Stiftung Zentrale Stelle VERPACKUNGSREGISTER

Minimum standard for determining the recyclability of packaging subject to system participation pursuant to section 21 (3) VerpackG

in agreement with the German Environment Agency (Umweltbundesamt)

Osnabrück, 28 August 2025

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Context and introduction

This minimum standard enables companies to determine the recyclability of their packaging subject to system participation for the German market. This can be relevant in a variety of ways:

- The result of this mathematical determination (packaging recyclability percentage) is the basis for participation fees as per section 21 (1) of the 'Gesetz über das Inverkehrbringen, die Rücknahme und die hochwertige Verwertung von Verpackungen' (Act Governing the Placing on the Market, Collection and High-Quality Recovery of Packaging, known in German as the 'Verpackungsgesetz' or 'VerpackG'). The systems (PROs) set these participation fees in alignment with recyclability.
- For companies, the determination results can be the starting point for optimising their packaging and designing it better for recyclability. Doing so can help these companies meet any internal requirements or targets for packaging design for recyclability.
- In light of the ban on non-recyclable packaging that will come into effect in 2030 pursuant to Article 6 of Regulation (EU) 2025/40 of 19 December 2024 on packaging and packaging waste (PPWR), companies can use the determination results as an indicator of whether their packaging is expected to remain marketable from today's perspective and to identify any potential need for action early on, subject to any future European legislative developments.

In accordance with the PPWR, recyclability is a packaging property under this minimum standard. Recyclability quantifies how suitable a packaging unit is for a recycling process that generates secondary raw materials of sufficient quality – compared to the original material – to replace the primary raw material of the same substance in typical applications for that material. As per the requirements for design for recyclability set out in section 21 VerpackG (Packaging Act) and Article 6 PPWR, recyclability is quantified as a percentage of a packaging unit's weight. This determination of recyclability is undertaken using a uniform methodology, irrespective of the material type:

Step 1: Delineate the object of determination

As a rule, recyclability is determined for an unfilled unit of packaging as a whole, including closures, decorations, labels, etc. Exceptions to this rule regarding the object of determination are discussed in Chapter 2.

Step 2: Assign to a packaging category

The object of determination then has to be assigned to a packaging category (see Annex 1).

Step 3: Determine recyclability

Recyclability is determined separately for each object of determination. The determination principles for each packaging category are included in Annex 2.

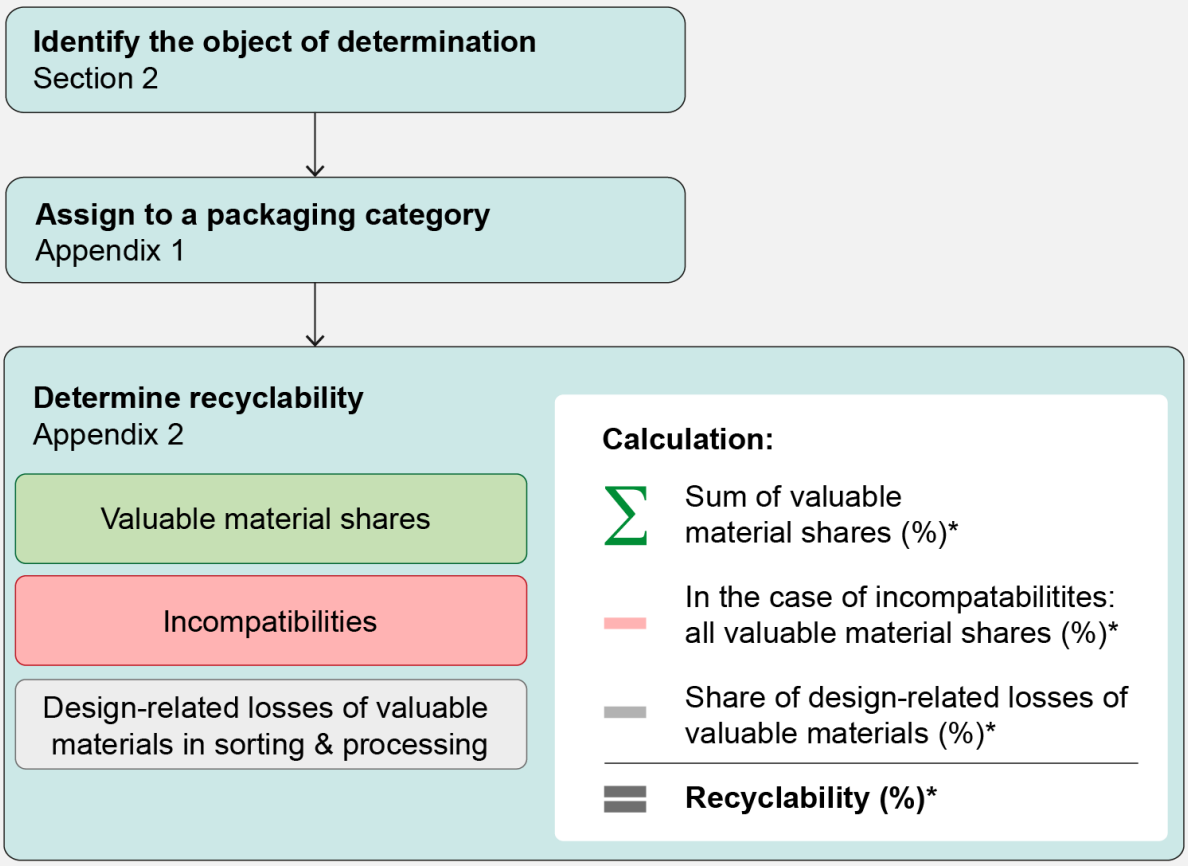
The tables in Annex 2 categorises design parameters according to their recyclability. Parameters are assigned to the categories 'valuable material', 'incompatibilities', 'separable or conditionally compatible' and 'requiring examination'. These categories were defined by the ZSVR and German Environment Agency on a scientific basis and in reference to the waste

management context (separate collecting, sorting in separate streams, recycling (processing), applying recyclate). On this basis, recyclability is determined as follows:

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material' (see Annex 2 for calculation details). This scenario represents the standard case. Potential deductions under point 2 apply.
2. If one or more design parameters are assigned to the 'requiring examination' category, the user has to determine if the design causes valuable material to be lost when determining recyclability. If such losses can be ruled out through examination, the characteristic value of a parameter has no impact on the calculation in accordance with point 1. Otherwise, design-related losses must be determined and deducted. Annex 2 also includes information about required examination and about determination rules.
3. If one or more design parameters are assigned to the 'incompatibilities' category, recyclability of the object of determination is 0%.

If design parameters are assigned to the 'separable or conditionally compatible' category or not listed at all, they are neither valuable materials nor incompatibilities. This has to be taken into account during the determination process under points 1 to 3. The recyclability of the object of determination can usually be improved if these design parameters are replaced with valuable material in the course of an optimisation.

Figure 1 illustrates the process for determining recyclability.



* as a percentage of the determination object's mass

Figure 1: structure and application of the minimum standard

For some packaging categories, no or only limited infrastructure recycling infrastructure in the aforementioned sense exists. In these cases, Annex 2 states that the existence of recycling infrastructure has to be evidenced in each individual case for recyclability to be above 0 %.

Recyclability is calculated as follows:

$$\text{Recyclability [\%]} = \frac{\text{valuable material content [g] - design-related valuable material losses [g]}}{\text{total weight of object of determination [g]}} \times 100 \; *$$

* If one or more design parameters are assigned to the 'incompatibilities' category, recyclability is 0 %.

1. Legal framework under the Verpackungsgesetz

An essential goal of extended producer responsibility regulations is to incentivise producers to consider their products' environmental impact throughout the entire product life-cycle, especially eventual disposal, from the outset of design and production.[1] That is why lawmakers have broadened extended producer responsibility provisions under the Verpackungsgesetz (Packaging Act – VerpackG) to include an obligation for systems (PROs; system operators according to section 18 VerpackG) to set monetary incentives through system participation fees.

Section 21 VerpackG requires that general recyclability be considered when calculating participation fees. However, no specific legal requirements have been introduced for increasing or reducing these fees because, on the one hand, such requirements cannot currently be quantified in a universally binding manner based on the current state of knowledge and, on the other hand, they would constitute a significant encroachment on the pricing freedom of the systems (PROs), which is protected under German antitrust law.[2] Specifically, section 21 (1) VerpackG stipulates that:

> '(1) Systems are obliged to calculate their participations fees in such a way that incentives are included with a view to the production of packaging subject to system participation
>
> 1. to promote the use of materials and material combinations that allow for the highest possible percentage to be recycled, taking into account the practice of sorting and recovery [...]'

In order to provide the systems (PROs) with a uniform framework for the determination of recyclability as defined in section 21 (1) no. 1, section 21 (3) requires the ZSVR to publish a minimum standard every year in agreement with the German Environment Agency.[3] The Verpackungsgesetz requires annual publication of the minimum standard, in agreement with the German Environment Agency and no later than 1 September.

Stakeholders were initially involved in preparing this minimum standard through an expert committee. The minimum standard draft was based largely on recommendations from the

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1 Bundestag printed paper no. 18/11274, explanatory statement for section 21, p. 107

2 ibid

3 ibid

ZSVR's Expert Committee III and subsequently refined to incorporate consultation feedback. The minimum standard was finalised after the consultation procedure was completed.

The minimum standard is to be used to determine the recyclability of packaging placed on the German market during the calendar year following the minimum standard's publication.

2. Object of determination

It is the packaging as a whole[4], after use, that is usually the object of determination.

The recyclability determination refers to the unfilled packaging as a whole, including all integrated packaging components such as labels, sealing films, caps, covers and lids, adhesive applications, safety seals and closures, etc. Separability by hand is not a criterion for determining recyclability.

The following exceptions to this rule for separate packaging components apply:

(1) Components of packaging are to be determined separately if and to the extent that they necessarily and irrevocably have to be separated for consumption or use (e.g. tear-off strips, crown corks, champagne corks, clasps).
(2) Separate packaging components also include wrappings such as folding boxes or wrapping films, and
(3) non-attached packaging components that serve to protect the product during transport or to package individual product or assembly components, and
(4) inserts, organisers, paper or plastic dividers if these are not glued in nor otherwise attached to the packaging through a force-based or form-based connection.
(5) Recyclability must also be determined for individual packaging components in cases where the packaging components can be separated from each other simply through mechanical stress during transportation or preparation for sorting; as such, they would appear separately in the first relevant sorting stage, as can be assumed, e.g. for slip and snap-on lids and overcaps with no undercuts. This exception is applicable only to packaging intended to be allocated to the mixed collection of lightweight packaging (yellow sack, yellow bin, recycling bin).

Determination results for separate packaging components relate to those packaging components only; they must not be factored into a packaging unit's weighted total (see figure 2).

The determination of packaging in clusters is permissible if the individual packaging units in such a cluster possess the same material structure and only differ in terms of contents and/or quantity, but not in terms of relevant process-specific criteria (see **criteria in Chapter 3**). An example of where categorising packaging as a cluster does not make sense is where plastic articles are identical in their material structure but only partially sortable due to differences in colouring. For cluster determinations, the minimum recyclability percentage has to be determined and then applied to all packaging units of that cluster.

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[4] 'Functional unit of packaging' within the meaning of DIN/EN 13430, or DIN/EN 13427. This functional unit of packaging usually consists of various components (the smallest parts of packaging).

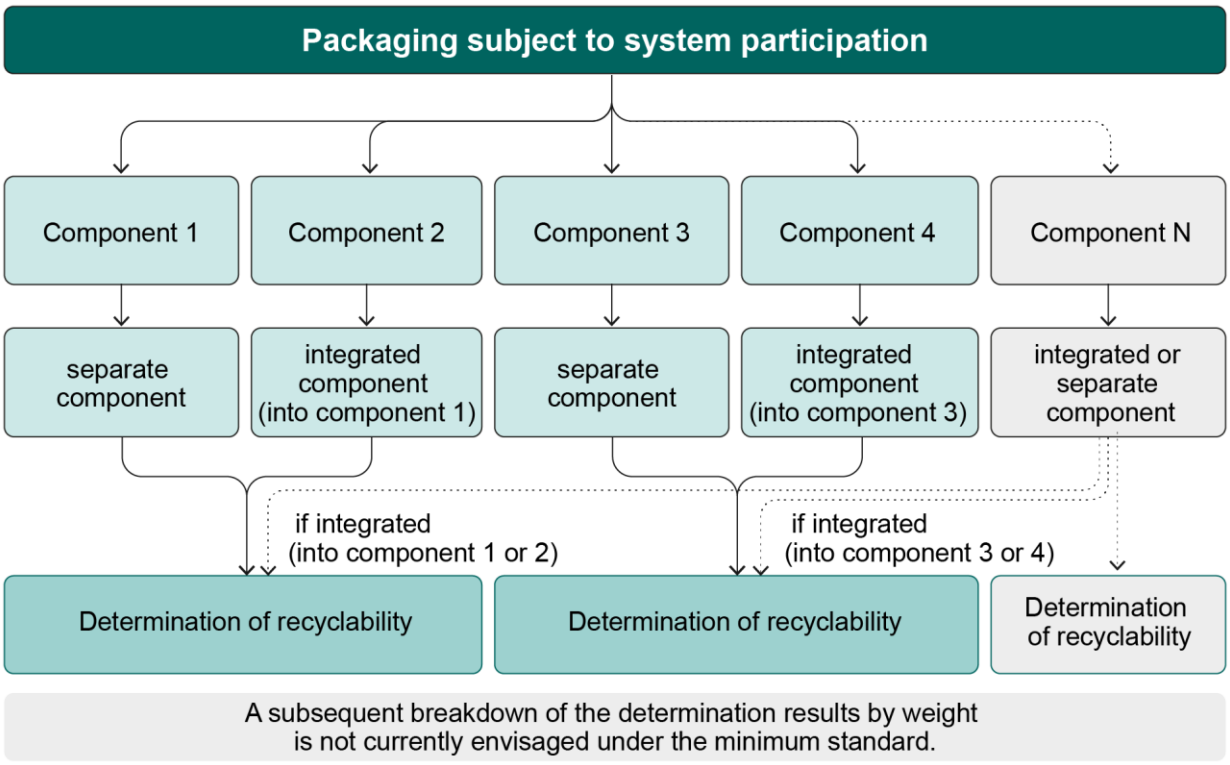

Figure 2: Diagram illustrating the identification process for an object of determination

Example application – cream jar in a folding box:

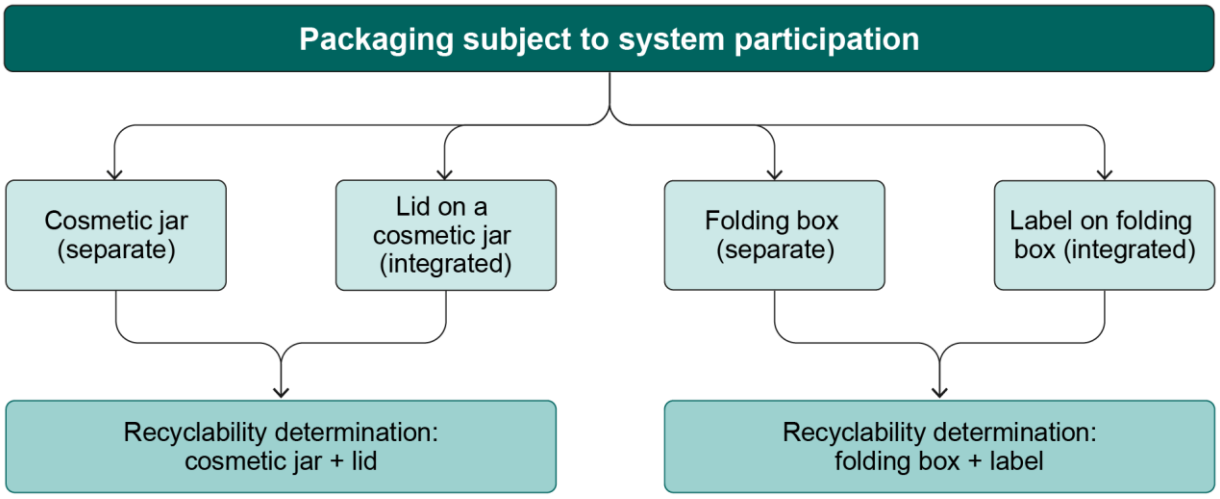

Figure 3: Diagram illustrating the identification process for an object of determination using an example

3. Description of the recyclability determination methodology and criteria

At a minimum, the determination of recyclability must take into account the available valuable material share of a packaging unit. In determining the available valuable material share, Annex 2 must be applied to verify and consider at least the following four requirements:

1. Packaging components or substances contained in the packaging materials must not be recycling-incompatible; **recycling incompatibilities** may render successful recycling unfeasible.
2. The packaging and/or separate packaging component must be **sortable** by its valuable material share.
3. The packaging materials must be **separable** after liberation if this is necessary to enable recycling that generates secondary raw materials of sufficient quality – compared to the original material – in order to replace the primary raw material of the same substance in typical applications for that material.
4. A **recycling infrastructure** must exist that allows for this packaging and/or separate packaging component to be recycled in such a way that secondary raw materials of sufficient quality – compared to the original material – are generated to replace the primary raw material of the same substance in typical applications for that material.

If the object of determination meets these requirements without qualification, the valuable material share determines recyclability. If criteria 1 or 4 have not been met, the packaging is not recyclable under this minimum standard. Criteria 2 and 3 can have a quantitative influence on the determination result. Systems (PROs) may also take further criteria into account when determining recyclability.

For this minimum standard, the individual design parameters of a packaging unit were checked for conformity with recycling requirements. This check was conducted for each packaging category in accordance with Annex II table 1 PPWR. The packaging category is determined by the main body's predominant material. The individual packaging types' category assignment can be found in Annex 1, which also refers to the applicable section of Annex 2. The design parameters were compared with the requirements for packaging design for recyclability using the criteria that are decisive for quantitative and qualitative recycling success in the relevant packaging category. The ZSVR and UBA have already undertaken this comparison for the present version of the minimum standard; the results for the individual packaging categories are presented in Appendices 2.1 to 2.22.

The determination criteria and methodologies are presented in the following chapters.

3.1. Packaging category and recycling path assignment

A packaging unit (or a packaging component whose recyclability is to be determined separately) is assigned to a packaging category according to the main body's predominant material.

The packaging category determines which recycling path will be applied in the determination, including its specific requirements and the resulting design-for-recyclability criteria.

The mandatory assignment is presented in Annex 1, which also refers to the applicable part of Annex 2.

3.2. Valuable material share determination

Valuable materials (target materials) are materials intended to be recovered as either a main product or by-product for high-quality applications through an established recycling process applicable to a given packaging category (reference process).

The determination requirements in Annex 2 contain a list of materials and substances that are to be categorised as valuables material. Categorisation as a valuable material was undertaken in consideration of the recyclates' reference applications.

For the purposes of the 2025 minimum standard, this list is exhaustive. When additional valuable materials, substances or formulations are to be used, individual evidence needs to be documented and provided in line with Annex 3.1.

To determine the valuable material share of the object of determination, the mean shares of valuable materials (as a percentage by weight of the total weight of the object of determination) must be added together.

3.3. Identifying and determining incompatibilities

The recyclability of packaging depends on the absence of any materials, substances or other design parameters that could prevent successful recycling, i.e. the packaging must not exhibit any incompatibilities.

Annex 2 provides the basis for determining incompatibilities in each packaging category. Incompatibility is determined with reference to the relevant recyclate reference application and on the premise that adequate separation during processing is not feasible. An incompatibility reduces the recyclability of the object of determination to 0%.

For the purposes of the 2025 minimum standard, the list of incompatibilities is exhaustive. The result obtained using the tables in Annex 2 may be overridden if evidence based on analytical testing methods are documented and provided. If individual packaging compatibility was evidenced through measurement, testing must be repeated if the recyclate reference application differs from the minimum standard and is not covered by existing evidence. The requirements for individual evidence are included in Annex 3.1.

If packaging has been designed in such a way that residual packaged goods remain inside the packaging even after the packaging has been emptied as intended, the influence of the residual contents has to be taken into account when determining incompatibilities[5] if the contents cannot be separated completely during the recycling process without causing a significant loss in valuable material.

3.4. Determining packaging sortability

In the minimum standard, sortability refers to the 'sorting' step of processing where a collected mix is separated into different sorting fractions according to packaging type. This applies to the paper and lightweight packaging collected mixes. Sorting processes that separate packaging according to material type after it has been liberated (e.g. shredded) are discussed in Chapter 3.5.

A distinction must be made between packaging sorting involving individual operations that serve to prepare the packaging for sorting and the actual sorting operations resulting in sorting fractions. Established sorting processes include unit operations to prepare for sorting, such as sieving, air classifying and ballistic separation. Design criteria are not based on these sub-operations because the latest technology makes it safe to assume that running the right separation processes, including repetition and recirculation, prevents any design-related packaging losses.

The sortability criteria are based on the individual sorting fractions' production stages. The processes used in this context are:

- magnetic separation to sort steel-based packaging and steel-based separate packaging components (criterion: ferromagnetism),
- eddy current separation to sort aluminium-based packaging and non-ferrous metal separate packaging components (criterion: effective electrical conductivity);
- NIR separator to sort paper and plastic-based packaging and separate packaging components (criterion: packaging reflection spectrum in the NIR wavelength range).

The minimum standard operates under the assumption that the relevant object of determination meets sortability requirements. For some design parameters, however, that assumption has to be examined, evidenced and, where necessary, corrected. Indicators that such an examination should be undertaken are listed in Annex 2.

The requirements for individual evidence are included in Annex 3.2.

The determination result has to reflect gradually reduced sortability through a corresponding deduction in the available share of valuable material.

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[5] Special care must be taken in case of the following contents in combination with plastic packaging: silicones, acrylic polymers, polyurethanes and other cross-linkable polymers, waxes and paraffins, as well as bituminous compounds.

3.5. Determining the separability of valuable material

Recyclates for high-quality applications can only be produced if valuable materials of sufficient purity can be converted into a valuable material concentrate. To do so, the material composite needs to be liberated so that it can be separated by material property. The minimum standard refers to this recycling process stage as 'processing'.

Design-related valuable material losses during processing reduce recyclability. These losses may occur, for example, in the development of material composites where the state of technology does not allow for downstream separation by material property after liberation. Losses may also occur from modifications to specific material properties – such as density – that are used to physically separate valuable from non-valuable material.

As such, the criteria for valuable material separability following the liberation of the packaging are based on the relevant individual operations of each processing procedure.

The key procedures used in this context are:

- Mechanically pulping paper packaging to sort fibrous material through separation by geometric property (criterion: defiberability);
- Density separation to sort the grinded particles of plastics packaging by plastic type (criterion: density);
- Optical separation to sort glass fragments by transmission measurement (criterion: translucency).

The determination operates under the assumption that a packaging unit meets the requirements for separating valuable material from non-valuable material. For some design parameters, however, that assumption has to be examined and, where necessary, corrected. Indicators that such an examination should be undertaken are listed in Annex 2.

Valuable material separability is not binary, but rather a property to be determined analogously. Design-related valuable material losses during processing must be quantified through appropriate analysis and measurement methods as set out in Annex 3.2.

The determination result has to reflect gradually limited separability of value material through a corresponding deduction in the available valuable material share.

3.6. Calculating recyclability

Under this minimum standard, recyclability is determined by the valuable material share available for recycling.

The following calculation rules apply:

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material' (see Annex 2 for calculation details). This scenario represents the standard case. Potential deductions under point 2 apply.
2. If one or more design parameters are assigned to the 'requiring examination' category, the user has to determine if the design causes valuable material to be lost when

determining recyclability. If such losses can be ruled out through examination, the characteristic value of a parameter has no impact on the calculation in accordance with point 1. Otherwise, design-related losses must be determined and deducted. Annex 2 also includes information about required examination and about determination rules.

3. If one or more design parameters are assigned to the 'incompatibilities' category, recyclability is 0 %.

Recyclability is calculated as follows:

$$\text{Recyclability [\%]} = \frac{\text{valuable material content [g] - design-related valuable material losses [g]}}{\text{total weight of object of determination [g]}} \times 100\ *$$

* If one or more design parameters are assigned to the 'incompatibilities' category, recyclability is 0 %.

Determination results for separate packaging components relate to those packaging components only; they must not be factored into a packaging unit's weighted total.

4. Existence of recycling infrastructure

The existence of recycling infrastructure at an operational scale is a basic precondition for establishing recyclability of more than 0% for an object of determination. Refer to Annex 2 for whether it can be assumed that recycling infrastructure exists for a given packaging category.

Exceptions may apply in individual cases if it can be proven that (i) the infrastructure exists that is required for recycling that generates secondary raw materials of sufficient quality – compared to the original material – to replace the primary raw material of the same substance in typical applications for that material and (ii) this infrastructure is used. Evidence must be documented and provided for each individual case and must comprise the following:

(1) evidence that the result of the recycling process is of high quality within the meaning of the minimum standard, and
(2) weighing notes evidence that this recycling path has received, from systems (PROs), packaging waste of the same packaging category in a volume that is equal to or greater than the participation volume in the reference year.

Annex 3.3 lists the packaging categories for which individual evidence of recycling infrastructure existence is recommended or required for recyclability determinations other than 0%. It also contains additional information about how to provide evidence.

5. Terminology and definitions

In this document, the following definitions apply:

(1) Recyclability

It means the fundamental and gradual suitability of any given unit of packaging – after undergoing recovery processes that are available on an industrial scale (separate collecting, sorting in separate streams, recycling) – to generate secondary raw materials of sufficient quality when compared to the original material that they can replace the primary raw material of the same substance in typical applications for that material[6].

(2) Metallisation

Metallising is the application of a thin metal coating, generally aluminium, in a thickness of between approx. 5 and 50 nanometres. Producer specifications for metallising generally involve adding 'met' to the coated plastic film type (e.g. PET met, PP met). Typical packaging applications include crisp packets and bonbon wrappers.

(3) Recyclates[7]

A product (substance or mixture) that is obtained from waste and suitable to serve as a substitute for virgin material in applications typical for that material.

(4) Valuable material

Valuable materials are those materials in a unit of packaging that are to be recovered as recyclates through a material-specific recycling process (e.g. steel alloys, metallic aluminium alloys, NF metal alloys, PE plastics, fibrous material, PET-A, etc.).

(5) Non-valuable material

Non-valuable material is any material that cannot be counted towards the valuable material share.

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[6] This comprises primary or secondary recyclate applications. Examples of primary applications (i.e. use in applications of the same type) include using glass fragments from recycled waste glass to produce container glass or using polypropylene regranulate to produce paint buckets or nursery plant pots for garden beds. Examples of secondary applications include using packaging steel scrap in the production of constructional steel or polypropylene regranulate in the production of cleaning buckets or filing trays.

Recycling methods are not classified as leading to 'high-quality' recycling if they enable packaging waste to be processed only up to the point required for the recyclate to be incorporated into products of non-valuable material or products that are not typically made from virgin material of the same substance. In the context of products of non-valuable material, examples of applications with low recyclate requirements include using cellulose fibres as filler material in road construction. Products that are not typically made from virgin material of the same substance include, in particular, substitutes for wood, concrete or natural stone made from plastics that have undergone dry-mechanical treatment, such as palisades.

[7] This definition of recyclates applies only to the minimum standard in relation to section 21 (1) no. 1 VerpackG.

(6) Available valuable material share

The available valuable material share is the proportion of valuable material that is available for recycling in the total weight of an object of determination, taking into account the provisions of this minimum standard. A synonym for this term is 'recyclability'.

(7) Fibrous material

When determining valuable material shares, 'fibrous material' can be defined as the sum of fibre, fillers, starch, mineral pigment-based coating colour, including binder as well as further additives typically used in the paper industry such as wet-strength agents, glue or bound water.

(8) Composite packaging / composites[8]

Composite packaging is packaging made from two or more different material types that cannot be separated by hand. When assigning composite packaging to packaging categories under this minimum standard, the terms 'composite packaging' or 'composites' refer to packaging where no single material type accounts for more than 95% of the packaging mass.

(9) Plastics

When determining the valuable material share of plastic-based packaging, the following applies: the valuable material share (PE, PP, PO, etc.) of 'plastic-based packaging' is equal to the eponymous main polymer part (plus additives, fine-disperse filling and strengthening agents, as well as pigments included in the polymer matrix composite).

(10) Targeted separability

Targeted separability is the mechanical separability of packaging into target fractions during industrial sorting, based on the degree of identification, mass and geometric properties.

(11) Fibre-based packaging

Fibre-based packaging under this minimum standard is packaging containing more than 50% fibrous material (see 5.7 above).

(12) Reference application

Reference applications are products established on the market for which a recyclate can serve as a substitute for a primary raw material. They determine the minimum requirements on design for recyclability for a unit of packaging, its recycling process and the required recyclate quality.

(13) Main body

The main body is the component that gives a packaging format its name (e.g. bottle, bag, tube, etc.).

[8] This definition will be replaced by the definition in Article 3 (24) PPWR starting 12 August 2026.

6. Abbreviations

In this document, the following relevant abbreviations are used:

AA	Acetaldehyde
Al	Aluminium
COC	Cyclic olefin copolymer
EAN	European Article Number
EPS	Expanded polystyrene
EPRC	European Paper Recycling Council
EVA	Ethylene vinyl acetate
EU	European Union
EVOH	Ethylene vinyl alcohol copolymer
Fe	Ferrous metal
GTIN	Global Trade Item Number
HDPE	High-density polyethylene
LDPE	Low-density polyethylene
LLDPE	Linear low-density polyethylene
MAH	Maleic anhydride
MDPE	Medium-density polyethylene
MHD	Minimum shelf life
mPE	Metallocene polyethylene
MPO	Mixed polyolefin
NE	Non-ferromagnetic
NC	Nitrocellulose (also known as: cellulose nitrate)
NIR	Near-infrared
OPS	Oriented polystyrene
PA	Polyamide
PBT	Polybutylene terephthalate
PC	Polycarbonate
PE	Polyethylene
PE-X	Cross-linked polyethylene
PET	Polyethylene terephthalate
PET-A	(Amorphous) PET
PET-C	Crystalline PET
PET-G	Glycol-modified polyethylene terephthalate

PFAS	Per- and polyfluoroalkyl substances
PHB	Polyhydroxybutyric acid
PLA	Polylactic acid
PMMA	Polymethyl methacrylate
PO	Polyolefin
POM	Polyoxymethylene
PolyAl	By-product from the processing of paper grades 5.03.00 as per EN 643 or fraction number 512 consisting of polyolefin-based plastics, plastic-aluminium composites and aluminium, largely fibre-free (< 5% DM) according to technical standards
PP	Polypropylene
PRO	Producer responsibility organisation
Paper/cardboard from lightweight packaging	Paper/cardboard from the lightweight packaging collection fraction
PPWR	Regulation (EU) on packaging and packaging waste
PS	Polystyrene
PVC	Polyvinyl chloride
PVDC	Polyvinylidene chloride
PVOH	Polyvinyl alcohol
rPE	Recycled polyethylene
rPET	Recycled PET
rPP	Recycled polypropylene
rPS	Recycled polystyrene
SiOX	Silicon oxide
UBA	Umweltbundesamt (German Environment Agency)
UFI code	Unique Formula Identifier Code
UV	Ultraviolet
DM	Dry mass
VerpackG	Verpackungsgesetz (Packaging Act)
XPS	Extruded polystyrene foam
ZSVR	Zentrale Stelle Verpackungsregister (Central Agency Packaging Register)

Appendices

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Annex 1: Assign to a packaging category

Assigning an object of determination to a packaging category in accordance with Annex II table 1 PPWR and the related determination requirements

Procedure:

The following steps are required to assign an object of determination to the correct packaging category, based on this Annex:

1. In column 1, the predominant packaging material of the main body is identified.
2. If there are multiple rows with identical entries in column 1, the applicable packaging type is identified in column 2; the entries are checked in the order of the table. In column 3, typical packaging formats for the packaging types are provided by way of example to determine plausibility.
3. If the packaging type is identified in column 2, column 4 will indicate which section of Annex 2 contains the relevant provisions for determining the recyclability.

Objects of determination that cannot be assigned to a packaging category:

If an object of determination cannot be assigned to any category using the procedure described above, it should generally be assumed that no recycling infrastructure exists. Such objects are usually not sorted out and therefore not recycled; as a consequence, they are to be categorised as non-recyclable (0% recyclability). To override the result, individual evidence in line with the provisions of Annex 2.22 must be documented and provided.

	Column 1	Column 2	Column 3	Column 4
Category no.	Predominant packaging material (of the main body)	Packaging type (plus colour/optical transmittance, if applicable)	Format (illustrative and non-exhaustive)	Determination requirements in Annex
1	Glass	Glass and composite packaging of which the majority is glass	Bottles, canning jars, flacons, cosmetics pots, jars, containers, ampoules, vials made of glass (soda-lime glass), aerosol cans	2.1
2	Paper/cardboard	Paper/cardboard packaging (excluding composite packaging)	Corrugated board, folding boxes, folding cartons, trays, outer packaging, flexible paper packaging (e.g. films, sheets, pouches, lidding, cones, wrappers)	2.2

	Column 1	Column 2	Column 3	Column 4
Category no.	Predominant packaging material (of the main body)	Packaging type (plus colour/optical transmittance, if applicable)	Format (illustrative and non-exhaustive)	Determination requirements in Annex
3	Paper/cardboard	Liquid packaging board	Aseptic, non-aseptic or autoclavable cardboard composite packaging, coated on both sides, for beverages, foods with a pasty consistency, animal feed, etc.	2.3a
3	Paper/cardboard	Composite packaging of which the majority is paper/cardboard (excluding liquid packaging board)	Laminated folding boxes, composite cans, paper cups (i.e. laminated with polyolefin and with or without aluminium), trays, plates and cups, metallised or plastic laminated paper/cardboard, paper/cardboard with plastic liners/windows, wrappers	2.3b
4	Metal	Steel and composite packaging of which the majority is steel	Aerosols cans, food cans, paint and colour cans, crates, trays, buckets, barrels, tubes made of steel, including tinplate, thin sheet metal and stainless steel	2.4
5	Metal	Aluminium and composite packaging of which the majority is aluminium – rigid	Rigid formats (food and beverage cans, bottles, aerosols, barrels, tubes, cans, crates, trays) made of aluminium	2.5/2.6
6	Metal	Aluminium and composite packaging of which the majority is aluminium – semi-rigid and flexible	Semi rigid and flexible formats (containers and trays, tubes, foils, flexible foil) made of aluminium	2.5/2.6
7	Plastics	Bottles made of PET-A – rigid (transparent, clear/coloured, opaque)	Bottles and flasks	2.7

	Column 1	Column 2	Column 3	Column 4
Category no.	Predominant packaging material (of the main body)	Packaging type (plus colour/optical transmittance, if applicable)	Format (illustrative and non-exhaustive)	Determination requirements in Annex
8	Plastics	Thermoforms made of PET-A and PET-C – rigid (transparent, clear/coloured, opaque)	Mono- and multilayer trays, snap-on caps, cups, blisters, other thermoforms, etc.	2.8a
8	Plastics	Other packaging made of PET-A and PET-C – rigid (transparent, clear/coloured, opaque)	Rigid formats other than bottles and flasks as well as thermoformed packaging (including pots, tubs, cans, jars, cups, mono- and multilayer trays and containers, aerosol cans)	2.8b
9	Plastics	PET – flexible (natural/coloured)	Films, pouches, foams, stand-up pouches, carrier bags, wrapping films	2.9
10	Plastics	PE – rigid (natural/coloured)	Containers, bottles ≤ 5l, cups, trays, blisters, pots, cans, buckets ≤ 5l, canisters ≤ 5l and tubes	2.10
11	Plastics	PE – flexible (natural/coloured)	Flowpacks, pouches, nets, foams, tubular bags, shrink films, stand-up pouches, carrier bags, bags, wrapping films, bubble wrap, films, including multilayer and multimaterial packaging	2.11
12	Plastics	PP – rigid (natural/coloured)	Containers, bottles ≤ 5l, cups, trays, blisters, pots, cans, buckets ≤ 5l, canisters ≤ 5l and tubes	2.12
13	Plastics	PP – flexible (natural/coloured)	Flowpacks, pouches, nets, foams, tubular bags, shrink films, stand-up pouches, carrier bags, bags, wrapping films, bubble wrap, films, including multilayer and multimaterial packaging	2.13

	Column 1	Column 2	Column 3	Column 4
Category no.	Predominant packaging material (of the main body)	Packaging type (plus colour/optical transmittance, if applicable)	Format (illustrative and non-exhaustive)	Determination requirements in Annex
14	Plastics	HDPE and PP – rigid (natural/coloured)	Boxes and pallets, corrugated plastic sheets	2.14
15	Plastics	PS – rigid (natural/coloured)	Rigid formats (including dairy packaging, bottles ≤ 5l, trays, blisters, cans, cups and other food containers, buckets ≤ 5l, canisters ≤ 5l, tubes)	2.15a
15	Plastics	XPS – rigid (natural/coloured)	Rigid formats including trays, cups and other food containers	2.15b
16	Plastics	EPS – rigid (natural/coloured)	Rigid formats (including cool boxes, fish boxes, edge protectors and other impact protection for electronic items and trays), cups and other food containers	2.16
17	Plastics	Other rigid plastics (e.g. PVC, PC) including multi-materials – rigid	Rigid formats, including intermediate bulk containers, barrels	2.17
18	Plastics	Other flexible plastics including multi-materials – flexible	Pouches, blisters, thermoformed packaging, vacuum packaging, modified atmosphere / modified humidity packaging, including flexible intermediate bulk containers, bags, stretch films	2.18
19	Plastics	Biodegradable plastics (1) – rigid (e.g. PLA, PHB) and flexible (e.g. PLA)	Rigid and flexible formats	2.19
20	Wood, cork	Wooden packaging, including cork	Pallets, crates, boxes	2.20
21	Textiles	Natural and synthetic textile fibres	Bags, cords	2.21

	Column 1	Column 2	Column 3	Column 4
Category no.	Predominant packaging material (of the main body)	Packaging type (plus colour/optical transmittance, if applicable)	Format (illustrative and non-exhaustive)	Determination requirements in Annex
22	Ceramics or porcelain stoneware	Clay, stone, ceramics, porcelain	Pots, containers, bottles, jugs	2.22

(1) Please note that this category contains plastics that are readily biodegradable (meaning a proven ability to convert > 90 % of the original material into CO_2, water and minerals by biological processes within six months) and regardless of the feedstock used for their production. Biobased polymers that are not readily biodegradable are covered under the other relevant plastic categories.

Annex 2: Determination principles and requirements for individual packaging categories

A 2.1 Glass and composite packaging of which the majority is glass

a. Scope of application

The following determination principles, criteria and requirements apply to packaging with glass as the main material. Examples include: canning jars, bottles, jars, flacons and ampoules.

b. Categorisation of design parameters, including examination and testing requirements

The most common design parameters of glass packaging are listed below in a table, assigned to the columns 'valuable material', 'incompatibilities', 'separable or conditionally compatible', and 'examination of design-related valuable material losses'. The last categorisation mentioned may also be additive and refers to the corresponding examination or determination requirement in the lower section of the table at the end of the chapter.

c. Calculation of recyclability

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material'. This scenario represents the standard case.
2. If one or more design parameters are categorised as 'requiring examination', it must be determined whether they result in design-related valuable material losses. If such losses can be ruled out through examination, the parameter has no impact on the calculation in accordance with paragraph 1. Otherwise, design-related losses must be determined and deducted.
3. If one or more design parameters are categorised under 'incompatibilities', recyclability is 0 %.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

No individual evidence for the existence of a recycling infrastructure is required to establish recyclability.

Glass and composite packaging of which the majority is glass | Reference application: Container glass						
Main body						
			Valuable material	**Incompatibilities[9]**	**Separable or conditionally compatible**	**Examination of design-related valuable material losses**
Main body	**Material**	Normal glass (soda-lime glass)	X			
		Leaded glass		X		
		Opal glass (cryolite glass)			X	
		Borosilicate glass		X		
		Glass-ceramics		X		
		Quartz glass		X		
		Other glass containing lead		X		
	Printing, lacquer and stamping	Direct printing			X	P2.2
		Foil stamping			X	P2.2
		Lacquer			X	P2.2
Ancillary components						
			Valuable material	**Incompatibilities[9]**	**Separable or conditionally compatible**	**Examination of design-related valuable material losses**
Closure/ functional head	**Material**	Borosilicate glass		X		
		Normal glass (soda-lime glass)	X			
		Leaded glass		X		
		Opal glass (cryolite glass)			X	
		Glass-ceramics		X		
		Quartz glass		X		
		Other glass containing lead		X		
		Plastic*			X	
		Ceramics		X		
		Natural material (wood, cork)			X	
		Swing tops with non-ferromagnetic metal shares only		X		
		Non-ferrous metal and stainless steel (except valve spring and ball, swing tops)	X			
		Steel alloys, ferromagnetic (except valve spring and ball)	X			
		Valve spring and ball in plastic functional closures			X	
		Ferrous metal	X			
Label/ sleeve	**Material**	Plastic			X	P2.1
		Paper*			X	
		Paper-plastic label			X	P2.1

[9] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[10]	Separable or conditionally compatible	Examination of design-related valuable material losses
Label/ sleeve	Adhesive application	Adhesive application			X	
	Decoration	Printing ink			X	
		Foil stamping			X	
		Lacquer			X	
Wrapping and other decoration	Material	Borosilicate glass		X		
		Normal glass (soda-lime glass)	X			
		Leaded glass		X		
		Opal glass (cryolite glass)			X	
		Glass-ceramics		X		
		Quartz glass		X		
		Other glass containing lead		X		
		Plastic			X	
		Ceramics		X		
		Wicker basket			X	P9
		Metal net				P9
		Metal net, non-ferromagnetic		X		
		Natural material (wood, cork)			X	
		Non-ferrous metal and stainless steel	X			P6
		Steel alloys, ferromagnetic	X			P6
		Ferrous metal	X			P6

* Note: different categorisation for crate-based deposit systems as valuable material possible.

Examination of design-related valuable material losses

P2.1	In the case of glass packaging with adhesive labels made of plastic, the glass share covered by these labels cannot be counted towards the available valuable material share if the adhesive used produces waterproof adhesive applications.
P2.2	Glass shares with a level of transmission of less than 10%[11] in a 400 nm to 780 nm wave range (e.g. due to varnishing or tinting) cannot be counted towards the available valuable material share either.
P6	In the case of glass packaging with glued-on metal plaques, the glass share covered by this plaque cannot be counted towards the available valuable material share if the adhesive used produces waterproof adhesive applications.
P9	With demijohns (i.e. bottles covered with a basket) and metal nets the glass share is to be considered completely lost. Evidence must be documented and provided for individual exceptions.

[10] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

[11] The figure is being reviewed, with results pending. Another review will be carried out when the minimum standard is next updated.

A 2.2 Paper/cardboard packaging (excluding composite packaging)

a. Scope of application

The following determination principles, criteria and requirements apply to packaging with paper/cardboard as the main material. Examples include: corrugated board, folding boxes, paper bags and pouches.

b. Categorisation of design parameters, including examination and testing requirements

The most common design parameters of paper/cardboard packaging are listed below in a table, assigned to the columns 'valuable material', 'incompatibilities', 'separable or conditionally compatible', and 'examination of design-related valuable material losses'. The last categorisation mentioned may also be additive and refers to the corresponding examination or determination requirement in the lower section of the table at the end of the chapter.

c. Calculation of recyclability

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material'. This scenario represents the standard case.
2. If one or more design parameters are categorised as 'requiring examination', it must be determined whether they result in design-related valuable material losses. If such losses can be ruled out through examination, the parameter has no impact on the calculation in accordance with paragraph 1. Otherwise, design-related losses must be determined and deducted.
3. If one or more design parameters are categorised under 'incompatibilities', recyclability is 0 %.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

No individual evidence for the existence of a recycling infrastructure is required to establish recyclability.

Paper/cardboard packaging (excluding composite packaging) | Reference application: Corrugated base paper
Main body

			Valuable material	Incompatibilities[12]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Material	Corrugated board	X			
		Kraft paper	X			
		Moulded pulp, highly compressed	X			P6.2
		Moulded pulp, slightly compressed	X			
		Glassine	X			
		Bogus paper	X			
		Wrapping tissue	X			
		Bitumen paper		X		
		Oil paper		X		
		Wax/paraffin paper		X		
		Paper/cardboard, other sorts	X			
		Cellophane			X	
		Foamed, extruded, thermoformed component made of starch			X	
		Aluminium lamination			X	P0.1
		Plastic film (extrusion lamination, film lamination)			X	
	Dyeing	Dyed black, using carbon black				P2
	Other finishing (of the paper)	Dry strength agent: PVOH	X			P6.2
		Dry strength agent: Starch (mass and surface)	X			
		Dry strength agent: Other synthetic polymers	X			P6.2
		Sizing agent, hydrophobic (mass and surface)	X			
		Wet strength agent, impregnating agent	X			P6.2
		Mineral fillers	X			
		Other finishing	X			
	Barriers and surface finish (of the paper)	Metallisation			X	
		Mineral pigment coating incl. binding agent	X			
		Polymer dispersion coating (thermoplastic)		X		P8
		Polymer mineral coating (thermoplastic)		X		P8
		Silicone coating			X	P6.2
		Paraffin, wax, oil			X	P6.2
		Other surface finish		X		P6.2, P8

[12] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[13]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Additives and coatings (of the plastic layer)	AlOx			X	
		Metallisation			X	
		SiOx			X	
	Adhesive in multilayer structure	Dispersion adhesive			X	
		Hot-melt adhesive application, criteria of EPRC scorecard fulfilled			X	
		Hot-melt adhesive application, criteria of EPRC scorecard not fulfilled		X		P8
		Starch-based adhesive	X			
	Decoration	Direct printing, with substances on the EuPIA exclusion list		X		
		Direct printing, without substances on the EuPIA exclusion list			X	
		Foil stamping			X	
		Lacquer			X	
		Fully lacquered surface - excluding clear protective lacquer up to a thickness of ≤ 5 micrometers - excluding internal bag layers if the grammage is at least 100 g/m²				P2
Ancillary components						
			Valuable material	**Incompatibilities[13]**	**Separable or conditionally compatible**	**Examination of design-related valuable material losses**
Label	Material	Paper (not equipped with wet strength agent)	X			
		Paper (equipped with wet strength agent)	X			P6.2
		Plastic			X	
	Adhesive	Dispersion adhesive			X	
		Hot-melt adhesive application, criteria of EPRC scorecard fulfilled			X	
		Hot-melt adhesive application, criteria of EPRC scorecard not fulfilled		X		P8
		Starch-based adhesive	X			
	Decoration	Direct printing, with substances on the EuPIA exclusion list		X		
		Direct printing, without substances on the EuPIA exclusion list			X	
		Lacquer			X	

[13] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[14]	Separable or conditionally compatible	Examination of design-related valuable material losses
Seam adhesion/ attachment	**Adhesive**	Dispersion adhesive			X	
		Hot-melt adhesive application, criteria of EPRC scorecard fulfilled			X	
		Hot-melt adhesive application, criteria of EPRC scorecard not fulfilled		X		P8
		Starch-based adhesive	X			
Ancillary component (not fibre-based)	**Material**	Cellophane			X	
		Plastic (non-specific)			X	
		PVOH			X	
		Non-ferrous metal, stainless steel, magnetic materials, steel			X	P0.1, P0.2
Other design parameters						
Other design parameters	**PFAS**	PFAS share in food-contact packaging ≥ limit value according to Article 5 (5) PPWR		X		
	Structure	Plastic-coated surface - excluding internal bag layers if the grammage is at least 100 g/m²				P2
	Decoration	Metal pigments applied on a large scale (taking up > 50% of the projected surface) (lacquering, print, coating or embossing)				P2
		> 50% fully printed black (including background) using carbon black				P2
	Double-sided barrier coating					P6.2
	Contents	Non-dry contents – i.e. fibre-based packaging for example for liquids, certain foodstuffs, oils and emulsions				P6.1

* Mineral pigment coatings including binding agents without a sealing function and without a function as a water vapour, oxygen or grease barrier must be counted towards the valuable material share.

Examination of design-related valuable material losses	
P0.1	Presence of an aluminium foil layer: examination required (test if necessary) whether the design causes sorting into aluminium fraction. If so, a complete loss of valuable material for packaging category 2 has to be assumed.
P0.2	Presence of ferromagnetic components ≥ 5% by weight in relation to the object of determination: examination required (test if necessary) whether the design causes sorting into ferrous metal fraction. If so, a complete loss of valuable material for packaging category 2 has to be assumed.
P2	Testing required to determine if identifiability, including targeted separability, is given in a sensor-based sorting context. Restrictions must be taken into account as proportionate losses of valuable material.

[14] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

P6.1	When determining the recyclability of fibre-based packaging, the gradual defiberability of the fibrous material is a decisive factor. In the case of paper/cardboard packaging for non-dry contents – i.e. fibre-based packaging for example for liquids, certain foodstuffs, oils and emulsions – evidence must be provided that the operating conditions (for example, dwell time and other operating parameters in the processing of the material) of the respective recovery path (paper/cardboard or lightweight packaging collection) result in the dispersion of the fibrous material, and that the fibrous material is recycled. This obligation to provide evidence does not apply to fibre-based packaging that is typically filled with contents that are dry (< 15% moisture content), free-flowing or particulate, such as flour or sugar. The non-recoverable fibrous material share must be deducted to determine the available valuable material share. If, during the pulping of fibre-based packaging, substances that cannot be classified as fibrous material pass into the aqueous phase (water-soluble, colloidally dissolved or finely dispersed), these must be quantified by a suitable testing method and deducted when calculating the fibrous material recovery rate.
P6.2	If wet-strength agents, impregnating agents, waxes, etc., are used for fibre-based packaging, and in the case of paper or cardboard (excluding liquid packaging board) coated or metallised on both sides, the determination of defiberability needs to be based on a suitable testing methodology. The non-recoverable fibrous material share must be deducted to determine the available valuable material share. If, during the pulping of fibre-based packaging, substances that cannot be classified as fibrous material pass into the aqueous phase (water-soluble, colloidally dissolved or finely dispersed), these must be quantified by a suitable testing method and deducted when calculating the fibrous material recovery rate.
P8	For any deviating determination in the sense that incompatible substances do not negatively affect recyclability in individual cases, individual evidence produced through analytical testing[15] must be provided. Requirements for the implementation and documentation of individual evidence are specified in Annex 3.1.
Scope of application of design parameters categorised as P	
P0.1	The criterion explicitly does not apply to metallised packaging.
P2	Explicitly not applicable to large-format transport packaging (e.g. cartons).

[15] The *sheet adhesion test and visual appearance test of the accept of the coarse screening* (cf. 8.5 of the *Paper and Board – Recyclability Laboratory Test Method* published by CEPI) is a method recognised in the context of this minimum standard.

A 2.3a Liquid packaging board

a. Scope of application

The following determination principles, criteria and requirements apply to packaging with cardboard as the main material. Examples include: liquid packaging boards.

b. Categorisation of design parameters, including examination and testing requirements

The most common design parameters of liquid packaging board are listed below in a table, assigned to the columns 'valuable material', 'incompatibilities', 'separable or conditionally compatible', and 'examination of design-related valuable material losses'. The last categorisation mentioned may also be additive and refers to the corresponding examination or determination requirement in the lower section of the table at the end of the chapter.

c. Calculation of recyclability

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material'. This scenario represents the standard case.
2. If one or more design parameters are categorised as 'requiring examination', it must be determined whether they result in design-related valuable material losses. If such losses can be ruled out through examination, the parameter has no impact on the calculation in accordance with paragraph 1. Otherwise, design-related losses must be determined and deducted.
3. If one or more design parameters are categorised under 'incompatibilities', recyclability is 0 %.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

No individual evidence for the existence of a recycling infrastructure is required to establish recyclability; if PE, PP and aluminium components are claimed as valuable material, individual evidence of polyAl recycling in accordance with Annex 3.3 is recommended.

Liquid packaging board | Reference application: Corrugated base paper (fibre share) and injection moulding products (PO share) and aluminium casting or deoxidising agent (Al share)						
Main body						
			Valuable material	**Incompatibilities[16]**	**Separable or conditionally compatible**	**Examination of design-related valuable material losses**
Main body	**Material**	Cardboard	X			
		PE[1]	X			
		PET			X	
		PP[1]	X			
		Aluminium foil[1]	X			
	Materials in multilayer films, Density < 1 g/cm³	Biodegradable and compostable materials as a layer		X		
		COC layer[1]	X			
		EVOH layer			X	
		Ionomer layer (non-specific)			X	
		PA layer (non-specific)		X		
		Polyamide 6 or co-polyamide 6-66 in co-extruded PE/PA films (with or without EVOH), combined with MAH-grafted PE as an adhesion promoter at a ratio of at least 0.5 g of adhesive per 1 g of PA (+EVOH)			X	
		Polyamide 6 in laminated PE/PA films, combined with MAH-grafted PE as a compatibiliser at a ratio of at least 0.15 g of compatibiliser per 1 g of PA			X	
		PE layer (non-specific)[1]	X			
		HDPE layer[1]	X			
		MDPE layer[1]	X			
		LDPE layer[1]	X			
		LLDPE layer[1]	X			
		mPE (metallocene) layer[1]	X			
		PET layer in combination with PE (PET/PE composite)		X		
		PP layer[1]	X			
		Other non-PO plastics		X		
		Non-polymeric layers (excluding aluminium foil and SiOx/AlOx/metallisation)		X		
	Materials in multilayer films, Density > 1 g/cm³	Plastic multilayer film, density > 1 g/cm³			X	P5

[16] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[17]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Other finishing (of the paper)	Dry strength agent: PVOH	X			P6.2
		Dry strength agent: Starch (mass and surface)	X			
		Dry strength agent: Other synthetic polymers	X			P6.2
		Sizing agent, hydrophobic (mass and surface)	X			
		Wet strength agent, impregnating agent	X			P6.2
		Mineral fillers	X			
		Other finishing	X			
	Barriers and surface finish (of the paper)	Metallisation			X	
		Mineral pigment coating incl. binding agent	X[2]			
		Polymer dispersion coating (thermoplastic)		X		P8
		Polymer mineral coating (thermoplastic)		X		P8
		Silicone coating			X	P6.2
		Paraffin, wax, oil			X	P6.2
		Other surface finish		X		P6.2, P8
	Additives and coatings (of the plastic layer)	AlOx			X	
		Metallisation			X	
		SiOx			X	
		Other additives and coatings		X		
	Adhesive in multilayer structure	Dispersion adhesive			X	
		Hot-melt adhesive application, criteria of EPRC scorecard fulfilled			X	
		Hot-melt adhesive application, criteria of EPRC scorecard not fulfilled		X		P8
		Starch-based adhesive	X			
	Decoration	Direct printing, with substances on the EuPIA exclusion list		X		
		Direct printing, without substances on the EuPIA exclusion list			X	
		Foil stamping			X	
		Lacquer			X	

[17] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

Ancillary components						
			Valuable material	Incompatibilities[18]	Separable or conditionally compatible	Examination of design-related valuable material losses
Closure	Material	PE[1]	X			P5
		PET			X	
		POM			X	
		PP[1]	X			P5
		PS			X	
		Non-PO plastics, density < 1 g/cm³		X		
		Other plastic			X	
Other design parameters						
Other design parameters	PFAS	PFAS share in food-contact packaging ≥ limit value according to Article 5 (5) PPWR		X		
	Structure	Design different from standard structure (no wet-strength cardboard, PE ± aluminium)				P2
	Decoration	Metal pigments applied on a large scale (taking up > 50% of the projected surface) (lacquering, print, coating or embossing)				P2
		> 50% fully printed black (including background) using carbon black				P2

[1] Individual evidence in accordance with Annex 3.3 is recommended to allow for a categorisation as valuable material.
[2] Mineral pigment coatings including binding agents without a sealing function and without a function as a water vapour, oxygen or grease barrier must be counted towards the valuable material share.

Examination of design-related valuable material losses	
P2	Testing required to determine if identifiability, including targeted separability, is given in a sensor-based sorting context. Restrictions must be taken into account as proportionate losses of valuable material.
P5	Only the packaging components containing valuable material that have a verified density of less than 1 g/cm³ (including additives, masterbatches, fillers, or in multilayer structures as well as printing inks) must be counted towards the available valuable material share.
P6.2	If wet-strength agents, impregnating agents, waxes, etc., are used for fibre-based packaging, and in the case of paper or cardboard (excluding liquid packaging board) coated or metallised on both sides, the determination of recyclability needs to be based on a suitable testing methodology. The non-recoverable fibrous material share must be deducted to determine the available valuable material share. If, during the pulping of fibre-based packaging, substances that cannot be classified as fibrous material pass into the aqueous phase (water-soluble, colloidally dissolved or finely dispersed), these must be quantified by a suitable testing method and deducted when calculating the fibrous material recovery rate.
P8	For any deviating determination in the sense that incompatible substances do not negatively affect recyclability in individual cases, individual evidence produced through analytical testing[19] must be provided. Requirements for the implementation and documentation of individual evidence are specified in Annex 3.1.

[18] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

[19] The *sheet adhesion test and visual appearance test of the accept of the coarse screening* (cf. 8.5 of the *Paper and Board – Recyclability Laboratory Test Method* published by CEPI) is a method recognised in the context of this minimum standard.

A 2.3b Composite packaging of which the majority is paper/cardboard (excluding liquid packaging board)

a. Scope of application

The following determination principles, criteria and requirements apply to packaging with paper/cardboard as the main material. Examples include: laminated folding boxes, composite cans, coated papers, paper cups coated on both sides, wrappers.

b. Categorisation of design parameters, including examination and testing requirements

The most common design parameters of paper/cardboard packaging are listed below in a table, assigned to the columns 'valuable material', 'incompatibilities', 'separable or conditionally compatible', and 'examination of design-related valuable material losses'. The last categorisation mentioned may also be additive and refers to the corresponding examination or determination requirement in the lower section of the table at the end of the chapter.

c. Calculation of recyclability

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material'. This scenario represents the standard case.
2. If one or more design parameters are categorised as 'requiring examination', it must be determined whether they result in design-related valuable material losses. If such losses can be ruled out through examination, the parameter has no impact on the calculation in accordance with paragraph 1. Otherwise, design-related losses must be determined and deducted.
3. If one or more design parameters are categorised under 'incompatibilities', recyclability is 0 %.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

Individual evidence for the existence of a recycling infrastructure is recommended to establish recyclability.

Composite packaging of which the majority is paper/cardboard (excluding liquid packaging board) | Reference application: Corrugated base paper						
Main body						
			Valuable material	Incompatibilities[20]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Material	Corrugated board	X			
		Kraft paper	X			
		Moulded pulp, highly compressed	X			P6.2
		Moulded pulp, slightly compressed	X			
		Glassine	X			
		Bogus paper	X			
		Wrapping tissue	X			
		Bitumen paper		X		
		Oil paper		X		
		Wax/paraffin paper		X		
		Paper/cardboard, other sorts	X			
		Foamed, extruded, thermoformed component made of starch			X	
		Aluminium lamination			X	P0.1
		Plastic film (extrusion lamination, film lamination)			X	
	Dyeing	Dyed black, using carbon black				P2
	Other finishing (of the paper)	Dry strength agent: PVOH	X			P6.2
		Dry strength agent: Starch (mass and surface)	X			
		Dry strength agent: Other synthetic polymers	X			P6.2
		Sizing agent, hydrophobic (mass and surface)	X			
		Wet strength agent, impregnating agent	X			P6.2
		Mineral fillers	X			
		Other finishing	X			
	Barriers and surface finish (of the paper)	Metallisation			X	
		Mineral pigment coating incl. binding agent	X			
		Polymer dispersion coating (thermoplastic)		X		P8
		Polymer mineral coating (thermoplastic)		X		P8
		Silicone coating			X	P6.2
		Paraffin, wax, oil			X	P6.2
		Other surface finish		X		P6.2, P8

[20] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[21]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Additives and coatings (of the plastic layer)	AlOx			X	
		Metallisation			X	
		SiOx			X	
	Adhesive in multilayer structure	Dispersion adhesive			X	
		Hot-melt adhesive application, criteria of EPRC scorecard fulfilled			X	
		Hot-melt adhesive application, criteria of EPRC scorecard not fulfilled		X		P8
		Starch-based adhesive	X			
	Decoration	Direct printing, with substances on the EuPIA exclusion list		X		
		Direct printing, without substances on the EuPIA exclusion list			X	
		Foil stamping			X	
		Lacquer			X	
		Fully lacquered surface - excluding clear protective lacquer up to a thickness of ≤ 5 micrometers - excluding internal bag layers if the grammage is at least 100 g/m²				P2
Ancillary components						
			Valuable material	**Incompatibilities[2121]**	**Separable or conditionally compatible**	**Examination of design-related valuable material losses**
Label	Material	Paper (not equipped with wet strength agent)	X			
		Paper (equipped with wet strength agent)	X			P6.2
		Plastic			X	
	Adhesive	Dispersion adhesive			X	
		Hot-melt adhesive application, criteria of EPRC scorecard fulfilled			X	
		Hot-melt adhesive application, criteria of EPRC scorecard not fulfilled		X		P8
		Starch-based adhesive	X			
	Decoration	Direct printing, with substances on the EuPIA exclusion list		X		
		Direct printing, without substances on the EuPIA exclusion list			X	
		Lacquer			X	

[21] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[22]	Separable or conditionally compatible	Examination of design-related valuable material losses
Seam adhesion/ attachment	**Adhesive**	Dispersion adhesive			X	
		Hot-melt adhesive application, criteria of EPRC scorecard fulfilled			X	
		Hot-melt adhesive application, criteria of EPRC scorecard not fulfilled		X		P8
		Starch-based adhesive	X			
Ancillary component (not fibre-based)	**Material**	Cellophane			X	
		Plastic (non-specific)			X	
		PVOH			X	
		Non-ferrous metal, stainless steel, magnetic materials, steel			X	P0.1, P0.2
Other design parameters						
Other design parameters	**PFAS**	PFAS share in food-contact packaging ≥ limit value according to Article 5 (5) PPWR		X		
	Structure	Plastic-coated surface - excluding internal bag layers if the grammage is at least 100 g/m²				P2
	Decoration	Metal pigments applied on a large scale (taking up > 50% of the projected surface) (lacquering, print, coating or embossing)				P2
		> 50% fully printed black (including background) using carbon black				P2
	Double-sided barrier coating					P6.2
	Contents	Non-dry contents – i.e. fibre-based packaging for example for liquids, certain foodstuffs, oils and emulsions				P6.1
* Mineral pigment coatings including binding agents without a sealing function and without a function as a water vapour, oxygen or grease barrier must be counted towards the valuable material share.						

Examination of design-related valuable material losses	
P0.1	Presence of an aluminium foil layer: examination required (test if necessary) whether the design causes sorting into aluminium fraction. If so, a complete loss of valuable material for packaging category 3 has to be assumed.
P0.2	Presence of ferromagnetic components ≥ 5% by weight in relation to the object of determination: examination required (test if necessary) whether the design causes sorting into ferrous metal fraction. If so, a complete loss of valuable material for packaging category 3 has to be assumed.
P2	Testing required to determine if identifiability, including targeted separability, is given in a sensor-based sorting context. Restrictions must be taken into account as proportionate losses of valuable material.

[22] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

P6.1	When determining the recyclability of fibre-based packaging, the gradual defiberability of the fibrous material is a decisive factor. In the case of composite packaging of which the majority is paper/cardboard (excluding liquid packaging board) for non-dry contents – i.e. fibre-based packaging for example for liquids, certain foodstuffs, oils and emulsions – evidence must be provided that the operating conditions (for example, dwell time and other operating parameters in the processing of the material) of the respective recovery path (paper/cardboard or lightweight packaging collection) result in the dispersion of the fibrous material, and that the fibrous material is recycled. This obligation to provide evidence does not apply to fibre-based packaging that is typically filled with contents that are dry (< 15% moisture content), free-flowing or particulate, such as flour or sugar. If, during the pulping of fibre-based packaging, substances that cannot be classified as fibrous material pass into the aqueous phase (water-soluble, colloidally dissolved or finely dispersed), these must be quantified by a suitable testing method and deducted when calculating the fibrous material recovery rate.
P6.2	If wet-strength agents, impregnating agents, waxes, etc., are used for fibre-based packaging, and in the case of paper or cardboard (excluding liquid packaging board) coated or metallised on both sides, the determination of recyclability needs to be based on a suitable testing methodology. The non-recoverable fibrous material share must be deducted to determine the available valuable material share. If, during the pulping of fibre-based packaging, substances that cannot be classified as fibrous material pass into the aqueous phase (water-soluble, colloidally dissolved or finely dispersed), these must be quantified by a suitable testing method and deducted when calculating the fibrous material recovery rate.
P8	For any deviating determination in the sense that incompatible substances do not negatively affect recyclability in individual cases, individual evidence produced through analytical testing[23] must be provided. Requirements for the implementation and documentation of individual evidence are specified in Annex 3.1.
Scope of application of design parameters categorised as P	
P0.1	The criterion explicitly does not apply to metallised packaging.
P2	Explicitly not applicable to large-format transport packaging (e.g. cartons).

[23] The *sheet adhesion test and visual appearance test of the accept of the coarse screening* (cf. 8.5 of the *Paper and Board – Recyclability Laboratory Test Method* published by CEPI) is a method recognised in the context of this minimum standard.

A 2.4 Steel and composite packaging of which the majority is steel

a. Scope of application

The following determination principles, criteria and requirements apply to packaging with steel as the main material. Examples include: food cans, aerosol cans, paint and colour cans, metal buckets.

b. Categorisation of design parameters, including examination and testing requirements

The most common design parameters of tinplate and sheet metal packaging are listed below in a table, assigned to the columns 'valuable material', 'incompatibilities', 'separable or conditionally compatible', and 'examination of design-related valuable material losses'. The last categorisation mentioned may also be additive and refers to the corresponding examination or determination requirement in the lower section of the table at the end of the chapter.

c. Calculation of recyclability

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material'. This scenario represents the standard case.
2. If one or more design parameters are categorised as 'requiring examination', it must be determined whether they result in design-related valuable material losses. If such losses can be ruled out through examination, the parameter has no impact on the calculation in accordance with paragraph 1. Otherwise, design-related losses must be determined and deducted.
3. If one or more design parameters are categorised under 'incompatibilities', recyclability is 0 %.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

No individual evidence for the existence of a recycling infrastructure is required to establish recyclability.

Steel and composite packaging of which the majority is steel | Reference application: Steel products						
Main body						
			Valuable material	**Incompatibilities[24]**	**Separable or conditionally compatible**	**Examination of design-related valuable material losses**
Main body	**Material**	Steel (non-specific)	X			
		Steel, chrome-plated	X			
		Steel, tin-plated	X			
		Aluminium	X			
		Plastic			X	
		Paper			X	
	Printing, lacquer and coatings	Direct printing			X	
		Lacquer (inner and external lacquer)			X	
		Other			X	
Ancillary components						
			Valuable material	**Incompatibilities[24]**	**Separable or conditionally compatible**	**Examination of design-related valuable material losses**
Closure/ functional head	**Material**	Steel (non-specific)	X			
		Steel, chrome-plated	X			
		Steel, tin-plated	X			
		Stainless steel	X			
		Aluminium	X			
		Non-ferrous metal, other	X			
		Glass			X	
		Plastic			X	
		Other			X	
Label	**Material**	Plastic			X	
		Paper			X	
		Other material			X	
	Adhesive application	Adhesive application			X	
	Decoration	Printing ink			X	
		Foil stamping			X	
		Lacquer			X	

[24] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

A 2.5/2.6 Aluminium and composite packaging of which the majority is aluminium – rigid, semi-rigid and flexible

a. Scope of application

The following determination principles, criteria and requirements apply to packaging with aluminium as the main material. Examples include: food cans, aerosol cans, aluminium trays and aluminium tubes.

b. Categorisation of design parameters, including examination and testing requirements

The most common design parameters of aluminium packaging are listed below in a table, assigned to the columns 'valuable material', 'incompatibilities', 'separable or conditionally compatible', and 'examination of design-related valuable material losses'. The last categorisation mentioned may also be additive and refers to the corresponding examination or determination requirement in the lower section of the table at the end of the chapter.

c. Calculation of recyclability

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material'. This scenario represents the standard case.
2. If one or more design parameters are categorised as 'requiring examination', it must be determined whether they result in design-related valuable material losses. If such losses can be ruled out through examination, the parameter has no impact on the calculation in accordance with paragraph 1. Otherwise, design-related losses must be determined and deducted.
3. If one or more design parameters are categorised under 'incompatibilities', recyclability is 0 %.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

No individual evidence for the existence of a recycling infrastructure is required to establish recyclability.

Aluminium and composite packaging of which the majority is aluminium – rigid, semi-rigid and flexible | Reference application: Aluminium casting						
Main body						
			Valuable material	**Incompatibilities[25]**	**Separable or conditionally compatible**	**Examination of design-related valuable material losses**
Main body	**Material**	Aluminium	X			
		Non-ferrous metal, other	X			P3
		Plastic			X	
		Paper			X	
		Steel (non-specific)	X			
		Steel, chrome-plated	X			
		Steel, tin-plated	X			
	Printing, lacquer and coatings	Direct printing			X	
		Lacquer (inner and external lacquer)			X	
		Other			X	
Ancillary components						
			Valuable material	**Incompatibilities[25]**	**Separable or conditionally compatible**	**Examination of design-related valuable material losses**
Closure/ functional head	**Material**	Aluminium	X			
		Glass			X	
		Plastic			X	
		Non-ferrous metal, other	X			
		Stainless steel	X			
		Steel (non-specific)	X			
		Steel, chrome-plated	X			
		Steel, tin-plated	X			
		Other			X	
Label	**Material**	Plastic			X	
		Paper			X	
		Other material			X	
	Adhesive application	Adhesive application			X	
	Decoration	Printing ink			X	
		Foil stamping			X	
		Lacquer			X	
Other design parameters						
Other design parameters	**PFAS**	PFAS share in food-contact packaging ≥ limit value according to Article 5 (5) PPWR		X		

[25] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

Examination of design-related valuable material losses	
P3	Examination of effective electrical conductivity (eddy current separator test): non-sortable packaging must be regarded as having a recyclability of 0%.
Scope of application of design parameters categorised as P	
P3	The criterion explicitly does not apply to metallised packaging and large-format transport packaging that is recycled as non-ferrous metal scrap via a separate mono-collection.

A 2.7 Bottles made of PET-A – rigid (transparent, clear/coloured)

a. Scope of application

The following determination principles, criteria and requirements apply to transparent PET bottles (clear/coloured). Opaque and transparent PET bottles must be determined pursuant to category 2.8b.

b. Categorisation of design parameters, including examination and testing requirements

The most common design parameters of transparent PET bottles are listed below in a table, assigned to the columns 'valuable material', 'incompatibilities', 'separable or conditionally compatible', and 'examination of design-related valuable material losses'. The last categorisation mentioned may also be additive and refers to the corresponding examination or determination requirement in the lower section of the table at the end of the chapter.

c. Calculation of recyclability

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material'. This scenario represents the standard case.
2. If one or more design parameters are categorised as 'requiring examination', it must be determined whether they result in design-related valuable material losses. If such losses can be ruled out through examination, the parameter has no impact on the calculation in accordance with paragraph 1. Otherwise, design-related losses must be determined and deducted.
3. If one or more design parameters are categorised under 'incompatibilities', recyclability is 0 %.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

No individual evidence for the existence of a recycling infrastructure is required to establish recyclability.

Bottles made of PET-A – rigid (transparent, clear/coloured)[26] | Reference application: Bottles (contact-sensitive) or thermoforms (contact-sensitive)						
Main body						
			Valuable material	**Incompati-bilities[27]**	**Separable or condition-ally compati-ble**	**Examination of design-related valuable material losses**
Main body	**Material**	PET-A	X			
		PET-G		X		
		rPET	X			
		EVOH layer		X		
		PA layer		X		
	Material in multilayer, density < 1 g/cm³	Multilayer structure, density < 1 g/cm³			X	P5
	Structure	Multilayer structure				P2
	Masterbatch or colour batch	Masterbatch, colour batch (transpar-ent)	X			
		Dyeing using carbon black (also when used for internal layers)				P2
	Additives	AA-blocker	X			
		Anti-block	X			
		Nanocomposites	X			
		Oxygen scavenger (PA free)	X			
		PA additivation		X		
		UV stabilisers	X			
		Other blended barriers		X		
	Coating	AlOx			X	
		Anti-fog coating			X	
		EVOH coating		X		
		SiOx			X	
	Decoration	Direct printing (excluding production codes, 'best before' dates and UFI codes)		X		

[26] Opaque and transparent PET bottles must be determined pursuant to category 2.8b.

[27] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

Ancillary components						
			Valuable material	Incompatibilities[28]	Separable or conditionally compatible	Examination of design-related valuable material losses
Closure/ functional head	Material	Rigid HDPE, rHDPE from closures and functional elements	X			P5
		Rigid PP, rPP from closures and functional elements	X			P5
		PA (e.g. in applicators)		X		
		PEF from closures and functional elements	X			
		Aluminium		X		
		Glass			X	
		High-alloy steels, non-ferromagnetic		X		
		Steel, ferromagnetic			X	P0.2
		Elastomer components, density > 1 g/cm³		X		
Label/ sleeve	Material	Mono/multilayer film incl. print and lacquer, density > 1 g/cm³		X		
		Mono/multilayer film incl. print and lacquer, density < 1 g/cm³			X	
		Paper label (not wet-strength/wet-strength equipped)			X	
	Coverage	Large labels (taking up > 50% of the projected surface) made from non-valuable material				P2
		Full sleeve labels (excluding full sleeves of PET hollow bodies without a light barrier – clear or light blue – where OPS, PET or PO sleeves are used)				P2
Label	Adhesive application	Adhesive application (wash-off capability unknown)		X		
		Adhesive application (wash-off-able in alkaline hot wash, 80 °C)			X	
		Adhesive application (not wash-off-able in alkaline hot wash, 80 °C)		X		
Other design parameters						
Other design parameters	Structure	Different types of plastic used on front and back sides				P2
	Decoration	> 50% fully printed black (including background) using carbon black				P2
		Metal pigments applied on a large scale (taking up > 50% of the projected surface) (lacquering, coating or embossing)				P2
	PFAS	PFAS share in food-contact packaging ≥ limit value according to Article 5 (5) PPWR		X		

[28] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

Examination of design-related valuable material losses	
P0.2	Presence of ferromagnetic components ≥ 5% by weight in relation to the object of determination: examination required (test if necessary) whether the design causes sorting into ferrous metal fraction. If so, a complete loss of valuable material for packaging category 7 has to be assumed.
P2	Testing required to determine if identifiability, including targeted separability, is given in a sensor-based sorting context. Restrictions must be taken into account as proportionate losses of valuable material.
P5	Only valuable material shares made of PET that have a verified density of more than 1 g/cm³ (including additives, masterbatches, fillers or in multilayer structures as well as printing inks) must be counted towards the available valuable material share. Only valuable material shares made of PO that have a verified density of less than 1 g/cm³ (including additives, masterbatches, fillers, or in multilayer structures as well as printing inks) must be counted towards the available valuable material share.
P8	For any deviating determination in the sense that incompatible substances do not negatively affect recyclability in individual cases, individual evidence produced through analytical testing must be provided. Requirements for the implementation and documentation of individual evidence are specified in Annex 3.1.
Scope of application of design parameters categorised as P	
P2	Explicitly not applicable to large-format transport packaging and to plastic packaging for which a separate plastic-type-only mono-collection is a requirement for recycling (e.g. reusable packaging in deposit systems, etc.).

A 2.8a Thermoforms made of PET-A and PET-C – rigid (transparent clear/coloured, opaque)

a. Scope of application

The following determination principles, criteria and requirements apply to packaging with PET as the main material. Examples include: trays, snap-on caps, cups, blisters and other thermoforms.

b. Categorisation of design parameters, including examination and testing requirements

The most common design parameters of thermoforms made of PET-A and PET-C are listed below in a table, assigned to the columns 'valuable material', 'incompatibilities', 'separable or conditionally compatible', and 'examination of design-related valuable material losses'. The last categorisation mentioned may also be additive and refers to the corresponding examination or determination requirement in the lower section of the table at the end of the chapter.

c. Calculation of recyclability

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material'. This scenario represents the standard case.
2. If one or more design parameters are categorised as 'requiring examination', it must be determined whether they result in design-related valuable material losses. If such losses can be ruled out through examination, the parameter has no impact on the calculation in accordance with paragraph 1. Otherwise, design-related losses must be determined and deducted.
3. If one or more design parameters are categorised under 'incompatibilities', recyclability is 0 %.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

Individual evidence for the existence of a recycling infrastructure is required to establish recyclability.

Thermoforms made of PET-A and PET-C – rigid (transparent, clear/coloured, opaque) | Reference application: Thermoforms (contact-sensitive)						
Main body						
			Valuable material	Incompatibilities[29]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Material	PET-A	X			
		PET-A opaque	X			
		PET-C	X			
		PET-G		X		
		rPET	X			
		PEF	X			
		PBT	X			
	Material in multilayer, density > 1 g/cm³	Aluminium foil layer		X		P0.1
		EVOH layer		X		
		PA layer		X		
		PBT layer	X			
		PE layer			X	
		PE-X layer		X		
		PE peel layer (non-specific)		X		
		PEF layer	X			
		PP layer		X		
		PP peel layer (non-specific)		X		
		PVDC layer		X		
		PVOH layer		X		
	Material in multilayer, density < 1 g/cm³	Multilayer structure, density < 1 g/cm³			X	P5
	Structure	Multilayer structure				P2
	Masterbatch or colour batch	Masterbatch, colour batch	X			
		Dyeing using carbon black (also when used for internal layers)				P2
	Fillers, mineral additives and absorbers	Absorber (mineral)	X			
		Lime, chalk	X			
		Talc	X			
		Titanium dioxide	X			
	Additives	AA-blocker	X			
		Anti-block	X			
		Bio-/oxo-/photodegradable additives		X		
		Nanocomposite	X			
		Oxygen scavenger (PA free)	X			
		PA additivation		X		
		Slip additive	X			

[29] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[30]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Additives	UV stabilisers	X			
		Other blended barriers		X		
	Coating	Acrylic-based coating		X		
		AlOx			X	
		EVOH coating		X		
		PVOH coating		X		
		Sealing edge coating (wash-off-able in hot wash, 80 °C)			X	
		Sealing edge coating (not wash-off-able in hot wash, 80 °C)		X		
		SiOx			X	
		Other coatings		X		P8
	Adhesive application	Adhesive		X		P8
	Decoration	Direct printing (excluding production codes, 'best before' dates and UFI codes)		X		
Ancillary components						
			Valuable material	Incompatibilities[3030]	Separable or conditionally compatible	Examination of design-related valuable material losses
Label/ sealing film	Material	Monolayer film/coextruded multilayer film made of PET (except PET-G), density > 1 g/cm³, unprinted and not lacquered	X			
		Multilayer film made of PET, adhesive-laminated, density > 1 g/cm³, unprinted and not lacquered		X		P8
		Coextruded multilayer film made of PET (except PET-G)/PE, unprinted and not lacquered			X	
		Mono/multilayer film incl. print and lacquer, density > 1 g/cm³		X		
		Mono/multilayer film incl. print and lacquer, density < 1 g/cm³, removable without residue in alkaline hot wash, 80 °C			X	
		Mono/multilayer film incl. print and lacquer, density < 1 g/cm³, not removable without residue in alkaline hot wash, 80 °C		X		
		Paper label (not wet-strength/wet-strength equipped)			X	
	Coverage	Large labels (taking up > 50% of the projected surface) made from non-valuable material				P2

[30] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[31]	Separable or conditionally compatible	Examination of design-related valuable material losses
Sealing film	Additives in PET-A and PET-C	AA-blocker	X			
		Anti-block	X			
		Nanocomposite	X			
		Oxygen scavenger (PA free)	X			
		PA additivation		X		
		UV stabilisers	X			
		Other blended barriers		X		
	Coating	Acrylic-based coating		X		
		AlOx			X	
		SiOx			X	
		Other coatings		X		P8
Absorbent pad/ bubble pad	Material	Absorbent			X	
		PE, density < 1 g/cm³			X	
		PP, density < 1 g/cm³			X	
		XPS, density < 1 g/cm³			X	
		Cellulose			X	
Label/ absorbent pad/ bubble pad	Adhesive application	Adhesive application (wash-off capability unknown)		X		P8
		Adhesive application (wash-off-able in alkaline hot wash, 80 °C)			X	
		Adhesive application (not wash-off-able in alkaline hot wash, 80 °C)		X		
Other design parameters						
Other design parameters	Structure	Different types of plastic used on front and back sides				P2
	Decoration	> 50% fully printed black (including background) using carbon black				P2
		Metal pigments applied on a large scale (taking up > 50% of the projected surface) (lacquering, coating or embossing)				P2
	PFAS	PFAS share in food-contact packaging ≥ limit value according to Article 5 (5) PPWR		X		

Examination of design-related valuable material losses	
P0.1	Presence of an aluminium foil layer: examination required (test if necessary) whether the design causes sorting into aluminium fraction. If so, a complete loss of valuable material for packaging category 8 has to be assumed.
P2	Testing required to determine if identifiability, including targeted separability, is given in a sensor-based sorting context. Restrictions must be taken into account as proportionate losses of valuable material.
P5	Only valuable material shares made of PET that have a verified density of more than 1 g/cm³ (including additives, masterbatches, fillers or in multilayer structures as well as printing inks) must be counted towards the available valuable material share.

[31] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

P8	For any deviating determination in the sense that incompatible substances do not negatively affect recyclability in individual cases, individual evidence produced through analytical testing must be provided. Requirements for the implementation and documentation of individual evidence are specified in Annex 3.1.
Scope of application of design parameters categorised as P	
P0.1	The criterion explicitly does not apply to metallised packaging.
P2	Explicitly not applicable to large-format transport packaging.
P5	Explicitly not applicable to large-format transport packaging that is recycled via a separate mono-collection and whose recycling process does not include density separation.

A 2.8b Other packaging made of PET-A and PET-C – rigid (transparent clear/coloured, opaque)

a. Scope of application

The following determination principles, criteria and requirements apply to packaging with PET as the main material. Examples include: cans and jars.

b. Categorisation of design parameters, including examination and testing requirements

The most common design parameters of other PET packaging are listed below in a table, assigned to the columns 'valuable material', 'incompatibilities', 'separable or conditionally compatible', and 'examination of design-related valuable material losses'. The last categorisation mentioned may also be additive and refers to the corresponding examination or determination requirement in the lower section of the table at the end of the chapter.

c. Calculation of recyclability

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material'. This scenario represents the standard case.
2. If one or more design parameters are categorised as 'requiring examination', it must be determined whether they result in design-related valuable material losses. If such losses can be ruled out through examination, the parameter has no impact on the calculation in accordance with paragraph 1. Otherwise, design-related losses must be determined and deducted.
3. If one or more design parameters are categorised under 'incompatibilities', recyclability is 0 %.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

Individual evidence for the existence of a recycling infrastructure is required to establish recyclability.

Other packaging made of PET-A and PET-C – rigid (transparent, clear/coloured, opaque | Reference application: Thermoforms or strapping bands
Main body

			Valuable material	Incompatibilities[32]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Material	PET-A	X			
		PET-A opaque	X			
		PET-C not additionally nucleated	X			
		PET-G		X		
		r-PET	X			
		PEF	X			
		PBT	X			
	Material in multilayer, density > 1 g/cm³	Aluminium foil layer		X		P0.1
		EVOH layer		X		
		PA layer		X		
		PBT layer	X			
		PE layer			X	
		PE-X layer		X		
		PE peel layer (non-specific)		X		
		PEF layer	X			
		PP peel layer (non-specific)		X		
		PVDC layer		X		
		PVOH layer		X		
	Material in multilayer, density < 1 g/cm³	Multilayer structure, density < 1 g/cm³			X	P5
	Structure	Multilayer structure				P2
	Masterbatch or colour batch	Masterbatch, colour batch	X			
		Dyeing using carbon black (also when used for internal layers)				P2
	Fillers, mineral additives and absorbers	Absorber (mineral)	X			
		Lime, chalk	X			
		Talc	X			
		Titanium dioxide	X			
		Other fillers		X		

[32] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[33]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Additives	AA-blocker	X			
		Anti-block	X			
		Bio-/oxo-/photodegradable additives		X		
		Nanocomposite	X			
		Oxygen scavenger (PA free)	X			
		PA additivation			X	
		UV stabilisers	X			
		Other blended barriers		X		
	Coating	Acrylic-based coating		X		
		AlOx			X	
		Anti-fog coating			X	
		SiOx			X	
		Other coatings		X		P8
	Decoration	Direct printing (excluding production codes, 'best before' dates and UFI codes)		X		
		Lacquer		X		
Ancillary components						
			Valuable material	**Incompatibilities[33]**	**Separable or conditionally compatible**	**Examination of design-related valuable material losses**
Closure/ functional head	Material	Rigid HDPE, rHDPE from closures and functional elements	X			P5
		Rigid PP, rPP from closures and functional elements	X			P5
		Undecorated closure made of PET-A	X			
		Decorated closure made of PET-A		X		
		PA (e.g. in applicators)		X		
		Aluminium		X		
		Glass			X	
		Steel, ferromagnetic			X	P0.2
		High-alloy steels, non-ferromagnetic		X		
		Non-PET plastic (except HDPE or PP), foamed or filled, density < 1 g/cm³			X	
		Elastomer components, density > 1 g/cm³		X		
		Other polymer components, density > 1 g/cm³ (except PET-A)		X		P8

[33] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[34]	Separable or conditionally compatible	Examination of design-related valuable material losses
Label/ sleeve/ sealing film	Material	Monolayer film/coextruded multilayer film made of PET (except PET-G), density > 1 g/cm³, unprinted and not lacquered	X			
		Multilayer film made of PET, adhesive-laminated, density > 1 g/cm³, unprinted and not lacquered		X		
		Coextruded multilayer film made of PET (except PET-G)/PO, unprinted and not lacquered			X	
		Mono/multilayer film incl. print and lacquer, density > 1 g/cm³		X		
		Mono/multilayer film incl. print and lacquer, density < 1 g/cm³			X	
		Paper label (not wet-strength/wet-strength equipped)			X	
	Coverage	Large labels (taking up > 50% of the projected surface) made from non-valuable material				P2
		Full sleeve labels (excluding full sleeves of PET hollow bodies without a light barrier – clear or light blue – where OPS, PET or PO sleeves are used)				P2
Sealing film	Additives	AA-blocker	X			
		Anti-block	X			
		Bio-/oxo-/photodegradable additives		X		
		Nanocomposite	X			
		Oxygen scavenger (PA free)	X			
		PA additivation			X	
		UV stabilisers	X			
		Other blended barriers		X		
	Coating	Acrylic-based coating		X		
		AlOx			X	
		Metallisation			X	
		PVOH coating		X		
		SiOx			X	
		Other coatings		X		P8
Label	Adhesive application	Adhesive application (wash-off capability unknown)		X		
		Adhesive application (wash-off-able in alkaline hot wash, 80 °C)			X	
		Adhesive application (not wash-off-able in alkaline hot wash, 80 °C)		X		

[34] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

Other design parameters						
Other design parameters	**Structure**	Different types of plastic used on front and back sides				P2
	Decoration	> 50% fully printed black (including background) using carbon black				P2
		Metal pigments applied on a large scale (taking up > 50% of the projected surface) (lacquering, coating or embossing)				P2
	PFAS	PFAS share in food-contact packaging ≥ limit value according to Article 5 (5) PPWR		X		

Examination of design-related valuable material losses	
P0.1	Presence of an aluminium foil layer: examination required (test if necessary) whether the design causes sorting into aluminium fraction. If so, a complete loss of valuable material for packaging category 8 has to be assumed.
P0.2	Presence of ferromagnetic components ≥ 5% by weight in relation to the object of determination: examination required (test if necessary) whether the design causes sorting into ferrous metal fraction. If so, a complete loss of valuable material for packaging category 8 has to be assumed.
P2	Testing required to determine if identifiability, including targeted separability, is given in a sensor-based sorting context. Restrictions must be taken into account as proportionate losses of valuable material.
P5	Only valuable material shares made of PP and PE that have a verified density of less than 1 g/cm³ because of additives, fillers or multi-layering including printing inks must be counted towards the available valuable material share.
P8	For any deviating determination in the sense that incompatible substances do not negatively affect recyclability in individual cases, individual evidence produced through analytical testing must be provided. Requirements for the implementation and documentation of individual evidence are specified in Annex 3.1.

Scope of application of design parameters categorised as P	
P0.1	The criterion explicitly does not apply to metallised packaging.
P2	Explicitly not applicable to large-format transport packaging and to plastic packaging for which a separate plastic-type-only mono-collection is a requirement for recycling (e.g. reusable packaging in deposit systems, etc.).
P5	Explicitly not applicable to large-format transport packaging or to reusable packaging that is recycled via a separate mono-collection and whose recycling process does not include density separation.

A 2.9 PET – flexible (natural/coloured)

a. Scope of application

The following determination principles, criteria and requirements apply to flexible packaging with PET as the main material. Examples include: films, pouches, foams, stand-up pouches, carrier bags and wrapping films.

b. Categorisation of design parameters, including examination and testing requirements

No recycling paths exist for PET flexible plastic packaging subject to system participation. Consequently, design-for-recyclability requirements that could serve as determination principles cannot be derived.

c. Calculation of recyclability

Recyclability is 0 % unless individual evidence is provided.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

Individual evidence in accordance with Section 4 and Annex 3.3 is required to establish recyclability. Based on the verified recycling path, the design-for-recyclability criteria must be derived and applied to the object of determination.

A 2.10 PE – rigid (natural/coloured)

a. Scope of application

The following determination principles, criteria and requirements apply to packaging with PE as the main material. Examples include: bottles < 5 litres, cups, trays, blisters, tubes, cans, buckets ≤ 5 litres, canisters ≤ 5 litres, buckets > 5 litres, canisters > 5 litres.

b. Categorisation of design parameters, including examination and testing requirements

The most common design parameters of rigid plastic packaging made of PE are listed below in a table, assigned to the columns 'valuable material', 'incompatibilities', 'separable or conditionally compatible', and 'examination of design-related valuable material losses'. The last categorisation mentioned may also be additive and refers to the corresponding examination or determination requirement in the lower section of the table at the end of the chapter.

c. Calculation of recyclability

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material'. This scenario represents the standard case.
2. If one or more design parameters are categorised as 'requiring examination', it must be determined whether they result in design-related valuable material losses. If such losses can be ruled out through examination, the parameter has no impact on the calculation in accordance with paragraph 1. Otherwise, design-related losses must be determined and deducted.
3. If one or more design parameters are categorised under 'incompatibilities', recyclability is 0 %.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

No individual evidence for the existence of a recycling infrastructure is required to establish recyclability.

PE – rigid (natural/coloured) | Reference application: Blown film or injection moulding products
Main body

			Valuable material	Incompatibilities[35]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Material	HDPE	X			
		MDPE	X			
		LDPE	X			
		LLDPE	X			
		rPE	X			
		rPO	X			
		PE-PP blend	X			
		PE-X		X		
	Material in multilayer, density < 1 g/cm³	PE peel (non-specific)		X		
		PE-PB peel	X			
		PS-PE blend			X	
		Aluminium foil layer			X	P0.1, P5
		Biodegradable and compostable materials as a layer		X		
		COC layer	X			
		EVOH layer			X	
		Ionomer layer			X	
		PA layer		X		
		PAN layer		X		P8
		PB layer	X			
		mPE (metallocene) layer	X			
		PEN layer		X		P8
		PET layer		X		P8
		rPET layer		X		P8
		Plastomer (PE) layer	X			
		PP layer	X			
		PP-ethylene copolymer layer	X			
		rPP layer	X			
		PP peel layer (non-specific)		X		
		PP-PB peel layer	X			
		PVC layer		X		
		PVDC layer		X		
		PVOH layer		X		
	Material in multilayer, density > 1 g/cm³	Multilayer structure, density > 1 g/cm³			X	P5
	Structure	Multilayer structure (except PE-EVOH)				P2

[35] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[36]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Masterbatch or colour batch	Masterbatch, colour batch	X			
		Dyeing using carbon black (also when used for internal layers)				P2
	Fillers, mineral additives and absorbers	Absorber (mineral)	X			P5
		Lime, chalk	X			P5
		Talc	X			P5
		Titanium dioxide	X			P5
	Additives	Additives in valuable material	X			
	Coating	AlOx			X	
		Metallisation			X	P2
		PVOH coating		X		
		SiOx			X	
		Other coatings		X		P8
	Tie layer, adhesive application	MAH-grafted LDPE or LLDPE	X			
		Adhesive and other tie layer			X	
	Decoration	Direct printing			X	
		Lacquer			X	

Ancillary components

			Valuable material	Incompatibilities[36]	Separable or conditionally compatible	Examination of design-related valuable material losses
Closure/ functional head/ valve	Material	HDPE, MDPE, LDPE, LLDPE, rPE	X			
		Elastomer, rubber (non-thermoplastic), density < 1 g/cm³		X		
		Elastomer (thermoplastic), density < 1 g/cm³			X	
		Ionomer			X	
		PA in applicators with density < 1 g/cm³		X		
		PB	X			
		PET			X	
		PET (foamed, density < 1 g/cm³)		X		P8
		rPET			X	
		PP	X			
		PP-ethylene copolymers	X			
		rPP	X			
		PS			X	
		rPS			X	
		PS-PE blend			X	
		PU, density < 1 g/cm³		X		

[36] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[37]	Separable or conditionally compatible	Examination of design-related valuable material losses
Closure/ functional head/ valve	Material	PVC			X	
		Silicone, density < 1 g/cm³		X		
		Other polymer components, density < 1 g/cm³		X		P8
		Aluminium			X	
		Stainless steel			X	
		Glass			X	
		Steel			X	P0.2
Label/ sleeve	Material	PE	X			
		PET (foamed, density < 1 g/cm³)		X		
		PP			X	
		Fibre-containing labels if the cellulose share can be removed by means of cold washing			X	
		Fibre-based labels if the cellulose share cannot be removed by means of cold washing.		X		
		Other materials	Categorisation in line with main body			
	Density	Label/sleeve, density > 1 g/cm³			X	
	Adhesive application	Adhesive			X	
	Decoration	Printing ink			X	
		Lacquer			X	
	Coverage	Large labels (taking up > 50% of the projected surface) made from non-valuable material				P2
		Full sleeve labels				P2
Sealing film	Material	Aluminium (sealing) lid, aluminium membrane			X	
		Other materials	Categorisation in line with main body			
	Density	Sealing film, density > 1 g/cm³				
	Additives	Additives in valuable material	X			P5
	Coating	AlOx			X	
		Metallisation			X	P2
		SiOx			X	
		Other coatings		X		P8
	Tie layer, adhesive application	MAH-grafted LDPE or LLDPE	X			
		Adhesive and other tie layer			X	
	Decoration	Direct printing			X	
		Lacquer			X	

[37] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

Other design parameters						
Other design parameters	**Structure**	Different types of plastic used on front and back sides				P2
	Decoration	> 50% fully printed black (including background) using carbon black				P2
		Metal pigments applied on a large scale (taking up > 50% of the projected surface) (lacquering, coating or embossing)				P2
	PFAS	PFAS share in food-contact packaging ≥ limit value according to Article 5 (5) PPWR		X		
	Sealant cartridges			X		

Examination of design-related valuable material losses	
P0.1	Presence of an aluminium foil layer: examination required (test if necessary) whether the design causes sorting into aluminium fraction. If so, a complete loss of valuable material for packaging category 10 has to be assumed.
P0.2	Presence of ferromagnetic components ≥ 5% by weight in relation to the object of determination: examination required (test if necessary) whether the design causes sorting into ferrous metal fraction. If so, a complete loss of valuable material for packaging category 10 has to be assumed.
P2	Testing required to determine if identifiability, including targeted separability, is given in a sensor-based sorting context. Restrictions must be taken into account as proportionate losses of valuable material.
P5	Only valuable material shares that have a verified density of less than 1 g/cm³ because of additives, fillers or multi-layering including printing inks must be counted towards the available valuable material share.
P8	For any deviating determination in the sense that incompatible substances do not negatively affect recyclability in individual cases, individual evidence produced through analytical testing must be provided. Requirements for the implementation and documentation of individual evidence are specified in Annex 3.1.

Scope of application of design parameters categorised as P	
P0.1	The criterion explicitly does not apply to metallised packaging.
P2	Explicitly not applicable to large-format transport packaging and to plastic packaging for which a separate plastic-type-only mono-collection is a requirement for recycling (e.g. packaging assigned to PPWR category 14, EPS, reusable packaging in deposit systems, etc.).
P5	Explicitly not applicable to large-format transport packaging or to reusable packaging such as crates for beverage bottles that are recycled via a separate mono-collection and whose recycling process does not include a density separation.

A 2.11 PE – flexible (natural/coloured)

a. Scope of application

The following determination principles, criteria and requirements apply to packaging with PE-flex as the main material. Examples include: flowpacks, films, bags, nets, foams, tubular bags, shrink films, stand-up pouches, carrier bags, bags, wrapping films, bubble wrap, pouches.

b. Categorisation of design parameters, including examination and testing requirements

The most common design parameters of flexible plastic packaging made of PE are listed below in a table, assigned to the columns 'valuable material', 'incompatibilities', 'separable or conditionally compatible', and 'examination of design-related valuable material losses'. The last categorisation mentioned may also be additive and refers to the corresponding examination or determination requirement in the lower section of the table at the end of the chapter.

c. Calculation of recyclability

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material'. This scenario represents the standard case.
2. If one or more design parameters are categorised as 'requiring examination', it must be determined whether they result in design-related valuable material losses. If such losses can be ruled out through examination, the parameter has no impact on the calculation in accordance with paragraph 1. Otherwise, design-related losses must be determined and deducted.
3. If one or more design parameters are categorised under 'incompatibilities', recyclability is 0 %.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

No individual evidence for the existence of a recycling infrastructure is required to establish recyclability; individual evidence is recommended for objects of determination with a format smaller than DIN A4.

PE – flexible (natural/coloured) | Reference application: Blown film and injection moulding products
Main body

			Valuable material	Incompatibilities[38]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Material	HDPE	X			
		MDPE	X			
		LDPE	X			
		LLDPE	X			
		rPE	X			
		PE-PP blend	X			
		PE-X (non-specific)		X		
		PE-X (≤ 50 kGy)	X			
		PE-X (> 50 kGy)		X		
		PE-PB peel	X			
		Aluminium foil layer		X		P0.1
		Biodegradable and compostable materials as a layer		X		
		COC layer	X			
		EVA layer (VA ≤ 15%)	X			
	Material in multilayer, density < 1 g/cm³	EVOH layer			X	
		Ionomer layer			X	
		Polyamide 6 or co-polyamide 6-66 in coextruded PE/PA films (with or without EVOH), combined with MAH-grafted PE as an adhesion promoter at a ratio of at least 0.5 g of adhesive per 1 g of PA (+EVOH)			X	
		Polyamide 6 in laminated PE/PA films, combined with MAH-grafted PE as a compatibiliser at a ratio of at least 0.15 g of compatibiliser per 1 g of PA			X	
		Other PA layers		X		
		PAN layer		X		
		PB layer	X			
		PET layer		X		
		rPET layer		X		
		PLA layer		X		
		Other non-polyolefin polymer layers		X		
		PP layer			X	
		PP-ethylene copolymer layer	X			
		PP terpolymer layer		X		
		rPP layer			X	
		PP peel layer		X		
		PS layer		X		

[38] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[39]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Material in multilayer, density < 1 g/cm³	rPS layer		X		
		PVC layer		X		
		PVDC layer		X		
		PVOH layer		X		
		Other non-PE polymer layer		X		
		Other non-polymer layer		X		
	Material in multilayer, density > 1 g/cm³	Multilayer structure (except PE-PE and PE-EVOH), density > 1 g/cm³			X	P5
	Masterbatch or colour batch	Masterbatch, colour batch	X			
		Dyeing using carbon black (also when used for internal layers)				P2
	Fillers, mineral additives and absorbers	Absorber (mineral)	X			P5
		Lime, chalk	X			P5
		Talc	X			P5
		Titanium dioxide	X			P5
	Additives	Additives in valuable material	X			
	Coating	AlOx			X	
		Metallisation (unless on the inside or middle layer)			X	P2
		PVOH coating		X		
		SiOx			X	
		Other coatings		X		P8
	Tie layer, adhesive application	MAH-grafted LDPE or LLDPE	X			
		Adhesive and other tie layer			X	
	Decoration	NC-, PU-, PVB-based binders in frontal printing			X	
		PU-, PVB-based binders in interlayer printing			X	
		NC-based binders in interlayer printing		X		

[39] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

Ancillary components						
			Valuable material	Incompatibilities[40]	Separable or conditionally compatible	Examination of design-related valuable material losses
Closure/ functional head/ valve	Material	HDPE, MDPE, LDPE, LLDPE, rPE	X			
		Elastomer, rubber (non-thermoplastic), density < 1 g/cm³		X		
		Elastomer (thermoplastic), density < 1 g/cm³			X	
		EVA (VA ≤ 15%)	X			
		PB	X			
		Ionomer			X	
		PA in applicators with density < 1 g/cm³		X		
		PET			X	
		PET (foamed, density < 1 g/cm³)		X		
		rPET			X	
		PP			X	
		PP-ethylene copolymers	X			
		PP terpolymers		X		
		rPP			X	
		PS			X	
		rPS			X	
		PU, density < 1 g/cm³		X		
		PVC			X	
		PVDC			X	
		Silicone, density < 1 g/cm³		X		
		Other polymer components, density < 1 g/cm³		X		P8
		Aluminium			X	
		Stainless steel			X	
		Glass			X	
		Steel			X	P0.2
Label	Material	PE	X			
		PP			X	
		Fibre-containing labels if the cellulose share can be removed by means of cold washing			X	
		Fibre-based labels if the cellulose share cannot be removed by means of cold washing.		X		
		Other materials	Categorisation in line with main body			
	Density	Label, density > 1 g/cm³			X	P5
	Adhesive application	Adhesive			X	
	Decoration	NC-, PU-, PVB-based binders in frontal printing			X	

[40] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[41]	Separable or conditionally compatible	Examination of design-related valuable material losses
Label	Decoration	PU-, PVB-based binders in interlayer printing			X	
		NC-based binders in interlayer printing		X		
		Lacquer			X	
	Coverage	Large labels (taking up > 50% of the projected surface) made from non-valuable material				P2
Other design parameters						
Other design parameters	Structure	Different types of plastic used on the front and back sides of the packaging				P2
		Multilayer structure (except PE-EVOH)				P2
	Decoration	> 50% fully printed black (including background) using carbon black				P2
		Metal pigments applied on a large scale (taking up > 50% of the projected surface) (lacquering, coating or embossing)				P2
	Nets					P2
	PFAS	PFAS share in food-contact packaging ≥ limit value according to Article 5 (5) PPWR		X		

Examination of design-related valuable material losses	
P0.1	Presence of an aluminium foil layer: examination required (test if necessary) whether the design causes sorting into aluminium fraction. If so, a complete loss of valuable material for packaging category 11 has to be assumed.
P0.2	Presence of ferromagnetic components ≥ 5% by weight in relation to the object of determination: examination required (test if necessary) whether the design causes sorting into ferrous metal fraction. If so, a complete loss of valuable material for packaging category 11 has to be assumed.
P2	Testing required to determine if identifiability, including targeted separability, is given in a sensor-based sorting context. Restrictions must be taken into account as proportionate losses of valuable material.
P5	Only the packaging components containing valuable material that have a verified density of less than 1 g/cm³ (including additives, masterbatches, fillers, or in multilayer structures as well as printing inks) must be counted towards the available valuable material share.
P8	For any deviating determination in the sense that incompatible substances do not negatively affect recyclability in individual cases, individual evidence produced through analytical testing must be provided. Requirements for the implementation and documentation of individual evidence are specified in Annex 3.1.

Scope of application of design parameters categorised as P	
P0.1	The criterion explicitly does not apply to metallised packaging.
P2	Explicitly not applicable to large-format transport packaging and to plastic packaging for which a separate plastic-type-only mono-collection is a requirement for recycling (e.g. stretch films (transport packaging)).
P5	Explicitly not applicable to large-format transport packaging that is recycled via a separate mono-collection and whose recycling process does not include density separation.

[41] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

A 2.12 PP – rigid (natural/coloured)

a. Scope of application

The following determination principles, criteria and requirements apply to packaging with PP as the main material. Examples include: bottles < 5 litres, cups, trays, blisters, tubes, cans, buckets ≤ 5 litres, canisters ≤ 5 litres, buckets > 5 litres, canisters > 5 litres.

b. Categorisation of design parameters, including examination and testing requirements

The most common design parameters of rigid plastic packaging made of PP are listed below in a table, assigned to the columns 'valuable material', 'incompatibilities', 'separable or conditionally compatible', and 'examination of design-related valuable material losses'. The last categorisation mentioned may also be additive and refers to the corresponding examination or determination requirement in the lower section of the table at the end of the chapter.

c. Calculation of recyclability

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material'. This scenario represents the standard case.
2. If one or more design parameters are categorised as 'requiring examination', it must be determined whether they result in design-related valuable material losses. If such losses can be ruled out through examination, the parameter has no impact on the calculation in accordance with paragraph 1. Otherwise, design-related losses must be determined and deducted.
3. If one or more design parameters are categorised under 'incompatibilities', recyclability is 0 %.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

No individual evidence for the existence of a recycling infrastructure is required to establish recyclability.

PP – rigid (natural/coloured) | Reference application: Injection moulding products or thermoforms
Main body

			Valuable material	Incompatibilities[42]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Material	PP	X			
		PP-ethylene copolymers	X			
		rPP	X			
	Material in multilayer, density < 1 g/cm³	PP peel (non-specific)		X		
		PP-PB peel	X			
		Aluminium foil layer			X	P0.1, P5
		Biodegradable and compostable materials as a layer		X		
		COC layer	X			
		EVOH layer			X	
		Ionomer layer			X	
		PA layer		X		
		PAN layer		X		P8
		PB layer	X			
		PE layer (non-specific)	X			
		HDPE layer	X			
		MDPE layer	X			
		LDPE layer	X			
		LLDPE layer	X			
		rPE layer	X			
		PE-PP blend layer	X			
		PE peel layer (non-specific)		X		
		PE-PB peel layer	X			
		PEN layer		X		P8
		PET layer		X		P8
		rPET layer		X		P8
		PS layer			X	
		rPS layer			X	
		PVC layer		X		
		PVDC layer		X		
		PVOH layer		X		
	Material in multilayer, density > 1 g/cm³	Multilayer structure, density > 1 g/cm³			X	P5
	Masterbatch or colour batch	Masterbatch, colour batch	X			
		Dyeing using carbon black (also when used for internal layers)				P2

[42] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[43]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Fillers, mineral additives and absorbers	Absorber (mineral)	X			P5
		Lime, chalk	X			P5
		Talc	X			P5
		Titanium dioxide	X			P5
		Other fillers		X		P5
	Additives	Additives in valuable material	X			
	Coating	AlOx			X	
		PVOH coating		X		
		SiOx			X	
		Other coatings		X		P8
	Tie layer, adhesive application	PE-based tie layer	X			
		PP-based tie layer	X			
		Adhesive			X	
	Decoration	Direct printing			X	
		Lacquer			X	
Ancillary components						
			Valuable material	Incompatibilities[43]	Separable or conditionally compatible	Examination of design-related valuable material losses
Closure/ functional head/ valve	Material	PP, PP-ethylene copolymers, rPP	X			
		Elastomer, rubber (non-thermoplastic), density < 1 g/cm³		X		
		Elastomer (thermoplastic), density < 1 g/cm³			X	
		Ionomer			X	
		PA in applicators with density < 1 g/cm³		X		
		PB	X			
		HDPE	X			
		MDPE	X			
		LDPE	X			
		LLDPE	X			
		rPE	X			
		PE-PP blend	X			
		PET			X	
		PET (foamed, density < 1 g/cm³)		X		
		rPET			X	
		PS			X	
		rPS			X	
		PU, density < 1 g/cm³		X		
		PVC		X		

[43] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[44]	Separable or conditionally compatible	Examination of design-related valuable material losses
Closure/ functional head/ valve	**Material**	PVDC		X		
		Silicone, density < 1 g/cm³		X		
		Non-PO plastics, density < 1 g/cm³		X		
		Aluminium			X	
		Stainless steel			X	
		Glass			X	
		Steel			X	P0.2
Label/ sleeve	**Material**	PE	X			
		PET (foamed, density < 1 g/cm³)		X		
		PP	X			
		Fibre-containing labels if the cellulose share can be removed by means of cold washing			X	
		Fibre-based labels if the cellulose share cannot be removed by means of cold washing.		X		
		Other materials	Categorisation in line with main body			
	Density	Label/sleeve, density > 1 g/cm³			X	P5
	Adhesive application	Adhesive			X	
	Decoration	Printing ink			X	
		Lacquer			X	
	Coverage	Large labels (taking up > 50% of the projected surface) made from non-valuable material				P2
		Full sleeve labels				P2
Sealing film	**Material**	Aluminium (sealing) lid*, aluminium membrane*	X			
		Other materials	Categorisation in line with main body			
	Density	Sealing film, density > 1 g/cm³			X	
	Additives	Additives in valuable material	X			P5
	Coating	AlOx			X	
		Metallisation			X	P2
		PVOH coating		X		
		SiOx			X	
		Other coatings		X		P8
	Tie layer, adhesive application	PE-based tie layer	X			
		PP-based tie layer	X			
		Adhesive			X	
	Decoration	Printing ink			X	
		Lacquer			X	

[44] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

Other design parameters						
Other design parameters	**Structure**	Different types of plastic used on front and back sides				P2
	Coating	Metallisation (unless on the inside or middle layer)			X	P2
		> 50% fully printed black (including background) using carbon black				P2
	Decoration	Metal pigments applied on a large scale (taking up > 50% of the projected surface) (lacquering, coating or embossing)				P2
	PFAS	PFAS share in food-contact packaging ≥ limit value according to Article 5 (5) PPWR		X		
	Sealant cartridges			X		
* Inclusion as a valuable material subject to individual evidence pursuant to Annex 3.3						

Examination of design-related valuable material losses	
P0.1	Presence of an aluminium foil layer: examination required (test if necessary) whether the design causes sorting into aluminium fraction. If so, a complete loss of valuable material for packaging category 12 has to be assumed.
P0.2	Presence of ferromagnetic components ≥ 5% by weight in relation to the object of determination: examination required (test if necessary) whether the design causes sorting into ferrous metal fraction. If so, a complete loss of valuable material for packaging category 12 has to be assumed.
P2	Testing required to determine if identifiability, including targeted separability, is given in a sensor-based sorting context. Restrictions must be taken into account as proportionate losses of valuable material.
P5	Only the packaging components containing valuable material that have a verified density of less than 1 g/cm³ (including additives, masterbatches, fillers, or in multilayer structures as well as printing inks) must be counted towards the available valuable material share.
P8	For any deviating determination in the sense that incompatible substances do not negatively affect recyclability in individual cases, individual evidence produced through analytical testing must be provided. Requirements for the implementation and documentation of individual evidence are specified in Annex 3.1.

Scope of application of design parameters categorised as P	
P0.1	The criterion explicitly does not apply to metallised packaging.
P2	Explicitly not applicable to large-format transport packaging and to plastic packaging for which a separate plastic-type-only mono-collection is a requirement for recycling (e.g. packaging assigned to PPWR category 14, EPS, reusable packaging in deposit systems, etc.).
P5	Explicitly not applicable to large-format transport packaging or to reusable packaging such as crates for beverage bottles that are recycled via a separate mono-collection and whose recycling process does not include a density separation.

A 2.13 PP – flexible (natural/coloured)

a. Scope of application

The following determination principles, criteria and requirements apply to packaging with PP-flex as the main material. Examples include: flowpacks, films, bags, nets, foams, tubular bags, shrink films, stand-up pouches, carrier bags, bags, wrapping films, bubble wrap, pouches.

b. Categorisation of design parameters, including examination and testing requirements

The most common design parameters of flexible plastic packaging made of PP are listed below in a table, assigned to the columns 'valuable material', 'incompatibilities', 'separable or conditionally compatible', and 'examination of design-related valuable material losses'. The last categorisation mentioned may also be additive and refers to the corresponding examination or determination requirement in the lower section of the table at the end of the chapter.

c. Calculation of recyclability

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material'. This scenario represents the standard case.
2. If one or more design parameters are categorised as 'requiring examination', it must be determined whether they result in design-related valuable material losses. If such losses can be ruled out through examination, the parameter has no impact on the calculation in accordance with paragraph 1. Otherwise, design-related losses must be determined and deducted.
3. If one or more design parameters are categorised under 'incompatibilities', recyclability is 0 %.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

While individual evidence for the existence of a recycling infrastructure is not required to establish recyclability, it is recommended.

PP – flexible (natural/coloured) | Reference application: Injection moulding products or thermoforms
Main body

			Valuable material	Incompatibilities[45]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Material	PP	X			
		PP-ethylene copolymers	X			
		rPP	X			
	Material in multilayer, density < 1 g/cm³	PP peel (non-specific)		X		
		PP-PB peel	X			
		Aluminium foil layer			X	P0.1, P5
		Biodegradable and compostable materials as a layer		X		
		COC layer	X			
		EVA layer (VA ≤ 15%)	X			
		EVOH layer			X	
		Ionomer layer			X	
		PA layer		X		
		PB layer	X			
		HDPE layer	X			
		MDPE layer	X			
		LDPE layer	X			
		LLDPE layer	X			
		rPE layer	X			
		PE-PP blend layer	X			
		PE peel layer (non-specific)		X		
		PE-PB peel layer	X			
		Other non-polyolefin polymer layers		X		P8
		PET layer		X		P8
		rPET layer		X		P8
		PS layer			X	
		rPS layer			X	
		PVC layer		X		
		PVDC layer		X		
		PVOH layer		X		
	Material in multilayer, density > 1 g/cm³	Multilayer structure (except PP-PP and PP-EVOH), density > 1 g/cm³			X	P5
	Structure	Multilayer structure (except PP-EVOH)				P2

[45] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[46]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Masterbatch or colour batch	Masterbatch, colour batch	X			
		Dyeing using carbon black (also when used for internal layers)				P2
	Fillers, mineral additives and absorbers	Absorber (mineral)	X			P5
		Lime, chalk	X			P5
		Talc	X			P5
		Titanium dioxide	X			P5
	Additives	Additives in valuable material	X			
	Coating	AlOx			X	
		Metallisation (unless on the inside or middle layer)			X	P2
		SiOx			X	
		PVOH coating		X		
		Other coatings		X		P8
	Tie layer, adhesive application	PE-based tie layer	X			
		PP-based tie layer	X			
		Adhesive			X	
	Decoration	Direct printing			X	
		Lacquer			X	
Ancillary components						
			Valuable material	Incompatibilities[46]	Separable or conditionally compatible	Examination of design-related valuable material losses
Closure/ functional head/ valve	Material	PP, PP-ethylene copolymers, rPP	X			
		Elastomer, rubber (non-thermoplastic), density < 1 g/cm³		X		
		Elastomer (thermoplastic), density < 1 g/cm³			X	
		EVA (VA ≤ 15%)	X			
		Ionomer			X	
		PA in applicators with density < 1 g/cm³		X		
		PB	X			
		HDPE	X			
		MDPE	X			
		LDPE	X			
		LLDPE	X			
		rPE	X			
		PE-PP blend	X			
		PET (foamed, density < 1 g/cm³)		X		P8

[46] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[47]	Separable or conditionally compatible	Examination of design-related valuable material losses
Closure/ functional head/ valve	Material	rPET			X	
		PS			X	
		rPS			X	
		PU, density < 1 g/cm³		X		
		PVC			X	
		PVDC			X	
		Silicone, density < 1 g/cm³		X		
		Other polymer components, density < 1 g/cm³		X		P8
		Aluminium			X	
		Stainless steel			X	
		Glass			X	
		Steel			X	P0.2
Label	Material	PE	X			
		PET (foamed, density < 1 g/cm³)		X		
		PP	X			
		Other foamed non-polyolefin components		X		
		Fibre-containing labels if the cellulose share can be removed by means of cold washing			X	
		Fibre-based labels if the cellulose share cannot be removed by means of cold washing.		X		
		Other materials	Categorisation in line with main body			
	Density	Label, density > 1 g/cm³			X	P5
	Metallisation	Metallisation			X	P2
	Adhesive application	Adhesive			X	
	Decoration	Printing ink			X	
		Lacquer			X	
	Coverage	Large labels (taking up > 50% of the projected surface) made from non-valuable material			X	

[47] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

Other design parameters						
Other design parameters	Structure	Different types of plastic used on front and back sides				P2
	Decoration	> 50% fully printed black (including background) using carbon black				P2
		Metal pigments applied on a large scale (taking up > 50% of the projected surface) (lacquering, coating or embossing)				P2
	Nets					P2
	PFAS	PFAS share in food-contact packaging ≥ limit value according to Article 5 (5) PPWR		X		

Examination of design-related valuable material losses	
P0.1	Presence of an aluminium foil layer: examination required (test if necessary) whether the design causes sorting into aluminium fraction. If so, a complete loss of valuable material for packaging category 13 has to be assumed.
P0.2	Presence of ferromagnetic components ≥ 5% by weight in relation to the object of determination: examination required (test if necessary) whether the design causes sorting into ferrous metal fraction. If so, a complete loss of valuable material for packaging category 13 has to be assumed.
P2	Testing required to determine if identifiability, including targeted separability, is given in a sensor-based sorting context. Restrictions must be taken into account as proportionate losses of valuable material.
P5	Only the packaging components containing valuable material that have a verified density of less than 1 g/cm³ (including additives, masterbatches, fillers, or in multilayer structures as well as printing inks) must be counted towards the available valuable material share.
P8	For any deviating determination in the sense that incompatible substances do not negatively affect recyclability in individual cases, individual evidence produced through analytical testing must be provided. Requirements for the implementation and documentation of individual evidence are specified in Annex 3.1.

Scope of application of design parameters categorised as P	
P0.1	The criterion explicitly does not apply to metallised packaging.
P2	Explicitly not applicable to large-format transport packaging and to plastic packaging for which a separate plastic-type-only mono-collection is a requirement for recycling (e.g. EPS, reusable packaging in deposit systems, etc.).
P5	Explicitly not applicable to large-format transport packaging or to reusable packaging that is recycled via a separate mono-collection and whose recycling process does not include density separation.

A 2.14 HDPE and PP – rigid (natural/coloured)

As things currently stand, packaging category no. 14 does not include any packaging subject to system participation. If packaging subject to system participation falls under packaging category no. 14 going forward, its recyclability must be determined based on the main material in accordance with Annex A 2.10 for HDPE and Annex A 2.12 for PP.

A 2.15a PS – rigid (natural/coloured)

a. Scope of application

The following determination principles, criteria and requirements apply to packaging with PS as the main material. Examples include: bottles < 5 litres, cups, trays, blisters, cans, jars.

b. Categorisation of design parameters, including examination and testing requirements

The most common design parameters of rigid plastic packaging made of PS are listed below in a table, assigned to the columns 'valuable material', 'incompatibilities', 'separable or conditionally compatible', and 'examination of design-related valuable material losses'. The last categorisation mentioned may also be additive and refers to the corresponding examination or determination requirement in the lower section of the table at the end of the chapter.

c. Calculation of recyclability

1. If no parameter is assigned to the 'incompatible' category, the recyclability corresponds numerically to the sum of the shares of the materials or formulations that are categorised as 'valuable material'. This scenario represents the standard case.
2. If one or more design parameters are categorised as 'requiring examination', it must be determined whether they result in design-related valuable material losses. If such losses can be ruled out through examination, the parameter has no impact on the calculation in accordance with paragraph 1. Otherwise, design-related losses must be determined and deducted.
3. If one or more design parameters are categorised under 'incompatibilities', recyclability is 0 %.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

While individual evidence for the existence of a recycling infrastructure is not required to establish recyclability, it is recommended.

PS – rigid (natural/coloured) | Reference application: Injection moulding products						
Main body						
			Valuable material	**Incompatibilities**[48]	**Separable or conditionally compatible**	**Examination of design-related valuable material losses**
Main body	**Material**	PS	X			
		HIPS	X			
		GPPS	X			
		SBS	X			
		rPS	X			
	Materials in multilayer, density ≥ 1 g/cm³ or ≤ 1.08 g/cm³	COC layer		X		
		EAA-, EEA-, EMA-, EMAA layer		X		
		EVA layer		X		
		EVOH layer		X		
		PA layer		X		
		HDPE layer		X		
		MDPE layer		X		
		LDPE layer		X		
		LLDPE layer		X		
		rPE layer		X		
		PE-PP blend layer		X		
		PE-X layer		X		
		PE peel layer (non-specific)		X		
		PET layer		X		
		rPET layer		X		
		PP layer		X		
		PP-ethylene copolymer layer		X		
		rPP layer		X		
		PP peel layer (non-specific)		X		
		PVDC layer		X		
		PVOH layer		X		
		Other non-PS polymer layer		X		
	Materials in multilayer, density < 1 g/cm³ or > 1.08 g/cm³	Multilayer structure, density < 1 g/cm³ or > 1.08 g/cm³			X	P5
	Structure	Multilayer structure				P2
	Masterbatch or colour batch	Masterbatch, colour batch	X			
		Dyeing using carbon black (also when used for internal layers)				P2

[48] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[49]	Separable or conditionally compatible	Examination of design-related valuable material losses
Main body	Fillers, mineral additives and absorbers	Absorber (mineral)	X			P5
		Lime, chalk	X			P5
		Talc	X			P5
		Titanium dioxide	X			P5
	Additives	Additives in valuable material	X			
	Coating	Acrylic-based coating		X		
		AlOx			X	
		PVOH coating		X		
		SiOx			X	
		Other coatings		X		P8
	Tie layer, adhesive application	Tie layer		X		
		Adhesive			X	
	Decoration	Direct printing			X	
		Lacquer			X	
Ancillary components						
			Valuable material	Incompatibilities[49]	Separable or conditionally compatible	Examination of design-related valuable material losses
Closure/ functional head	Material	Rigid HDPE, rHDPE from closures and functional elements	X			
		Rigid PP, rPP from closures and functional elements	X			
		PA in applicators, 1 g/cm³ ≤ density ≤ 1.08 g/cm³		X		
		SBS	X			
		Aluminium			X	P0.1
		Stainless steel			X	
		Glass			X	
		Steel			X	P0.2
		Non-PS plastic, foamed or filled, density > 1.08 g/cm³			X	
		Other polymer components, 1 g/cm³ ≤ density ≤ 1.08 g/cm³		X		
Label/ sleeve/ sealing film	Material	Monolayer film made of PS, 1 g/cm³ ≤ density (incl. print and lacquer) ≤ 1.08 g/cm³	X			
		Mono/multilayer film incl. print and lacquer, density < 1 g/cm³ or > 1.08 g/cm³			X	P5

[49] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

			Valuable material	Incompatibilities[50]	Separable or conditionally compatible	Examination of design-related valuable material losses
Label/ sleeve/ sealing film	Material	Mono (not PS)/multilayer film, 1 g/cm³ ≤ density (incl. print and lacquer) ≤ 1.08 g/cm³		X		
		Aluminium (sealing) lid, aluminium membrane*	X			
		Fibre-containing labels if the cellulose share can be removed by means of cold washing			X	
		Fibre-based labels if the cellulose share cannot be removed by means of cold washing.		X		
	Decoration	Printing ink			X	
		Lacquer			X	
	Coverage	Large labels (taking up > 50% of the projected surface) made from non-valuable material				P2
		Full sleeve labels				P2
Label	Adhesive application	Adhesive application			X	
Sealing film	Additives	Additives in valuable material	X			
	Coating	Acrylic-based coating		X		
		AlOx			X	
		Metallisation			X	P2
		PVOH coating		X		
		SiOx			X	
		Other coatings		X		P8
Other design parameters						
Other design parameters	Structure	Different types of plastic used on front and back sides				P2
	Coating	Metallisation (unless on the inside or middle layer)			X	P2
	Decoration	> 50% fully printed black (including background) using carbon black				P2
		Metal pigments applied on a large scale (taking up > 50% of the projected surface) (lacquering, coating or embossing)				P2
	PFAS	PFAS share in food-contact packaging ≥ limit value according to Article 5 (5) PPWR		X		
* Inclusion as a valuable material subject to individual evidence pursuant to Annex 3.3						

[50] The potential influence of residual contents has to be taken into account when determining incompatibilities (cf. 3.3).

Examination of design-related valuable material losses	
P0.1	Presence of an aluminium foil layer: examination required (test if necessary) whether the design causes sorting into aluminium fraction. If so, a complete loss of valuable material for packaging category 15 has to be assumed.
P0.2	Presence of ferromagnetic components ≥ 5% by weight in relation to the object of determination: examination required (test if necessary) whether the design causes sorting into ferrous metal fraction. If so, a complete loss of valuable material for packaging category 15 has to be assumed.
P2	Testing required to determine if identifiability, including targeted separability, is given in a sensor-based sorting context. Restrictions must be taken into account as proportionate losses of valuable material.
P5	Only PS components and shares that have a verified density of more than 1 g/cm³ and less than 1.08 g/cm³ (including additives, masterbatches, fillers, or in multilayer structures as well as printing inks) must be counted towards the available valuable material share. Only valuable material shares made of PO that have a verified density of less than 1 g/cm³ (including additives, masterbatches, fillers, or in multilayer structures as well as printing inks) must be counted towards the available valuable material share.
P8	For any deviating determination in the sense that incompatible substances do not negatively affect recyclability in individual cases, individual evidence produced through analytical testing must be provided. Requirements for the implementation and documentation of individual evidence are specified in Annex 3.1.
Scope of application of design parameters categorised as P	
P0.1	The criterion explicitly does not apply to metallised packaging.
P2	Explicitly not applicable to large-format transport packaging and to plastic packaging for which a separate plastic-type-only mono-collection is a requirement for recycling (e.g. EPS, reusable packaging in deposit systems, etc.).
P5	Explicitly not applicable to large-format transport packaging or to reusable packaging that is recycled via a separate mono-collection and whose recycling process does not include density separation.

A 2.15b XPS – rigid (natural/coloured)

a. Scope of application

The following determination principles, criteria and requirements apply to packaging made of foamed polystyrene (XPS). Examples include trays.

b. Categorisation of design parameters, including examination and testing requirements

Packaging subject to system participation made of XPS can only be recycled in Germany if it is collected as mono-material through bring systems at recycling centres. Packaging that accumulates separately with final consumers in this form must therefore be classified as 100% valuable material.

c. Calculation of recyclability

Recyclability is 0 % unless individual evidence is provided.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

Individual evidence in accordance with Section 4 and Annex 3.3 is required to establish recyclability. A requirement whose fulfilment must currently be evidenced is that the volumes in question were collected in a mono-collection outside the usual kerbside collection for lightweight packaging. This is possible, for example, through bring systems at recycling centres, provided that the collection is sorted as mono-material.

A 2.16 EPS – rigid (natural/coloured)

a. Scope of application

The following determination principles, criteria and requirements apply to packaging made of expanded polystyrene (EPS). Examples include: cool boxes, edge protectors and other impact protection for electronic items.

b. Categorisation of design parameters, including examination and testing requirements

Packaging subject to system participation made of EPS can only be recycled in Germany if it is collected as mono-material (white and coarse-grained) through bring systems at recycling centres. Packaging that accumulates separately with final consumers in this form must therefore be classified as 100% valuable material.

c. Calculation of recyclability

Recyclability is 0 % unless individual evidence is provided.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

Individual evidence in accordance with Section 4 and Annex 3.3 is required to establish recyclability. A requirement whose fulfilment must currently be evidenced is that the volumes in question were collected in a mono-collection outside the usual kerbside collection for lightweight packaging. This is possible, for example, through bring systems at recycling centres, provided that the collection is sorted as mono-material (white and coarse-grained) (fraction number 340).

A 2.17 Other rigid plastics (e.g. PVC, PC) including multi-materials – rigid

a. Scope of application

The following determination principles, criteria and requirements apply to rigid plastic packaging such as barrels and bulk containers (unless they belong to packaging categories 7, 8, 10, 12, 14, 15, 16 or 19).

b. Categorisation of design parameters, including examination and testing requirements

No recycling paths exist for rigid sales packaging subject to system participation, such as barrels or bulk containers (unless they are assigned to packaging categories 7, 8, 10, 12, 14, 15, 16 or 19). Consequently, design-for-recyclability requirements that could serve as determination principles cannot be derived.

c. Calculation of recyclability

Recyclability is 0 % unless individual evidence is provided.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

For rigid sales packaging such as barrels and bulk containers (unless they belong to packaging categories 7, 8, 10, 12, 14, 15, 16 or 19), individual evidence in accordance with Section 4 and Annex 3.3 is required to establish recyclability. Based on the verified recycling path, the design-for-recyclability criteria must be derived and applied to the object of determination.

A 2.18 Other flexible plastics including multi-materials – flexible

a. Scope of application

The following determination principles, criteria and requirements apply to flexible plastic packaging such as bags, blisters, thermoformed packaging, vacuum packaging, big bags and stretch films (unless they belong to packaging categories 9, 11, 13 or 19).

b. Categorisation of design parameters, including examination and testing requirements

No recycling paths exist for flexible plastic packaging subject to system participation, such as bags, blisters, thermoformed packaging, vacuum packaging, big bags or stretch films (unless they are assigned to packaging categories 9, 11, 13 or 19). Consequently, design-for-recyclability requirements that could serve as determination principles cannot be derived.

c. Calculation of recyclability

Recyclability is 0 % unless individual evidence is provided.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

For flexible plastic packaging such as bags, blisters, thermoformed packaging, vacuum packaging, big bags and stretch films (unless they belong to packaging categories 9, 11, 13 or 19), individual evidence in accordance with Section 4 and Annex 3.3 is required to establish recyclability. Based on the verified recycling path, the design-for-recyclability criteria must be derived and applied to the object of determination.

A 2.19 Biodegradable plastics – rigid (e.g. PLA, PHB) and flexible (e.g. PLA)

a. Scope of application

The following determination principles, criteria and requirements apply to packaging, rigid and flexible, made of biodegradable plastics such as PLA and PHB.

b. Categorisation of design parameters, including examination and testing requirements

No recycling paths exist for sales packaging subject to system participation that is made of biodegradable plastics. Consequently, design-for-recyclability requirements that could serve as determination principles cannot be derived.

c. Calculation of recyclability

Recyclability is 0 % unless individual evidence is provided.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

Individual evidence in accordance with Section 4 and Annex 3.3 is required to establish recyclability. Based on the verified recycling path, the design-for-recyclability criteria must be derived and applied to the object of determination.

A 2.20 Wooden packaging, including cork

a. Scope of application

The following determination principles, criteria and requirements apply to wooden packaging, including cork, such as pallets, crates and boxes.

b. Categorisation of design parameters, including examination and testing requirements

No recycling paths exist for sales packaging subject to system participation that is made of wood, including cork. Consequently, design-for-recyclability requirements that could serve as determination principles cannot be derived.

c. Calculation of recyclability

Recyclability is 0 % unless individual evidence is provided.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

Individual evidence in accordance with Section 4 and Annex 3.3 is required to establish recyclability. Based on the verified recycling path, the design-for-recyclability criteria must be derived and applied to the object of determination.

A 2.21 Natural and synthetic textile fibres

a. Scope of application

The following determination principles, criteria and requirements apply to packaging made of natural/synthetic textile fibres, such as bags, pouches and cords.

b. Categorisation of design parameters, including examination and testing requirements

No recycling paths exist for textile sales packaging subject to system participation. Consequently, design-for-recyclability requirements that could serve as determination principles cannot be derived.

c. Calculation of recyclability

Recyclability is 0 % unless individual evidence is provided.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

For textile sales packaging, individual evidence in accordance with Section 4 and Annex 3.3 is required to establish recyclability in accordance with the minimum standard. Based on the verified recycling path, the design-for-recyclability criteria must be derived and applied to the object of determination.

A 2.22 Clay, stone, ceramics, porcelain

a. Scope of application

The following determination principles, criteria and requirements apply to packaging made of clay, stone, ceramics and porcelain, such as pots, containers, bottles and jugs.

b. Categorisation of design parameters, including examination and testing requirements

No recycling paths exist for sales packaging subject to system participation that is made of stoneware or porcelain. Consequently, design-for-recyclability requirements that could serve as determination principles cannot be derived.

c. Calculation of recyclability

Recyclability is 0 % unless individual evidence is provided.

d. Requirement of individual evidence for the 'existence of recycling infrastructure' criterion

Individual evidence in accordance with Section 4 and Annex 3.3 is required to establish recyclability. Based on the verified recycling path, the design-for-recyclability criteria must be derived and applied to the object of determination.

Annex 3: Analyses and individual evidence

Annex 3.1: Requirements for compatibility analyses

1. Examining and determining the compatibility of packaging variations in deviation from the categorisation in Annex 2 requires analyses, measurements or calculations. These analyses, measurements or calculations must be conducted using reliable, exact and reproducible state-of-the-art methods whose results are subject to little uncertainty.
2. In the case of empirical analyses in laboratories, pilot plants or operations, the analysis methods, sample preparation and all relevant machine settings must be documented and aligned with the requirements set out in the first paragraph.
3. When planning and conducting analyses, it must be ensured (and explained in detail in the analysis report) that the chosen analysis and determination method, i.e. the determination parameters and criteria, is suitable for justifying that a packaging variation has been categorised differently from the specification in Annex 2 based on the reference application(s) defined there.
4. If the analysis results are used to trigger general exemptions from the categorisation in Annex 2 for certain substances, materials or recipes, the analysis reports must be published in a suitable manner and in compliance with the requirements specified in the first to third paragraphs; the timing of the publication must enable participation in the minimum standard consultation.

Annex 3.2: Requirements for evidencing sortability and separability

1. When evidence is mandatory, examining and determining the sortability and separability of a packaging variation's valuable material share requires measurements and calculations. These measurements and calculations must be conducted using reliable, exact and reproducible state-of-the-art methods whose results are subject to little uncertainty.
2. In the case of empirical analyses in laboratories, pilot plants or operations, the analysis methods, sample preparation and all relevant machinery and settings parameters must be documented and aligned with the requirements set out in the first paragraph. It is expressly noted that if measurements are conducted in operational plants with individual machinery or units being recognised, the functional integration of this individual machinery or these units into the overall process must also be documented (e.g. roughing stage for particles in the range of 20–140mm, cleaning stage, etc.) and the explicit indication of the maintenance state as per the producer's maintenance requirements is mandatory (e.g. most recent calibration).
3. When planning and conducting analyses, it must be ensured (and explained in detail in the analysis report) that the chosen analysis and determination method, i.e. the determination parameters and criteria, is suitable for transferring the results to the practice of sorting and recovery. This particularly refers to the question whether state-of-the-art technology was used.
4. Sortability and separability are not binary, but rather an analogously developed packaging characteristic. Design-related packaging losses (and therefore direct proportional losses of valuable material) in the sorting and separation processes must be quantified. The analysis methods must take into account, for example, that the individual operations for sorting out non-metallic sorting fractions are carried out in several stages and that cleaning stages (RCS processes) can partially compensate for incorrect ejections. Stochastic and systematic measurement errors must also be taken into account so that only design-related losses are quantified.
5. If the analysis results are used to trigger general exemptions from the individual evidence obligation for certain packaging variations, packaging components or packaging material variations, the analysis reports must be published in a suitable manner and in compliance with the requirements specified in the first to third paragraphs; the reports must be published prior to the start of the minimum standard consultation.

Annex 3.3: Requirements for evidencing the existence of recycling infrastructure

Individual evidence for the existence of recycling infrastructure is recommended for packaging categories with an application rate below 80%, according to an analysis of the German Environment Agency[51]. Within the scope of the minimum standard, this evidence is mandatory if the application rate for the packaging category falls below 20%. Packaging categories for which individual evidence is recommended or mandatory, as well as the fraction numbers of the sorting fractions through which such evidence can be provided, are listed in the following table.

Packaging category, as defined in table 1 of Annex II PPWR:		Application rate (in %)	Individual evidence recommended	Individual evidence mandatory	Individual evidence by fraction numbers
No	Packaging type				
3	Liquid packaging board[52]	PolyAl 24.1 – 38.8	x		323-512 323-503
3	Composite packaging of which the majority is paper/cardboard	42.7 – 46.9	x		550
8	Thermoforms made of PET-A and PET-C – rigid (transparent, clear/coloured, opaque)	11.2 – 58.3		x	328-5 328-6
8	Other packaging made of PET-A and PET-C – rigid (transparent, clear/coloured, opaque)	11.2 – 58.3		x	328-5 (328-1) (328-2) (328-3)
9	PET – flexible (natural/coloured)	0		x	–
11	PE – flexible (natural/coloured)	50.8	x		310 (323) 323-2
13	Flexible packaging made from PP	33.0	x		324-2 (310) (323) (323-2) (324-1)

[51] https://www.umweltbundesamt.de/publikationen/praxis-der-sortierung-verwertung-von-verpackungen-2 (publication in preparation).

[52] Individual evidence is recommended for the PO and Al share (polyolefins from PE/PP film and PE/PP caps and closures as well as aluminium foil), as the existence of the recycling infrastructure for polyAl (by-product from the processing of paper grades 5.03.00 as per EN 643 or fraction number 512 consisting of polyolefin-based plastics, plastic-aluminium composites and aluminium, largely fibre-free (< 5% DM) according to technical standards) has been limited to date.

Packaging category, as defined in table 1 of Annex II PPWR:		Application rate (in %)	Individual evidence recommended	Individual evidence mandatory	Individual evidence by fraction numbers
No	Packaging type				
15	Rigid packaging made from PS	64.4	x		331 (351)
15	Rigid packaging made from XPS	0		x	–
16	Rigid packaging made from EPS	0		x	340
17	Other rigid plastic packaging (e.g. PVC, PC), including multi-materials	0		x	–
18	Other flexible plastic packaging, including multi-materials	0		x	–
19	Biodegradable flexible and rigid plastic packaging [1] (e.g. PLA, PHB)	0		x	–
20	Wood, cork	0		x	–
21	Textiles (natural and synthetic textile fibres)	0		x	–
22	Ceramics or porcelain stoneware (clay, stone)	0		x	–

Requirements for documenting individual evidence under Section 4, applicable to dual systems

Individual evidence must be produced for each party under participation obligation, packaging type and reference year. The systems (PROs) should provide the ZSVR with evidence for a given reference year in an aggregated form, i.e. with a report pursuant to section 21 (2) VerpackG. They are required to document recovery volumes and participation volumes, the latter categorised as recyclable by individual evidence.

1. Evidence of recovery volumes for the reference year includes:
   (1) Supply volumes received by the system (PRO) as per the list of weighting notes, broken down by fraction number, showing sender and final recipient facility
   (2) Evidence of high-quality mechanical recycling under Section 4 (2) for final recipient facilities
   (3) Eligible shares of the packaging type to be documented as per product specification, broken down by fraction number (based on a Germany-wide analysis, if required)
   (4) Recovery rate recommended for the final recipient facilities, as per certificate and broken down by fraction number (for the packaging type to be documented)
   (5) Subtotals and totals for the volumes of the packaging type that is to be documented and was transferred for high-quality mechanical recycling. Proof used as individual evidence of recovery volumes must be attested by the expert instructed to audit the volume flow report.
2. Evidence of participation volumes for the reference year includes:
   (1) Participation volumes, broken down by packaging type to be documented and party under obligation, including a conclusive indication of individual packaging (EAN, GTIN or internal product code)
   (2) Information about the recyclability of the packaging included in the individual evidence (recyclability as defined under Section 3.2 et seqq. in this minimum standard)
   (3) Total participation volumes covered by the individual evidence, broken down by packaging type
   (4) Note: The sums of specific recovery volumes by packaging type under 1 (5) must be equal to or exceed the corresponding volumes under 2 (3).

The following examples serve to clarify the procedure:

Example 1:

A producer of frozen products distributes these goods in large polystyrene (EPS) boxes. It has been determined that the packaging complies with the process-specific criteria under Sections 3.2 and 3.3 of this minimum standard. To fulfil their producer responsibility, the party subject to system participation has agreed that the system (PRO) will ensure that during the reference year at least the equivalent of the specific EPS participation volume be transferred for high-quality recovery. The system has categorised the packaging as recyclable.

Evidence must be produced as follows:

- certificate issued for the EPS recycling plant(s) as the final recipient pursuant to the Verpackungsgesetz, certifying high-quality, mechanical EPS recycling;
- verifiable documentation demonstrating that packaging subject to system participation in a volume in line with the specific participation volume has been collected, as well as verifiable documentation of the corresponding volumes delivered to the certified EPS recycling plant(s).

Example 2:

A producer packages goods in transparent PET-A monolayer trays. All packaging characteristics comply with the process-specific criteria under Sections 3.2 and 3.3, for example labels made from PP have been applied with wash-off adhesives. The participation volume is 600 tonnes p.a. The system has categorised the packaging as recyclable. The system has committed to transferring a corresponding volume of PET trays for high-quality mechanical recycling in the reference year. To this end, the system has entered into an agreement with a PET recycling plant that produces PET pellets from these trays and has been certified for the 328-2 fraction with a mechanical recovery rate of 100%.

Evidence must be produced for:

- in the case of the 328-2 fraction, a delivery volume of at least 2,000 tonnes (equivalent to a maximum of 600 tonnes of trays)
- actual existence of the equivalent in trays
- transfer for high-quality mechanical recycling (facility certificate)