While compostability was in the focus for many years, biodegradable plastics are also recyclable as was proven in numerous studies.

This is especially true for the biodegradable polyesters like PLA, PBAT, PHA, PBS and the like, which behave similar to PET. However, separate sorting and recycling at scale is still to be built up and recycling technologies are not mature yet. Therefore, this document is based on the best available knowledge and expertise at the time of drafting, including experience from companies currently engaged in biodegradable plastics recycling and from ongoing European projects related to the scale up of sorting and recycling procedures for these materials and from other plastics. As technical developments progress and further consensus is achieved the content of this document may be subject to modification, review and revision.

The objective of this document is to facilitate consistent design for recycling criteria for rigid packaging made from biodegradable plastics, ensuring that when technologies mature and/or are brought to a larger scale, these specifications can be smoothly incorporated into the broader standard framework.

This document intends to follow the philosophy of EN 18120. Given the early market implementation in Europe of packaging made from biodegradable plastics and the low volumes of such packaging currently in the waste streams, existing material recycling technologies for packaging waste made from biodegradable plastics (with levels of maturity varying depending on the polymer type) do not currently fit into the "state-of-the-art" definition as set in EN 18120. Therefore, these TS are proposed outside the scope of EN 18120 at this stage, while maintaining its philosophy and structure as closely as possible. EN 18120 aims via series of guidelines and protocols to establish consistency and improvement for the Design for recycling for household, industrial and commercial plastic packaging products.

Design for recycling guidelines are a common way of describing compatibility with plastic packaging collection, sorting and recycling into recycled plastic. They provide guidance on the level compatibility, defined as:

- Green: Packaging constituents with full compatibility with collection, sorting and recycling;
- Yellow: Packaging constituents with limited compatibility with collection, sorting and recycling;
- Red: Packaging constituents which are not compatible with collection, sorting and recycling.

These categories reflect compatibility under current technological conditions and do not represent state-of-the-art recycling performance as defined in EN 18120. Recyclability guidelines will require regular review and improvement to reflect innovations in design, collection, sorting and recycling.

The Design for Recycling Guidelines provided in this series of documents are representative of the European market and cover all steps from design for recycling, packaging waste collection, sorting, recycling into recycled plastic and to use in a new application. Compliance with the design guidelines does not guarantee that the recycled plastic quality will be fit for purpose for a specific targeted end application or compliant with applicable regulations.

Packaging recyclability is the combination of design for recycling, proven collection, sorting, and recycling.

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FprCEN/TS 18395:2026 (E)

1 Scope

This document defines requirements for the evaluation process for the part of the rigid packaging unit which comprises the main body and the integrated components and is predominantly made of biodegradable plastics and for separate components predominantly made of biodegradable plastics with respect to compatibility of the design with the collection, sorting, and recycling processes.

2 Normative references

The following documents are referred to in the text in such a way their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 178, *Plastics — Determination of flexural properties (ISO 178)*

EN ISO 179-1, *Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test (ISO 179-1)*

EN ISO 179-2, *Plastics — Determination of Charpy impact properties — Part 2: Instrumented impact test (ISO 179-2)*

EN ISO 527-1, *Plastics — Determination of tensile properties — Part 1: General principles (ISO 527-1)*

EN ISO 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2)*

EN ISO 527-3, *Plastics — Determination of tensile properties — Part 3: Test conditions for films and sheets (ISO 527-3)*

EN ISO 527-4, *Plastics — Determination of tensile properties — Part 4: Test conditions for isotropic and orthotropic fibre-reinforced plastic composites (ISO 527-4)*

EN ISO 527-5, *Plastics — Determination of tensile properties — Part 5: Test conditions for unidirectional fibre-reinforced plastic composites (ISO 527-5)*

EN ISO 1133-1, *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Part 1: Standard method (ISO 1133-1)*

EN ISO 1133-2, *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Part 2: Method for materials sensitive to time-temperature history and/or moisture (ISO 1133-2)*

EN ISO 11357-3, *Plastics — Differential scanning calorimetry (DSC) — Part 3: Determination of temperature and enthalpy of melting and crystallization (ISO 11357-3)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply. For all other terms that are not defined below, please refer to the definitions in the EN 18120-1.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp/>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1**aliphatic-aromatic copolyesters**

thermoplastic copolyester made by the polycondensation of an aliphatic diol with aliphatic and aromatic diacids

3.2**biodegradable plastic**

plastic capable of undergoing biological decomposition, such that it ultimately decomposes into carbon dioxide (CO₂), biomass and water, and meets the inherent biodegradability requirements of the relevant composting standards

Note 1 to entry: Biodegradable plastic in the context of this document is characterized only by its inherent biodegradability as per EN 13432:2000 (and not by other requirements of EN 13432:2000).

3.3**depolymerisation**

reversion of a polymer to its monomer(s) or to a polymer of lower relative molecular mass

3.4**green category**

category for identifying components or constituents of a plastic packaging that is in the scope of the design for recycling guidelines of a given packaging type and are recognised as compatible with collection, sorting and recycling processes or are demonstrated as suitable for recycling through technical evaluation and can fully meet the quality requirements of secondary raw material in the recycling process

3.5**oxo(bio)degradable additive, oxo(bio)degradation additive**

additive which, through oxidation, lead to the fragmentation of the plastic material into micro-fragments or to chemical decomposition

Note 1 to entry: Definition is based on definition EN 18120-1:2026, 3.92.

Note 2 to entry: Oxo(bio)degradable additive and oxo(bio)degradation additive are used synonymously.

3.6**polybutylene adipate terephthalate****PBAT**

thermoplastic copolyester made by the polycondensation of 1,4 butandiol with terephthalic acid and adipic acid

3.7**polybutylene succinate****PBS**

thermoplastic polyester made by the polycondensation of succinic acid and 1,4-butanediol

3.8**polycaprolactone****PCL**

thermoplastic polyester made by the ring-opening polymerization of ϵ -caprolactone

3.9**polyethylene glycol****PEG**

thermoplastic polyether made by polymerization of ethylene glycol