Netherlands Institute
for Sustainable Packaging
part of **verpact**

Background document

Recycle Check Glass Packaging 2026



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Background document Recycle Check for glass packaging 2026
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The Recycle Checks are updated annually. Check the website of the Netherlands Institute for Sustainable Packaging (KIDV) for the latest version.

For questions about a Recycle Check, please contact the KIDV.

The KIDV would like to thank the trade organisations, material and packaging manufacturers, manufacturers and importers of packaged products and sorters and recyclers for contributing to this Recycle Check. The KIDV has created this document with the utmost care and attention. Should the document nevertheless be incomplete or contain any inaccuracies, please let us know.

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Netherlands Institute
for Sustainable Packaging
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Part I:
Basic information

1. Introduction

The Recycle Checks (published since 2019) enable companies to relatively easily and quickly assess whether packaging is easily recyclable. In recent years, Recycle Checks have been published for rigid plastic packaging, flexible plastic packaging and packaging made of paper and cardboard, glass, metal, and beverage cartons.

The Recycle Checks are based on the current system of collecting, sorting and recycling packaging materials in the Netherlands. The processes examined are those used to process the largest tonnages of household waste stream: what happens to packaging after a consumer disposes of it at home and how is this (household) waste processed in the sorting and recycling plants? Local initiatives, market developments or innovations may affect the recyclability of packaging. The KIDV monitors these developments and changes in the market as closely as possible. The Recycle Checks are updated in close conference with the relevant chain parties if and when new developments apply to the majority of the packaging released on the Dutch market.

The Recycle Checks apply to packaging that is discarded as waste by households, offices, shops and the catering industry. The Recycle Checks are also used for packaging collected through the system for returnable packaging for which consumers have paid a deposit.

In the Netherlands, municipalities themselves determine how residents should dispose of their waste. Glass and paper/cardboard are separated at source. So-called PMD packaging (plastic, metal, beverage cartons) can be collected using source or post-collection separation.
With separation at the source, residents are asked to perform the initial sorting step themselves by discarding PMD separately in a bin or bag. Everything else is residual waste. Post-collection separation means that residents dispose of all their waste in the same bin or bag. After being collected by the municipal waste collection service, a specialist organisation further sorts the waste to separate material with recycling potential. Milieu Centraal's Waste Separation Tool is a handy tool to check in what bin each type of waste must be deposited.

1.1 The Recycle Check.

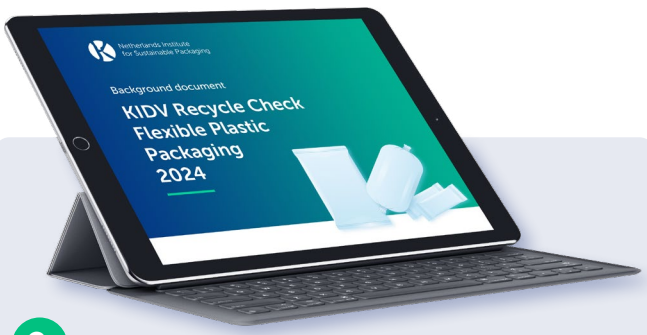
The Recycle Check consists of two parts:



1

The online Recycle Check checklist serves to assess the recyclability of the packaging (optimal, reasonable, limited or non-recyclable).
The contents of the Recycle Check were updated in September 2025.

Optimal | Reasonable | Limited | Non-recyclable



2

The **background document**, consisting of two parts:

Part I: basic information about how to use the Recycle Check, definitions and concepts and information on determining disposable units. This part is the same for all documents.

Part II: material-specific information about collection, sorting, and recycling processes, as well as instructions on how to assess certain properties of packaging components. The background document can also be used as a source of reference with guidelines to improve the recyclability of packaging. The documents are available for the following materials:

- Flexible plastic
- Rigid plastic
- Paper / cardboard
- Glass
- Metal
- Beverage cartons

Part II starts on page 24.

The KIDV website also features **tools** to help you do the Recycle Check, such as Guidance on the Use of Recyclate, and guidance around determining colour. Also take a look at the **Packaging Glossary** for a list of the most frequently used terms and their definitions. These documents may be updated throughout the year.

1.2 Legislation.

The Recycle Check and accompanying documents take into account, wherever applicable, the European and national legislation in force at the time of publication. On 22 January 2025, the new packaging regulation, the Packaging and Packaging Waste Regulation (PPWR), was published. The specifics of this still need to be elaborated further, and it is expected that they will be announced in 2027. If the PPWR gives reason to do so, the Recycle Check will be adjusted. Further information about the PPWR is available on the **Verpact website**. This information will be updated throughout the year.

Essential Requirements

When placing packaging on the Dutch market, it must, at the time of writing, comply with the so-called **Essential Requirements** from the Packaging Management Decree ('Besluit Beheer Verpakkingen'). Please monitor the website for updates on this legislation.

The essential requirements stipulate that the environmental impact of packaging must be minimal. This is recorded in a product file, which must also include an explanation of how material can be recovered. The **KIDV Recycle Check** answers several of the questions from the associated standard. Use the results of the Recycle Check, as well as related specifications and other explanatory information, and add them to the product file.

The PPWR will also ask for such information, so it would be smart to start working on it ahead of time, so as to comply with current legislation and be well prepared for future legislation.

1.3 Food safety.

Food packaging may contain various chemical substances. When such packaging comes into contact with a product, substances from the packaging can migrate into the food. This may pose risks to human health. Some substances are prohibited (e.g. almost all PFAS), while other substances can be used under certain conditions (e.g. BPA). The KIDV offers various tools to support producers and importers of packaging and packaged products in assessing their packaging materials in this area. Please see the **food safety dossier** for more information.

1.4 Exceptions.

A number of product-packaging combinations may not be collected with household packaging waste because they can seriously disrupt the process, or cause unsafe situations. In this case, consumers can dispose of the packaging by an alternative route. The Recycle Check will then not apply.
There are two reasons why packaging should be collected separately:

- Packaging material creates problems in the process
- The product that was packaged in the packaging creates problems in the process

Packaging materials that cause problems

Most material streams contain packaging materials that may disrupt the sorting and recycling process, including the following:

- **EPS (polystyrene)** is difficult to process during the sorting and recycling stages, as the small static plastic spheres cause a lot of nuisance. Small EPS packaging such as cups and trays must be placed in the residual waste. Larger EPS crates and buffer material should be taken to a municipal recycling facility. The material can then be processed further by a recycler.
- **Wooden packaging:** there is no separate collection system for wooden packaging materials, such as wine boxes. Small wooden packaging can be disposed of with residual waste, and larger pieces should be taken to a municipal recycling facility.
- **Plastic (fruit) nets** often get stuck in the systems during the sorting of plastics. This causes them to disrupt and contaminate sorting systems. These nets must, therefore, be placed in the residual waste.
- **Ceramic, stone, and porcelain** are often deposited in bottle banks by consumers, which is not where they belong. These materials are not glass and are not collected as a separate stream in the Netherlands, but they go with the residual waste.
- **Bio-degradable** disposable units containing compostable plastics can have a major impact on recyclability, even if they end up in the mixed stream. The **Yes/No** lists for the separation of plastic, metal and beverage cartons at source state that compostable plastic packaging must not be disposed of with plastic, metal, and beverage carton waste. For more information, read the KIDV fact sheets on **bio-based** and **bio-degradable** packaging.

Product inside the packaging that causes problems

Small chemical waste consists of a list of hazardous substances that are released in small quantities from households, such as certain cleaning products, alcohol and medicines. Properly emptied packaging for medicines and small chemical waste may be disposed of with household packaging waste, but if the packaging is not completely empty, it and its contents must be disposed of separately via the recycling facility or pharmacy. This does not apply to empty buckets or packaging that once contained silicone, paint, latex, and cement; these should be disposed of with residual waste.

Clearly indicate on the packaging where the product may or may not be disposed of, so consumers do not dispose of the residual product via residual waste or flush it down the drain.

Example

An empty glass jar of skin cream or perfume bottle is not considered to be small chemical waste and may be disposed of in the bottle bank, while a jar that contains or contained a remnant of medication (e.g. antibiotics) does constitute small chemical waste and must be taken to a recycling facility or pharmacy.



Figure 1. Glass bottle containing medication

Milieu Centraal's Waste Separation Tool helps consumers figure out what bin to deposit the different kinds of packaging into. On www.recycleklaar.nl, you can check whether or not your packaging can be disposed of in the plastic, metal, and beverage carton (PMD) waste stream.

2. Recyclability and fee modulation

2.1 Definition of recyclability

The recyclability of packaging is partly determined by whether and to what extent it can be collected, sorted, recycled and reused. In addition, there are recycling targets for the various materials. While these are two different things, they are still related.

- **Recyclability** concerns the extent to which packaging or a disposable unit can be processed by the current system of collecting, sorting, and recycling, and how the raw material can be reused. Packaging can be non-recyclable, limited recyclable, reasonable recyclable or optimal recyclable.
  It is an assessment of the disposable unit that looks at how likely it is that the packaging will have an optimal passage through the recycling process, looking at the specific design of that disposable unit. As a basis for that assessment, the KIDV uses the definition given in the box below.
- **The recycling target** is a legal target that concerns the amount of material that must be collected, sorted and recycled after it has been placed on the market. For most materials, a larger percentage of packaging – of what has been placed on the market in the Netherlands – must be recycled each year.

Packaging must meet four basic criteria to be deemed to be recyclable:

1. The disposable unit must be made in such a way that it can be collected or picked up by approved waste collectors.
2. The disposable unit must be sorted and/or bundled into pre-defined streams for recycling processes.
3. During the recycling process, the material* is processed on an industrial scale** and is reclaimed into a raw material.
4. Recovered raw material has a uniform composition*** and is used to produce new packaging or products.

The extent to which these four basic criteria are met can be assessed using the Recycle Checks. A Recycle Check assesses whether the disposable unit is optimal, reasonable, limited or non-recyclable (see paragraph 2.2).

* *Depending on the material of the main component in the disposable unit, the amount of target material that can be recovered has to be above a certain minimum for the recycling process to make packaging highly recyclable, which is determined for each Recycle Check.*

** *Industrial scale means that more than half of the disposable units entering the market end up at recyclers and there is sufficient recycling capacity to recycle the sorted material within Europe.*

*** *Uniform composition means that the recyclate offers predictable and consistent quality as a new raw material and is used in a new product or packaging.*

The aim of the Recycle Checks is to help companies make their packaging (more) circular. The vision set out by the Ellen MacArthur Foundation serves as the basis for this endeavour:

> *'A circular economy is one that is restorative and regenerative by design and aims to keep products, components and materials at their highest utility and value at all times'*
>
> MacArthur, 2015

This commitment to circularity underpins the definition of recyclability developed by the KIDV, as mentioned above.

2.2 Categories of recyclability

In the checklist, we distinguish between optimal recyclable, reasonable and limited recyclable, or even non-recyclable packaging. The lowest score has the greatest weighting in determining the overall score. The coloured borders designate the following categories:

Non-recyclable
This qualification is used for packaging that contains a disruptor, i.e. materials that severely disrupt the recycling process and lead to the material stream being rejected.

Limited recyclable
Packaging that cannot be easily recycled because it, for example, ends up in the mixed stream (a mixture of various kinds of materials) after sorting. The material remaining after recycling has limited applications, because it contains components that (severely) disrupt recycling and are difficult to remove.

Reasonable recyclable
Packaging that requires an additional processing step before it can be classified as 'highly recyclable'. While this type of packaging does end up with the recycler as a homogeneous stream, there is something in its composition that somewhat affects the quality of the recyclate or the effectiveness of the process*.

Optimal recyclable
All properties of this type of packaging are optimally suited for recycling, making it 'highly recyclable' according to the aforementioned definition from the Recycle Check.

2.3 Fee modulation (for plastic packaging)

Are you required to pay a waste management contribution to Verpact? If you are, make sure you check whether your packaging qualifies for a **modulated fee**.

In 2024, Verpact introduced Fee Modulation 2.0, which incentivises highly recyclable **plastic packaging** and the use of recyclate. This applies to all packaging containing more than 50% plastic by weight that does not qualify for other fee reductions. A distinction is made between rigid packaging and flexible packaging, each of which has its own starting fee.

Plastic Fee Modulation 2.0 differs from its predecessor (in force since 1 January 2019) in that it also rewards minor improvements. There are four conditions that each entitle parties to a discount of 10 cents on the starting fee, and since 2025, a 20-cent discount for the use of post-consumer recyclate. One of the conditions is that packaging must have a 'highly recyclable' rating in the Recycle Check.

Innovative materials
Producers of innovative materials must be able to demonstrate that these materials can be collected and sorted in sufficient quantities and that they are compatible with existing industrial recycling processes or that new processes are available on an industrial scale. To coordinate innovative materials with fee modulation, the innovation trajectory for the plastic chain is in place. Verpact stimulates innovation in plastic packaging through a special programme within the Plastic Fee Modulation Regulation, which provides scope for new materials or production processes/techniques. The aim of this programme is to improve the recyclability, circularity and sustainability of plastic packaging and thus contribute to the objectives of Verpact's Plastics Guide. Please see **Verpact's website** for more information.

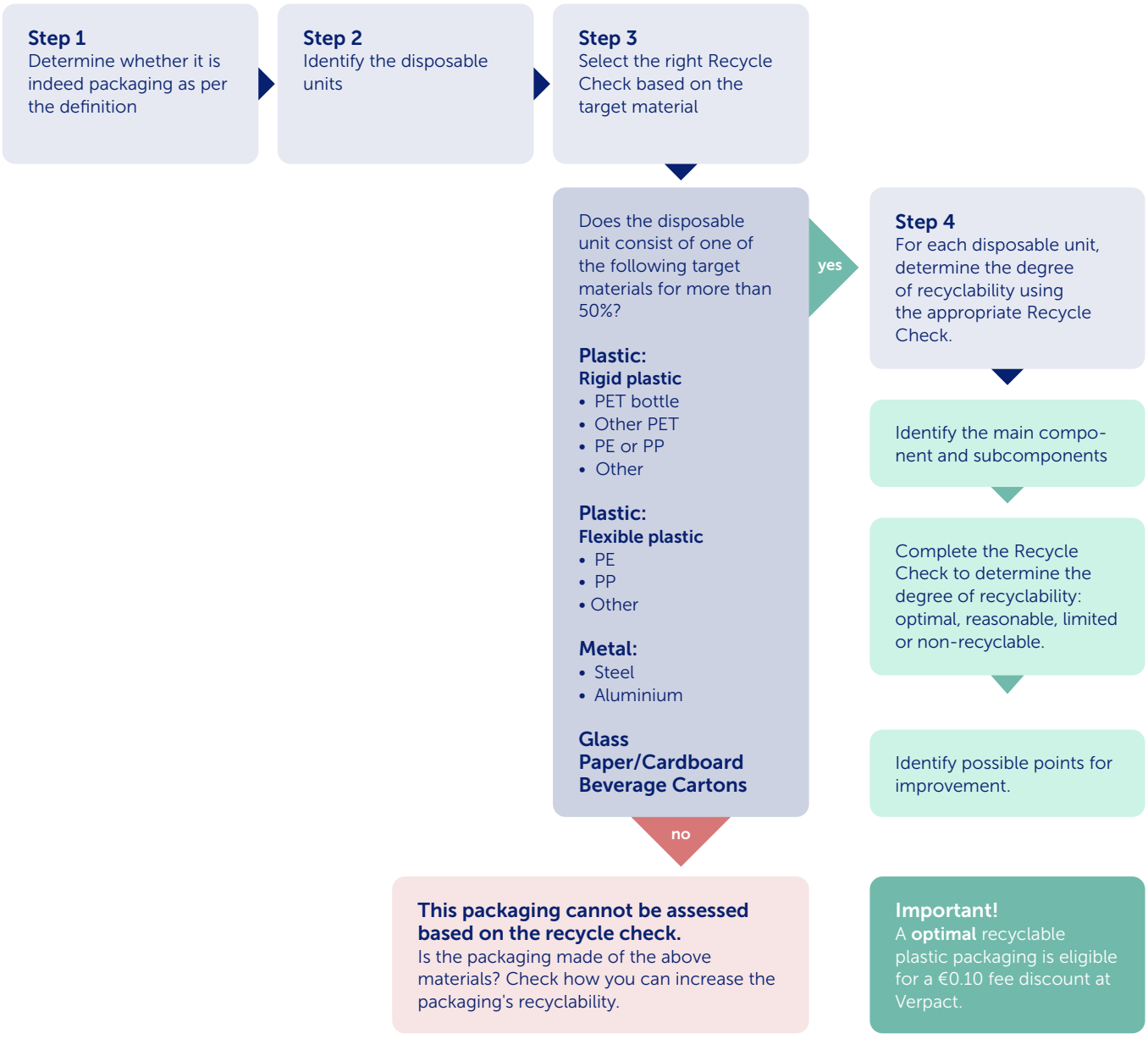
* The ideal composition of this stream varies per material and is explained for each material separately.

3. Select the right Recycle Check

The Recycle Checks were developed specifically to assess the recyclability of packaging. Packaging often consists of several different components, which may or may not be made of different materials, which users discard at different times. This affects the packaging's overall recyclability. The Recycle Checks first split packaging up into its constituent disposable units and then into a main component and subcomponents. To determine which Recycle Check(s) should be completed, it is important to first determine which disposable units the packaging consists of, and then to categorise these units by material. This section explains these terms and details the steps for choosing the right Recycle Check.

A preview of these steps is provided in the figure below, and they are further explained in the paragraphs below:

Figure 2. Select the right Recycle Check



Step 1. Determine whether it is indeed packaging

Recycle Checks can only return a reliable outcome for **packaging**. Therefore, it must first be verified that the object to be assessed meets the definition of packaging. The KIDV uses the following definition for that:

Packaging:
All products, made of materials of any kind, that can be used to contain, protect, ship, deliver and offer other products, ranging from raw materials to finished products, along the entire pathway from producer to user or consumer, including disposable items used for this purpose.

For the full definition of 'packaging', see Verpact's **policy document**. If in doubt about whether something does indeed constitute packaging, consult the (non-exhaustive) **Packaging Catalogue** on Verpact's website.

Step 2. Identify the disposable units

Most packaging is discarded in its entirety after use and is therefore considered a **single disposable unit**. Packaging that is not discarded in its entirety but as several separate components consists of **multiple disposable units**.

Whether different components or materials go through the sorting and recycling process together or separately can have a significant impact on recyclability. In practice, a single piece of packaging can consist of highly recyclable, moderately recyclable and poorly recyclable disposable units at the same time.

The KIDV goes by the principle that each packaging consists of a single disposable unit, unless:
- it consists of several unconnected components.
- part of the packaging must be permanently and completely removed in order to use the product.
- it features components, such as a lid, that can be detached by applying slight mechanical force

For some packaging, it is not always immediately clear whether it concerns one or more disposable units. A test is then required to determine how many units the packaging consists of. Some examples are elaborated below.

Packaging consisting of a single disposable unit

Table 1. **Single disposable unit**

Packaging that consists of a single piece of one material.	 Single disposable unit	***Example 1:*** *A cardboard box that is clean and dry can be disposed of with waste paper.*

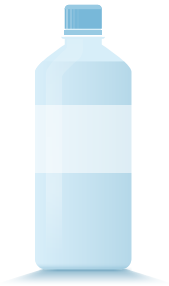
Packaging with fixed closure.



Single disposable unit

Example 2:
Glass packaging with a bracket closure are considered a single disposable unit because the bracket permanently connects the main component and lid. Even plastic bottles and beverage cartons currently often come with a permanently attached cap.

Packaging with bonded labels.



Single disposable unit

Example 3:
Labels glued to the packaging are considered subcomponents, and are not a separate disposable unit. Caps are not a separate disposable unit either, as they are generally screwed back on, and are, moreover, often attached to the bottle these days.

Packaging with multiple disposable units

There are several categories of packaging that consist of multiple disposable units. To clarify this, some examples are detailed below. Step 3 will further explain how to then choose the appropriate Recycle Check for each disposable unit.

Table 2. Multiple disposable units

Packaging consisting of several unconnected components.

The components are disposed of at different times.



Thirteen disposable units

Example 1:
A cardboard carrier tray that holds 6 small bottles. The cardboard tray and bottles each belong in a different waste stream. The crown caps on the bottles also constitute separate disposable units. So, what we have here are 13 disposable units made of 3 different materials.



Five disposable units

Example 2:
Cardboard box containing four bars, each wrapped individually in plastic wrappers. Users will take a bar from the box at different times/in different places. Therefore, the wrappers and the box are discarded at different times and places, and should be assessed separately with a Recycle Check.

Packaging with a component that must be permanently and completely removed in order to use the product

It should be possible to remove this part completely without tools (such as scissors) and without leaving any material residue.



Multiple disposable units

Example 3:
A cardboard sleeve around a plastic container. The sleeve has to be removed to open the container and access the product.



Multiple disposable units

Example 4:
A (champagne) bottle with a cork and a muselet (a wire cage that goes over the cork). These are three disposable units (bottle, cork and muselet) that go in different waste streams.

Further evaluation

There is also packaging that consists of multiple parts, which sometimes form separate disposable units and sometimes not. Further evaluation is needed to determine which disposal units the packaging consists of. A couple of examples are elaborated below.

Packaging with a component that does not necessarily have to be removed at all or not completely to be able to use the product.



Single disposable unit

Example 1:
Plastic flask with a paper sleeve that is, for example, held in place by the tapered design of the flask. The sleeve is not glued to the flask and does not need to be removed to be able to use the product. Packaging and sleeve make up a single disposable unit together, whereby the sleeve must be considered to be a label.

Short self-assessment

Sleeve detachment test

Some units of packaging feature a sleeve that is supposed to come off entirely when the packaging is compressed. This includes plastic cups with a perforated cardboard sleeve that is designed to detach when the cup is compressed. There is a protocol to test whether cup and sleeve indeed detach from each other and behave like individual disposable units. Called the Pollution and Compression Protocol, this protocol is available on the **protocols page** of the KIDV website.

Cardboard sleeve
If plastic packaging comes with a cardboard sleeve around it that consumers do not undo, but which has been shown to come loose during collection and sorting, the sleeve and packaging behave as individual disposable units. It must then be taken into account that in this case the cardboard sleeve will end up in the wrong sorting stream and must be considered non-recyclable.

The packaging features components, such as a lid, that can be detached by applying slight mechanical force.

There are types of packaging that have components, such as lids, that come off during the collection and sorting process, causing them to be processed as individual units during the sorting step.



Multiple disposable units

Example 1:
Margarine tub with a rigid lid. The lid comes off easily when subjected to minor mechanical force, meaning that it is an individual disposable unit in the packaging sorting process, even if the tub and the lid were originally discarded together.



Multiple disposable units

Example 2:
Cardboard tube with plastic cap. This lid comes off easily after being subject to minor mechanical force, becoming an individual disposable unit in the sorting process, even if the tube and the cap were originally placed in a bag or bin together as one whole.

Short self-assessment

Simple lid detachment test

You can test whether a lid detaches when slight mechanical force is applied by squeezing the empty packaging with the lid on. If the lid pops off completely, it is deemed an individual disposable unit.

Packaging with components such as a release liner



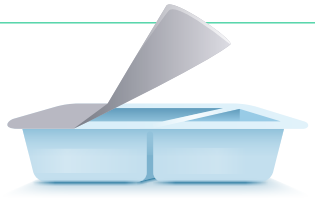
Multiple disposable units

Example 1:
Pouches/containers with ingredients in a ready-to-eat salad. These various individual components are separate disposable units and are discarded individually after use.



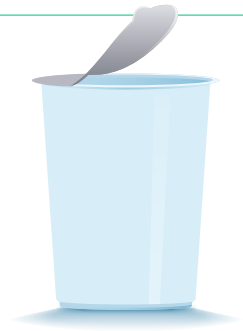
Multiple disposable units

Example 2:
A tamper-evident seal on the neck of a jar or bottle with a diameter of up to 40mm. The product cannot be used properly if the seal is not completely removed first. Used means that the product cannot be poured, spooned or dispensed, depending on the intended use of the container. Cap and bottle together make up one disposable unit, while the seal is a separate disposable unit.



Multiple disposable units

Example 3:
Plastic tray with release liner that must be completely removed to be able to use the tray's dispensing functionality.



Single disposable unit

Example 4:
Cups, trays with a wide neck, and trays where the release liner does not have to be detached completely to be able to use the product are also considered single disposable units. The liner can even be used to reseal the packaging.

Short self-assessment

Simple detachment test - release liner

You can test whether a release liner detaches when slight mechanical force is applied by grabbing the open, empty packaging by the release liner and shaking it. If the foil comes off easily, it is deemed an individual disposable unit. At the start of the test, at least 25% of the release liner must still be attached to the rest of the packaging.

If there is doubt as to whether packaging consists of one or multiple disposable units, and the above examples do not provide clarity, please contact us using the **KIDV Q&A**.

Step 3. Categorise the disposable unit or units

The Recycle Check involves completing an individual checklist for each disposable unit. For each unit, determine the most common overarching and, if applicable, specific **material type** (see list below) to categorise the unit. The type of material that makes up at least 50% of the unit's weight determines what category the unit falls into. This is also referred to as the **target material**, see Section 4.

If none of the types of material make up more than 50% of the disposable unit, the disposable unit cannot be assessed using a Recycle Check. The packaging should then be adapted (see also paragraph 1.2 on legislation in this document).

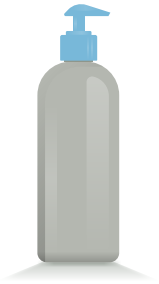
The types of material:

- **Rigid plastic**
  - PET bottle
  - Other PET (incl. PET trays)
  - PE or PP
  - Other rigid plastic
- **Flexible plastic**
  - PE
  - PP
  - Other flexible plastic
- **Metal**
  - Steel
  - Aluminium
- **Glass**
- **Paper/cardboard**
- **Beverage cartons**

To illustrate this, some examples are detailed below.

Example 1:
A hand soap container. The soap comes in a luxurious metal bottle with a plastic pump. The pump cannot be easily removed from the bottle. It is determined that the bottle and the pump make up one disposable unit, as explained in step 2. Only one checklist needs to be completed in this case, choosing steel packaging because more than 50% of the disposable unit is made of steel.

Figure 3. Hand soap container



Example 2:
A granola bar wrapper. The bars come in individual wrappers and are packaged with four in a box. According to the explanation in Step 2, it is determined that this packaging consists of five disposable units: the box and the four wrappers. To assess the packaging, a checklist must be completed for each disposable unit. In this case, choose a checklist for the cardboard box and a checklist for the flexible plastic wrappers. For several of the same disposable units, such as four identical wrappers, one checklist is sufficient.

Figure 4. Multi-packaging



In case of doubt as to what category a disposable unit falls into, please contact us using the KIDV Q&A.

Step 4. Determine the degree of recyclability

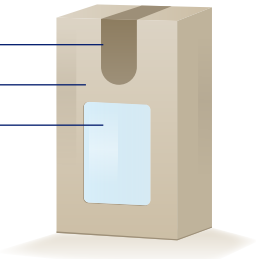
After choosing the appropriate Recycle Check to assess the recyclability of the disposable unit, the next step is to identify the **main component** and any **subcomponents**.

The main component of packaging is that which holds the product, and usually the component that makes up most of the packaging's weight. Besides its main component, a disposable unit often also has one or more subcomponents. These are added components, such as labels and closures, which are processed along with the main component in the recycling process.

The table on the next page shows some examples of how to identify the main component and subcomponents. More information on each material type is available in the material-specific background documents.

Table 3. **Determining main and subcomponents**

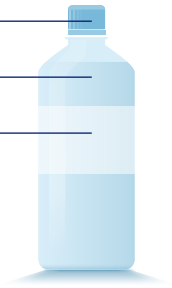
Subcomponent = tape
MAIN COMPONENT = box
Subcomponent = window



Single disposable unit

Example 1
Box (main component) with window and tape label (subcomponents).

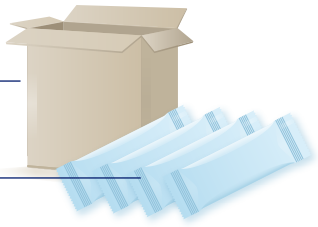
Subcomponent = closure
MAIN COMPONENT = bottle
Subcomponent = label



Single disposable unit

Example 2:
Flask (main component) with cap and label (subcomponents).

MAIN COMPONENT = box
MAIN COMPONENT = wrappers



Five disposable units

Example 3:
Box (main component) with 4 granola bar wrappers (also main components).

If there is any doubt about the difference between the main component and subcomponents of the disposable unit, and the above examples do not provide clarity, please contact us using the KIDV Q&A.

4. Target material and secondary material

What is the target material?

The target material is the material that will ultimately be recycled into a new raw material. Typically, this is the **most common material** in the disposable unit, often the material of the **main component**.

Exceptions: if a subcomponent (such as a heavy steel cap) is heavier than the main component, the subcomponent is the target material.

If a subcomponent **is made of exactly the same material** as the main component (e.g. paper label on a cardboard box or PE cap on a PE bottle), this counts towards the target material. Properties such as colour, additives and printing of these subcomponents must be taken into account in the assessment.

When does packaging have sufficient target material?

The target material must constitute at least 70% of the total weight of the disposable unit:

Target material weight / Total weight of the disposable unit x 100% ≥ 70

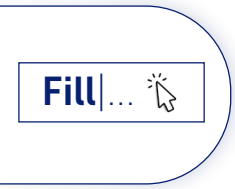
Secondary stream

Materials that are **not the target material** form the **secondary stream**.
These can affect the processability of the target material, but can also be recycled themselves if properly coordinated (design for recycling).

Example: returnable bottles made of PET with caps and labels made of PE or PP. The caps can be easily separated from the PET and can themselves be easily recycled as a secondary stream.

In **Part II**, you will find the material-specific information that goes with the checklist. See Section 6 of Part I for more tips and tools for sustainable packaging.

5. Manual for the checklist



Step 1: Creating packaging

Open the Recycle Check dashboard, add the packaging and fill in some information about the packaging being assessed and click 'Save' at the bottom of the page.



Step 2: Creating the disposable units of the packaging

Click the play button that says 'Edit packaging'. Click the green button for an explanation of how to identify disposable units. Next, add the disposable unit or units that make up the product-packaging combination. Each disposable unit of the packaging must be assessed separately.

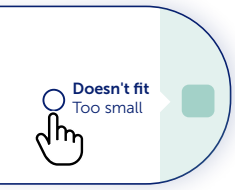
Step 3: Completing the checklist

Go through the corresponding checklist for each disposable unit by clicking the 'Start checklist' button. Upon opening the checklist, general information is provided that can be clicked away after reading. The questions include links to additional explanations for each material in the background document.



Step 4: The final score

Once all checklist questions have been answered, the 'Complete' button at the bottom of the list leads to the summary page, which gives you the final recyclability score for the disposable unit. The heading 'Final Score' shows how many questions from the checklist have already been answered. For example, if it says 8/10, then the checklist consists of ten questions and eight have been answered. As soon as the full list has been filled in, the box with the tick turns the colour that matches the checklist outcome (**optimal**, **reasonable**, **limited** or **non-recyclable**). If the packaging consists of multiple disposable units, proceed with the next checklist.



Important: data are saved locally while you are completing the Recycle Check. If you close the checklist when you are halfway through completing it, you can continue from the same computer at a later time; the previously entered details will still be there. You can only complete the list on another computer if you download the entire portfolio (see step 5).



Step 5: Saving and sharing results

The summary page offers the option to export the results to a PDF file using the 'Download PDF' button. If the packaging assessed consists of multiple disposable units, the checklists for all units of each packaging are included in one PDF export.

Tip: An empty Recycle Check can be downloaded by entering the packaging and adding a disposable unit, while not starting the checklist. When downloading a PDF, the checklist will be displayed as an empty list.

In addition, there is the option to download the entire portfolio, consisting of all completed checklists, so that, for example, a colleague can upload the entire set on their computer. You can do this by clicking the 'Export packaging' button in the top-right corner of the dashboard. This will download a .json file. An entire set can then be imported by clicking 'Import packaging' and uploading the .json file here.

! Some checklists use this symbol to mark questions as complex. This means that it is more difficult to determine the right score in one go (**optimal**, **reasonable**, **limited** or **non-recyclable**). In these cases, you can usually perform a test to see whether your packaging qualifies for a higher level of recyclability. For example, it may be necessary to perform a test in order to answer one of these questions. Two scores are possible for these types of questions. The Recycle Check automatically ticks the lowest score. After a positive test result, the higher score may be ticked. However, it is important to have proof of a positive test result on hand. Where possible, references to available protocols are provided; in some cases, such protocols have yet to be developed. For updates on this, see the KIDV's **protocols page**.

Tip: Answer all questions first and determine if a test can improve the final score. Some criteria later in the checklist mean that a positive test result will not result in an improvement in the final score of the check. For example, when a test has to do with a disposable unit's sortability and it does not score optimally on recyclability to begin with. Of course, it may still be wise to perform the test to gain more knowledge about this particular aspect.

6. After the Recycle Check: tips and tools for sustainable packaging

If you want to up your sustainable packaging game, the KIDV's **7 tips** will get you off to a good start. This section will further explain what other information and tools the KIDV has available to help you get started with sustainability.

6.1 Disposal Guide

The **Disposal Guide** makes it easier for consumers to dispose of packaging waste the right way. Research shows that there is strong support among consumers for separate collection, but they need to know which bin to put their waste into. Disposal Guide logos on packaging encourage consumers to put the packaging into the right waste stream after use so that it can be optimally processed and recycled. The logos are available
from the KIDV on request.

6.2 E-learnings and training

Sustainable packaging is so much more than just changing or reducing the amount of packaging material. To provide guidance on this, the KIDV has developed a number of e-learnings:

- **Packaging recycling in the Netherlands**
  Using real-life examples, the KIDV provides insight into the collection, sorting and recycling of different kinds of packaging. This e-learning module covers every packaging material: rigid and flexible plastic, glass, metal, and paper and cardboard.

- **Plastic packaging sorting and recycling processes**
  To add further depth to the 'Packaging recycling in the Netherlands' e-learning module, the KIDV has developed this more technical module. This module further explains the basic techniques used to sort and recycle plastic packaging, going into things such as the influence of packaging design on the various sorting and recycling processes.

- **Five perspectives on sustainable packaging**
  When developing successful sustainable packaging, several aspects must be taken into account. Consider the packaging process and logistics, for example, as well as customers' purchasing and disposal behaviour and the company's packaging and sustainability strategy. The **Five perspectives on sustainable packaging® KIDV model®** covers the main approaches. This model allows you to zoom in on issues of importance in specific situations from any angle, with background information, tips and examples that can help you on your way. In this e-learning module, the KIDV shows people how to use the model, using real-life examples and assignments that apply specifically to their own packaging practices.

- **R-strategies**
  The next step is turning the opportunities and threats into actual actions, such as redesigning your packaging. The so-called R-strategies are strategies that can be applied to make packaging or a product-packaging combination more sustainable. This e-learning module goes into the specifics of using the R-strategies through real-life examples and assignments.

Training programmes

In addition to the e-learnings, the KIDV offers **training programmes**, with packaging experts introducing participants to both the theory and practice of sustainable packaging. This kind of training adds value in that it lets participants practise using the theory under the guidance of a packaging expert. There are also opportunities to ask in-depth questions and to network with other businesses. The knowledge and skills gained during this training can subsequently be harnessed in formulating your own packaging sustainability strategy and applying practical tools in your own practices.

6.3 Further information

The KIDV website features fact sheets, publications, and tools on various topics in the sustainable packaging domain. A few of them are presented below.

Fact sheets

- When can a company put an environmental claim on its packaging and when is it being made falsely and potentially misleading to consumers? The KIDV has prepared the **Environmental Claims Fact Sheet** on this subject, describing the legal frameworks for these claims, using some common examples.

- Bio-based and bio-degradable packaging materials can often help reduce CO_2 emissions and reduce demand for fossil resources. At the same time, whether these materials are a good alternative also depends on the product being packaged. For more information on these materials, their potential and the issues involved, see the **Bio-Degradable Packaging and Bio-Based Plastic Packaging Fact Sheet**.

- The KIDV's **Symbols on Packaging Fact Sheet** provides an overview of logos that consumers may find on packaging, as well as their origin and meaning and whether their use is mandatory or voluntary.

- The KIDV has put together a comparison of the use of **Disposal Guide logos on packaging in different European countries**. This overview makes it clear to companies which logos are used in those countries, whether that is voluntary or mandatory, and where companies can find information about the regulations that apply there. The KIDV also manages the **Dutch Disposal Guide**.

Dossiers

Take a look at the KIDV's dossiers to gain insight into the latest developments, get practical examples and read about focus points in making packaging sustainable. The dossiers are specific to sectors or industries and to relevant topics around sustainable packaging, such as chemical recycling and reusable packaging. Click **here** for the dossiers.

- What legislation (directly) affects the design of packaging and the reuse or disposal of packaging waste after use? The KIDV has plotted information on laws and regulations on a **clear timeline**. The timeline contains background information and links to the specific legislation itself.

- Manufacturers and/or importers that place packaging on the Dutch market are responsible for ensuring that their packaging complies with the so-called '**essential requirements**'. These pertain to the composition and nature of the packaging to minimise their volume and weight and ensure they are suitable for reuse and recovery of the materials.

- Packaging affects consumer behaviour when they purchase, use and discard products and their packaging. Sustainable packaging can, therefore, also contribute to sustainable consumer behaviour. Read more about **consumer behaviour** here.

- How consumers interact with packaging also partly determines the sustainability of packaging. Based on scientific research on consumer behaviour, the KIDV has compiled an overview of key insights. The **Sustainable Consumer Behaviour Tool** is a set of three tools that companies can use - particularly for food packaging - to look at sustainable packaging from a consumer perspective.

Reuse

To reduce the environmental impact of packaging, **reuse** can be an effective strategy. Unlike single-use packaging, the energy it takes to produce the packaging is distributed over the number of use cycles, which can greatly reduce the environmental impact of producing the packaging per use cycle.

This reduction does need to account for additional steps relative to single-use packaging, such as cleaning and transportation. A saving in environmental impact (and costs) when switching to glass packaging reuse depends on this, as do the return rate, the life of the packaging and transportation distances. Scale can also have a significant effect, particularly on costs, as it allows investments in (cleaning) equipment and more efficient processes to be recovered more quickly. To determine whether switching to reusable packaging could be an attractive option, the KIDV has developed a **Calculation Tool**.

Sustainable Packaging Compass

The KIDV has developed the **Sustainable Packaging Compass** as a tool to provide insight into the recyclability, circularity and environmental impact of packaging. This does not only indicate whether the packaging is recyclable, but also to what extent the packaging is circular. The tool also gives an indication as to the packaging's environmental impact.

Companies can harness these insights to compare different units of packaging and types of packaging, assessing their scores on various aspects of sustainability. They can then use this information to set sustainable packaging objectives and quantify the effects of packaging optimisation. There is also the opportunity to get an indication of possible fee modulation for rigid and flexible plastics.

State of Sustainable Packaging

This KIDV publication offers a strategic perspective on the collaboration and innovations needed when it comes to sustainable packaging, identifying social and economic obstacles that stand in the way of sustainable packaging.

More information

If you have more questions about the Recycle Check or about making packaging more sustainable, contact the KIDV through our **Q&A**. For more information about making packaging sustainable, go to our **website** or sign up for the KIDV newsletter **here**.

Netherlands Institute
for Sustainable Packaging
part of **verpact**

Part II: Recycle Check Glass Packaging 2026

1. Introduction

Part II of this document provides background information to support the Recycle Check for glass packaging. It provides additional information on collection, sorting and recycling. All matters that are the same for all materials are covered in Part I: The basic information is the same in each background document. It includes things such as the definition of recyclability, how to choose and use the Recycle Check correctly and how to make packaging more sustainable.

Part I lists all the definitions that are important for conducting a Recycle Check. The following are some definitions that are specific to glass packaging.

For definitions of all the terms used in this document, see the **Packaging glossary** on the KIDV website.

2.1 Definition of glass packaging

This Recycle Check is intended only for glass packaging, not for glass objects. See Part I, Section 3 for more information about what constitutes packaging.

Glass objects such as tea and beverage glasses, oven dishes and mirrors, as well as vases, (car) window panes and plexiglass (although technically not glass) are obviously not classified as packaging. Consumers are supposed to bring these objects to the municipal waste collection facility. They fall outside the scope of this Recycle Check.

Various types of glass packaging may end up as household waste. Think of beverage bottles for example, as well as jars and bottles for condiments or care products, such as deodorant rollers and perfume bottles. In general, consumers dispose of these types of packaging in the bottle bank, after which they are recycled. Caps, lids and labels may also be disposed of in the bottle bank alongside the glass packaging.
Many consumers incorrectly believe that packaging made from ceramic, stone or porcelain can go in the bottle bank as well. Think, for example, of jugs for bitters or oven dishes for pre-baked desserts. However, these types of packaging and products belong in the residual waste stream and therefore fall outside the scope of this Recycle Check.

The Waste Disposal Guide has been developed to help consumers determine which packaging goes in which bin/bag. More information about this can be found at **kidv.nl/weggooiwijzer**.

2.2 Household and commercial waste

The Recycle Checks apply to packaging that ends up in household waste. Municipalities in the Netherlands determine for themselves how their residents can dispose of glass; the most common option is bottle banks in the street, but some municipalities collect glass from door to door.

What consumers may and may not throw away in a bottle bank is determined by Stichting Duurzaam Verpakkingsglas. The rules are kept as simple as possible to encourage consumers to take their glass to the bottle bank as much as possible.

Figure 1. Glass separation tips



Compositions can vary between all colours separated (uncoloured, green and brown glass), separation of uncoloured and coloured (green and brown together) or everything together in a single collection container. Post-separation is not a common route for glass, as glass is not sorted or recovered from the bottom ash, as is the case with metal.

Similar waste streams, such as waste from the catering industry, offices, shops and service companies, can also be assessed using this Recycle Check.

2.3 Sorting and recycling

A number of steps are required to properly sort and recycle glass. The first step starts with the consumer. When glass is thrown away, most municipalities offer the option of separating the glass by colour; brown, green and uncoloured glass. This is important as no further sorting by colour takes place after that. Read more about this in 3.3.

All glass is collected and broken. The latter often happens in the bottle banks. The glass that arrives at the recycler is stored outside, where most organic contaminants, such as food waste, are washed away by the rain. The first visual sorting step is performed by employees who specifically look for impurities in the recycling stream. This includes plastic packaging components and objects, or organic material.

After this visual sorting step, the glass is moved on for continued processing. The glass is further broken into easily processable shards and the shards are 'dry washed' using a large drum to remove the labels using friction; read more about this in 3.7. In addition, NIR (near-infrared) scanners are used to sort out foreign elements such as stone, porcelain and ceramics, and plastic parts such as lids. This is done on the basis of light permeability, read more about this in 3.4. Sorting methods include the use of a magnet for magnetic metals, an eddy current machine for non-magnetic metals, and wind shifters for labels and light subcomponents such as corks. You can read more about this in 3.7.

2.4 Points of attention for disposable glass units

Part I explains the steps for determining how many disposable units a package consists of. When dealing with a disposable glass unit, an additional point needs to be considered, namely the diameter of the unit.

Consumers normally dispose of their glass packaging waste in bottle banks. These containers usually have apertures with diameters of 160 or 230 mm. If a bottle or jar cannot fit through this aperture, there is a high chance that the packaging will not end up in the correct waste stream. In that case, the packaging cannot be defined as recyclable according to the definition used by KIDV (Part I, Section 2).

Consumers may dispose of glass packaging containing loose subcomponents of another material as a single disposable unit. For example, a peanut butter jar with a plastic lid and paper label. Although the lid can be disposed of as a separate unit with plastic waste, this is not generally the norm, nor is it recommended by the industry.

This means that there is a deviation from the general provision for disposable units as set out in the basic document. The following applies to glass packaging:

Table 1. **Points of attention for disposable glass units**

Packaging with components, such as a screw cap, that come loose when the glass components break. With some packaging, components become detached during the collection and sorting process, such as glass jars with screw caps.	 Jar with screw lid	***Example 1:*** *In the case of glass, packaging together with the lid may be thrown away in the bottle bank, even if it is not a glass component. When the glass breaks, the lid comes loose and is further processed as a separate unit.*
	 Bottle with full body sleeve without bottom	***Example 2 :*** *A full body sleeve that is not glued to the glass and that does not cover the bottom is considered a loose disposable unit. The glass will fall out of the sleeve after breaking in the sorting process, provided the opening is large enough.*

3. Recyclability focus points

This section describes the extent to which the main component of packaging is recyclable.

3.1 Target material

In addition to the main component, packaging often also consists of subcomponents, such as caps, labels, tags, release liners and sleeves. During the sorting process, the recycler aims to sort the main component, made of the **target material**. More about this can be read in Part 1, Section 4. The subcomponents of glass packaging are usually incinerated as residue.

Circularity

Glass recyclers have set up their process to recycle as much glass as possible. All non-glass parts are sorted out. This includes the labels, lids and other subcomponents that are added to a disposable unit. Although these subcomponents may be disposed of along with the packaging in the bottle bank, it is **not** the main goal of recyclers to ensure that this residual stream can be further processed. Metals can still be offered for recycling, as the quality is still sufficient to create a profitable secondary stream. This is not the case with other residual streams, such as plastics, paper, cork, ceramics, stone or porcelain. These are therefore offered for incineration as it is not economically viable to process them further for recycling. The residual stream is sometimes used for low-value applications such as road raising.

All non-glass subcomponents, except metals, are therefore **not** recycled. This therefore forms a point of attention for the producer/importer from a circularity point of view. By minimising the amount of non-glass subcomponents, material loss is prevented.

3.2 Disruptors

Disruptors are substances added to glass that negatively affect its recyclability. They can often penetrate deep into the recycling process and cause the glass, and sometimes even an entire batch, to be rejected. Avoiding such disruptors therefore not only ensures a more recyclable disposable unit, but also greater efficiency in the entire recycling process, with less risk of material loss.

Ceramics, stone and porcelain

Ceramics, stone and porcelain, collectively referred to as CSP, are not glass and therefore behave differently than glass in a glass furnace. Ceramic and porcelain are made from different compositions of clay and metal oxides and/or salts. The exact composition of these raw materials differs depending on the application. Contrary to glass, the materials cannot be melted down after being fired. The CSP fraction thus disrupts the recycling of glass. The percentage of packaging that contains this type of combination of components is relatively small these days. However, it is still being used on a small scale. Think, for example, of the ceramic cap of a swing-top bottle.

If ceramic, stone or porcelain are disposed of in the bottle bank and are not removed from the glass stream during sorting, the residues will negatively affect the quality of any new glass made from the glass recyclate. These residues form so-called inclusions, causing weak areas in glass packaging. As a result, the new glass may crack or break when subjected to stress, for example during the filling process in the factory or due to shocks during transport.

At the glass recycling facility, the glass packaging material is broken down, cleaned and separated from contaminants using a series of sorting steps. To determine whether the pieces of packaging material on the conveyor belts in the sorting facility are glass, their translucency is assessed. During this step, the CSP fraction is separated from the glass as much as possible. If a ceramic, stone or porcelain component/additive does not come loose from its packaging during the crushing stage, there is a high risk that it will enter the glass furnace as contamination, resulting in it becoming an inclusion in the new glass.

Crystal glass

Crystal glass (also called leaded glass) has a different composition than packaging glass, partly due to the addition of lead. Examples of crystal glass packaging include deluxe bottles for water or alcoholic beverages. However, crystal glass is mainly found in glass objects such as carafes or wine glasses, which do not belong in glass recycling.

The high concentration of lead gives crystal glass a different refractive index, shine and hardness, resulting in a beautifully clear glass. In addition, crystal glass has a lower melting temperature due to the addition of lead. Although in small quantities this does not have a negative effect on the recycling of glass, the added amount of lead does create a cumulative effect. If too much crystal glass ends up in the regular glass stream, the legally permitted maximum amount of lead in packaging may be exceeded.

In the production of packaging glass, the average quantity of lead measured over a one-year period may not exceed 200 parts per million (ppm). This is specified in **European Directive 2001/171/EC** and included in the aforementioned **Packaging Management Decree 2014, Article 2**. There will be a delegated act in the PPWR that will replace this. To ensure that the quantity of lead in glass does not exceed this legal limit, crystal glass is avoided in glass recycling.

Heat-resistant glass

Heat-resistant glass, which has a significantly higher melting point than normal packaging glass, is made by adding borosilicate during the production of glass.

Because borosilicate is more resistant to large temperature differences, it is extremely suitable for applications such as oven dishes and tea glasses, but also for some types of packaging. Examples include glass trays containing crème brûlée, which consumers prepare in their ovens at home. However, heat-resistant glass is increasingly being phased out because it causes problems in recycling.

This is because heat-resistant glass mixed with packaging glass in the recycling is difficult to recycle. Due to the higher melting point of heat-resistant glass, it will not melt (completely) at the temperature at which packaging glass melts. This can create stresses in the newly made glass. These stresses can cause the new glass to break during processing and filling of the new packaging. This can result in safety issues in the glass factory. This makes heat-resistant glass a disruptor so using heat-resistant glass for packaging is not recommended.

3.3 Colour

Glass is produced in a range of colours. The most common colours are green, brown and uncoloured glass, in its transparent form. Depending on the processor, uncoloured glass may also be referred to as clear glass, white glass or flint. The commonly heard term "white glass" is sometimes used incorrectly: opaque white glass goes through a markedly different recycling process than transparent, uncoloured glass. The Recycle Check therefore uses the term **uncoloured glass**.

A large percentage of recycled glass is used in the production of new glass. This recycled glass is sorted by colour and then melted down to make new glass. Despite the fact that used glass is first sorted by colour, colourants have to be added to the new glass to create the desired colour. Changing the colour of glass (recolouring) in a furnace is a costly process. For that reason, the three most commonly used colours (uncoloured, green and brown glass) are used as much as possible. It is not profitable to collect differently coloured glass, such a red or blue, separately and melt it down in separate furnaces. Instead, the other colour fractions are mixed in with the existing colours to a limited extent.

On average, packaging glass produced in the Netherlands consists of 45 to 92% of recycled glass shards. The exact percentage depends on the colour of the new glass:

- Uncoloured glass: 45 – 60%
- Green glass: 85 – 92%
- Brown glass: 70 – 85%

Depending on the colour stability of the recycled glass, the exact percentages may be higher or lower. More shards are possible in green and brown glass, because colour variation is less noticeable by the consumer in this case. It is easier to add blue or red glass without significantly affecting the colour of the new glass. For uncoloured glass, this margin is much smaller and contaminants are much easier to see, which can cause strong green discolouration of the uncoloured glass. For many producers this is undesirable.

3.4 Light permeability

During the sorting process, the glass is sorted using optical waste separators to remove all ceramic, stone and porcelain from the stream. Opaque glass is nearly always incorrectly recognised as a disruptor and removed from the stream alongside ceramic, stone and porcelain. There are various reasons why glass may seem opaque:

Table 2. Light permeability

Thick-walled and/or colour too dark	The optical scanners cannot recognise glass as such if its walls are too thick or if its colour is too dark. For example, if the glass is very dark brown or purple. Similarly, the bottom of a heavy bottle (e.g. a champagne bottle) may be thick to the extent that it becomes insufficiently translucent.
Black glass	Black glass is often recognised as KPS fraction, because the optical scanners do not recognise the black glass as glass. This makes it unlikely that it will be recycled. If black glass is indeed recognised as glass, it will have a disruptive impact on the colour quality of the recyclate in further recycling. Black glass can be mixed with coloured glass in small quantities.
Chemical treatment (*Frosted look*)	Certain chemicals can be used to change the appearance of glass. For example, acid can be used to create a *frosted* appearance by etching the surface of the glass. If such a treatment affects the translucency of the glass, it will become less recyclable.
Coatings with a light barrier	If the glass is insufficiently translucent because of its coating, the scanners will not recognise it as glass. Think, for example, of a beer bottle made to look like a jug by adding a special coating. Some types of coating do not affect the translucency of glass, although they do affect its recyclability. Read more about this in 3.5 Coatings.

Glass recyclers currently investigate how to recover glass that has ended up in the ceramic, porcelain and stone fraction. This can be recognised by the chemical composition of the material. That would make it possible to recover recyclable glass from the CSP fraction. It is unclear when this technique will be ready for practical application.

3.5 Coatings

The glass packaging industry uses different types of coatings:

- Coatings that can alter the appearance of glass to the extent that it is no longer recognised as glass during the sorting process. Examples include coatings to make a glass bottle look like a stone jug or to make the bottle less translucent. These impede the sorting process (and therefore the recycling process) of the glass.
- Glass can also have a coating and still be recognised as glass during sorting. For example, a transparent coating that is added to alter the colour of the glass. In that case, the glass will make it through the sorting process as intended, but the coating will contaminate the glass bath. This can have a negative environmental impact if the contaminants are vaporised and not properly purified.

If the coated glass ends up in the glass furnace, the coatings (often made of plastics or containing heavy metals) act as contaminants during the production of new glass. Substances in the coating can evaporate so glass furnaces have special filters to prevent these substances from entering the environment. This makes such coatings less desirable in glass recycling.

An exception are *cold end coatings* and *hot end coatings*. These coatings are added to glass during the production process. They are designed to reinforce the glass and reduce the risk of breakage. These coatings are necessary and do **not** have a negative effect on recycling.

3.6 Environmental impact of chemicals and (heavy) metals in glass packaging

To enhance the properties or visual characteristics of glass, additives (such as chemicals and metals) can be added to glass. One of the most common practices is adding lead to make crystal glass (see 3.2 Disruptors). Other examples include the addition of substances such as fluorine (for opal glass), copper and cobalt (to make glass stronger or give it a certain colour).

These substances vaporise when incinerated, either in the waste processing facility or the glass furnace itself. The vapour has a negative effect. Glass furnaces have special filters to prevent these substances from entering the environment. When too many heavy metals end up in a furnace, the effectiveness of the purification process is compromised and the harmful substances may be released into the environment.

The presence of chemicals and heavy metals has a negative impact on the lifespan of the glass furnaces. However, these substances do not affect the recyclability of the glass itself. They are therefore not listed as disruptors in this Recycle Check. Limits have been set for the use of heavy metals in packaging (see the **essential requirements** - which will eventually be replaced by a delegated act in the PPWR). Due to legal limits and the negative effects on glass furnaces and the environment, it is desirable to avoid the use of heavy metals in packaging glass as much as possible. This can motivate to make packaging more sustainable and, where possible, to reduce or avoid the use of these substances in the glass and in the subcomponents (for example in the printing inks on labels). In the Netherlands, these types of chemicals are generally avoided, but this should be taken into account when importing glass.

3.7 Closures and subcomponents

Glass packaging almost always contains one or more subcomponents. Subcomponents include all non-glass components of a package (e.g. labels, closures and caps). For this, see also Part 1 Section 3.

All glass packaging is crushed and guided through the sorting facility on a conveyor belt. Various sorting techniques are used to remove unwanted components and parts from the glass stream. An important distinction here is whether the subcomponents become detached from the glass.

Below are some points of interest for the various subcomponents.

Non-glass, fixed subcomponents

The first step in the sorting process is to remove labels. In a rotating drum, labels and other non-glass components are separated from the glass using friction. After this process, also called "dry washing", the material ends up on a conveyor belt and is guided through a number of sorting steps.

Non-glass components can generally be separated using NIR scanners (for plastics), optical scanners (for ceramics, stone and porcelain), cyclone shifters (for lightweight materials such as paper and cork), magnets (for magnetic metals) and eddy current technology (for non-magnetic metals).

Example
Paper labels can be easily separated from the glass by friction. The paper labels are then extracted with a cyclone shifter and offered for incineration.

However, if they remain attached to the glass, they may end up in the glass furnace or cause the glass to be removed from the glass stream alongside non-glass components.

Example
A decorative wax seal on a luxury bottle of liquor or an expensive perfume won't come off the glass and ends up in the furnace. The seal melts and evaporates. The furnaces have special filters to prevent harmful emissions into the environment.

Although the non-glass components that remain attached to the glass do not necessarily have a negative effect on the quality of the new glass, they are undesirable in glass recycling due to the contamination in the furnace.

Example
A self-adhesive transparent plastic label remains attached to the glass. The NIR scanner recognises the plastic but not the glass that is still attached to the label, which is therefore sorted into the plastic stream.

Fragments that remain attached to non-glass subcomponents are removed from the further recycling process when sorting and taking out the non-glass components. As a result, the recycler loses some of the recyclable glass and the efficiency of glass recycling decreases.

Full-body sleeves

In the glass container and/or at the sorting facility, glass is broken down into shards. If the glass is wrapped by a full-body sleeve with closed bottom, chances are that the glass will not break enough or remains enclosed in the sleeve. In the latter case, the glass is not recognised as such in the sorting facility and it will end up in the non-glass fraction together with the sleeve. This (part of the) glass will therefore not be recycled.

This problem can be solved by designing the packaging in such a way that the glass can easily be separated from its sleeve and remain attached to or enclosed in the sleeve during sorting. This can be achieved by leaving the bottom of the sleeve open or, if glue is needed, using glue that comes off easily. The sleeve can also be provided with a perforated edge, which makes it easier to tear when the glass is crushed.

Non-magnetic metal brackets

Non-magnetic metal components can be sorted during the sorting process using the eddy current technique. For this it is important that the metal parts come loose from the glass when it is crushed in the *crusher*. This way it can be easily separated from the glass fraction. Braces are difficult to separate because of their shape, weight, and/or the alloy they are often made of.

Non-magnetic metals are detected using the eddy current technique. The electrical field generated by the eddy current gives non-magnetic metals a magnetic charge so they can be removed from the glass fraction with a magnet. Due to the shape of the brackets, they are very difficult to separate from the glass and often unintentionally reach the glass fraction.

Figure 2. Clip top jar



If the metals reach further stages of the production process of the new glass, they can negatively affect the quality of new glass.

Caps, corks and lids

Consumers can dispose of the caps, corks and lids that come with glass packaging in the glass container alongside the glass itself, even though these components are not made of glass. Examples include steel lids on jam jars, aluminium caps or corks on wine bottles or plastic screw caps on peanut butter jars. Sorting facilities are designed to separate these components from the glass. As long as the components are fully separated when the glass is crushed, they do not impede the recycling of the glass.

Design tip

When designing glass packaging, add as few non-glass components to the design as possible to minimise the risk of disrupting the recycling process. If non-glass components have to be added, make sure these components can easily be separated from the glass stream using proven techniques such as eddy currents, magnets, cyclone shifters or NIR scanners. If possible or needed, consult the recycler to identify any points of attention. Make sure that the non-glass component is separated from the glass during the sorting process and that this stream has sufficient volume for sorting and collecting.

4. Additional sources of information

- KIDV Packaging Glossary
- KIDV packaging policy and legislation
- KIDV Disposal Guide

Checks and guidelines (this list is not exhaustive)

- European Federation of Glass Packaging Makers (FEVE)
- Framce – CITEO
  Règles de recyclabilité TREE - Test de recyclabilité des emballages.
- Italy – CONAI
  Glass annex
- Austria – FH Campus Wien
  Packaging Design Guideline

Other sources

- Specifications developed by Maltha Glas recycling
- Milieu Centraal – Waste Separation Guide
  What can be disposed of alongside glass?
- Nederlandse Brouwers
- Stichting Duurzaam Verpakkingsglas
- European Federation of Glass Recyclers
- Recyclingplatform
  Recyclingplatform Recycling processen glas
- Netherlands Institute for Sustainable Packaging (KIDV). (2021)
  Dossier of European laws and regulations for packaging.



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