

Protocol

Compact I



Committee for Studying the Behaviour of
Packaging in Sorting Centres (COCET)

PROTOCOL

Compaction test



WWW.COCET.FR/EN/

To contact us:

<https://www.cocet.fr/en/contact-us/>

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Introduction

COCET

The mission of the Committee for Studying the Behavior of Packaging in Sorting Centers (COCET) is to help designers and decision-makers develop household packaging that can be sorted in French sorting centers. The committee includes various stakeholders in the value chain for sorting household packaging (Citeo, Derichebourg Environnement, Pellenc ST, Sepur, Tomra) and works on all types of household packaging (bottles, dispenser bottles, pots, films, cartons, bags, etc.) made of all kinds of materials, except glass. COCET's scope of action begins as soon as the packaging is placed in the yellow bin by the consumer and continues until it exits the sorting centre or pre-sorting center in case of plastic packaging. The test protocols established by COCET are the result of work carried out by sorting industry stakeholders and a consensus on their representativeness.

This **Compaction test protocol** was drawn up by COCET. It is representative of the compaction-based waste collection system most commonly used in France. This protocol is available to manufacturers who wish to evaluate, under real-world conditions, the impact of compaction that occurs in recycling collection trucks in France.

This protocol involves contacting a local government and an associated sorting center, and requires precise logistics, as described in this document.

Version no.	Date	Description
I	June 2026	Initial version

I. Scope

The **Compaction test protocol** focuses on the collection and transport of household packaging (excluding glass) by dump trucks used for household waste. During this stage, physical stresses are applied to the packaging. These stresses can cause deformations, whether reversible or not, in the packaging's condition and affect its sorting at the sorting center. This is particularly true for packaging containing multiple associated components, which may or may not be separated through compaction.

This protocol:

- Applies to **household** and similar packaging,
- Does not apply to industrial and commercial packaging

Its scope:

- Covers the collection and transport stages using dump trucks
- Does not include how the consumer sorts (contrary to the COCET [Protocol Sep I](#))
- Does not include the physical stresses applied to packaging at sorting centers



Figure 1 Scope of the COCET Compaction Protocol

This protocol applies to packaging, whether it is already on the market or not (prototypes). This protocol offers the advantage of allowing users to directly introduce the packaging samples they wish to test, selecting them freely, and to pre-identify them (by marking them with colored paint), which facilitates their retrieval during the unloading process.

However, since its implementation requires placing the tested samples into consumers' sorting bins, consumer behavior is not included in the scope of this study; only the collection and transport by dump truck are considered.

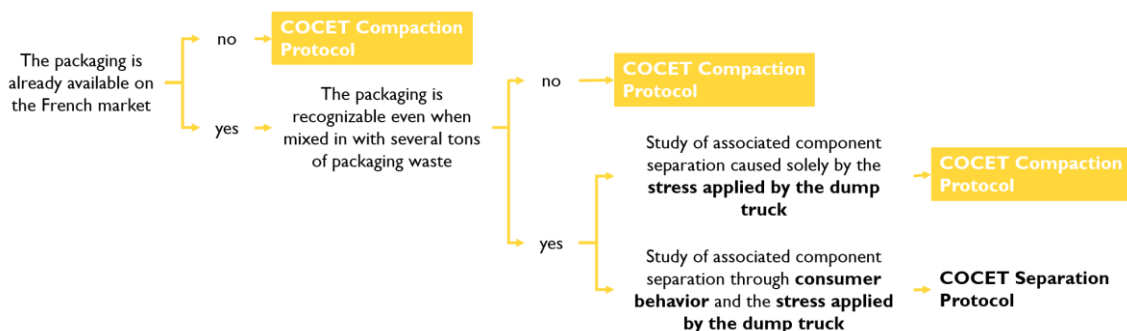


Figure 2 Determining the Use of the COCET Compaction Protocol

II. Aims

This protocol assesses the impact of collection and transport by dump truck on the condition of household packaging upon arrival at a sorting center, and more specifically on the **separation of components associated with the main body of the packaging**.

This protocol does not assess the impact of consumer behavior on the condition of the packaging, nor its suitability for sorting at a sorting center, nor its recyclability.

This protocol is intended for industry stakeholders seeking to independently assess the separation of combined components during collection and transport under compaction conditions. Tests performed by an industrial operator in accordance with this protocol are not eligible for a specific COCET Notice. Should they wish to do so, the Requester may share the results with COCET, which may, where appropriate, consider whether the separation issue warrants further consideration as part of a General Notice.

The tests should be conducted in accordance with the procedures described in this protocol to ensure that the results are representative and to determine whether the associated components under study are systematically separated during the collection and transport stages using a dump truck.

III. Terms of reference

Any company (packaging manufacturer, marketer, producer, resin manufacturer, distributor, etc.) wishing to assess the separability of packaging components during collection and transportation involving compaction may use this protocol to conduct a test.

The company wishing to perform compaction tests shall be referred to hereafter as **"Requester"**.

IV. Packaging eligible for testing

To ensure that the tests are representative of the French selective collection system, the tested packaging must comply with the parameters outlined below. Failure to do so may lead COCET to reassess the analysis and interpretation of the results.

Eligibility criteria for the packaging to be tested

- I. The packaging should be household packaging as sorted by the consumer, consisting of all components that may remain attached at the time of sorting after the product has been consumed, as defined in Citeo's recyclability methodology¹.
The packaging to be tested consists of a main component specifically sorted by the consumer and any associated components. A definition of "main" and "associated"

¹Recyclability methodology: <https://tree.citeo.com/en/>

components, and an illustrative list of elements generally considered as main or associated components are provided in the recyclability methodology.

2. Individual packaging components (e.g., jars alone, lids alone, sleeves alone) cannot be tested according to this protocol.
3. The various components whose separability is to be evaluated (sleeve, lid, etc.) will be attached to the main body of the packaging. If, in practice, an associated component is necessary to maintain this attachment, it must be present for the tests to be conducted (seal, etc.).
4. Packaging may be new or used but should be emptied of its contents.

V. Procedure for Requesters

Stage 1: Contact COCET

The Requester contacts COCET via the [contact page](#) on COCET's website, describing its request with the help of the document in 0. The Requester will precisely define the packaging to be analyzed as part of the study and will document the components that are likely or expected to be separated.

Stage 2: Contact with the municipal authorities / sorting center

The requester must identify a municipal authority and a sorting center where the sample can be tested.

The municipal authority should meet these criteria:

- Collection should be door-to-door, and the sorting bin must be “multi-material”, meaning it should contain all plastic and metal packaging, as well as cardboard and graphic paper
- Packaging left in bulk, without bags

Note: COCET can help in finding a municipal authority and a sorting center.

Once the municipal authority and the sorting center identified, Annex I should be filled out and submitted to COCET for approval. The test may then be launched.

The Requester will discuss the financial and logistical details with the municipal authority:

- Date and time of the streets concerned by the collection of the dropped off samples
- Information for residents on how to place packaging in the designated sorting bins,
- Time the dump truck will pass by to collect the sorting bins and time of its arrival at the sorting or unloading center, as well as details regarding the sorting center (time and location of counting, required PPE).

Finally, to conduct the compaction test (deposition, retrieval, and samples counting), the Requester shall select a trusted third party with no interest in this separation and shall document that party's identity.

Stage 3: Prepare the samples to be tested

100 samples per reference are required to perform the test. The samples should be identifiable: each component of the packaging should be marked (with water-based spray paint, for example) and then associated with the main body of the packaging.

The report will include a photo of the 100 packaging items prepared.

Stage 4: Preparing the deposit plan

In coordination with the municipal authority and taking into account the household packaging collection scheme, several streets shall be selected. Within each selected street, one sample per reference shall be placed in the sorting bins, at a rate of one sample per bin.

Since each reference tested consists of 100 samples, it will be necessary to set aside approximately 100 sorting bins when identifying the streets.

VI. Testing

Procedure

A. Samples deposit

Samples (100 per reference) should be placed in the sorting bins before the collection truck arrives. When filing the samples, they should be placed in the bins designated by the municipal authority, along with their associated components.

1 sample per reference should be placed in one sorting bin, in bulk.

If multiple references are being tested as part of the same test, the different references may be placed in the same bin (always 1 sample per reference per sorting bin).

B. “Unloading of material” and counting of samples upon arrival at the sorting center or at the unloading site

Once the waste has been collected and transported, it will be unloaded from the truck.

Note: It is recommended to unload the material onto a flat, clean surface, away from any traffic, to ensure safety, and to divide it into three piles to make it easier to locate samples.

The samples to be tested are collected from the deposited material for characterization.

The search is conducted by hand using tools (rakes, shovels) to dig through and turn over the packaging.

Note: It is the responsibility of people doing the test to follow the industrial site’s safety standards and to equip themselves accordingly (required PPE, tools).

Visually counting the recovered packages makes it possible to determine, for each reference tested, the number of recovered packaging samples and the number of lost ones, and to distinguish between those with separate, combined, or interlocked components.

The report will include photos of the packaging that was found and categorized (associated, separate, and nested components).

VII. Results and Analysis

A. Calculation method and measurements

Glossary

« **injected** »: Number of samples placed in the sorting bins at the start of the test

« **separated** »: Number of main body samples (jars, bottles, etc.) found on their own, completely separated from all their associated components.

« **partially separated** »: Number of main body samples (jars, bottles, etc.) found with part of the associated component(s).

« **associated** »: Number of main body samples found with the component whose separability is being studied (lid, sleeve, etc.).

« **recovered** »: Number of samples recovered at the sorting center's intake area, which is the sum of **separated**, **partially separated** and **associated** packaging.

Case of « **interlocked** » items: If samples are found interlocked with other packaging, there are two possible scenarios:

- It is possible to determine whether the sample is classified as **associated**, **partially separated**, or **separated**: the sample is then counted in the corresponding category (**separated**, **partially separated** or **associated**)
- If the sample's classification cannot be determined, the package is recorded as **interlocked**.

Notes:

- *Interlocked packaging is an issue related to consumer behavior and/or collection in its own right, but it not part of this protocol.*
- *“interlocked” packaging is not included in the “recovered” packaging count because interlocked items are difficult to identify and could be counted twice. For example, in the case of an unidentifiable interlocked sample: if its lid is attached, the package is counted only once; but if the lid is separated and interlocked inside another packaging, with no way to verify the presence of the corresponding jar, this may result in a double count.*

Example: A case involving primary packaging in the form of a jar with a seal and a lid.

- The **injected** packaging consists of the 100 samples placed in the sorting bins, comprising the jar, the seal, and the lid
- **Separated** packaging are those for which only the jar was found, with neither a seal nor a lid.
- **Partially separated** packaging are found with the seal still attached (either fully or partially), but without the lid.
- **Associated packaging** is found with the seal and the lid still attached to the jar.
- **Recovered** packaging consist of **separated**, **partially separated** et **associated** packaging.
- Interlocked but identifiable packaging, such as a single jar interlocked inside a tin can, is counted as **separated** packaging.
- Interlocked but unidentifiable packaging, such as a jar where it is unclear whether the lid and/or cap are still attached or have been separated, are classified as “Nested”.

Calculation of the loss rate

The loss rate ensures that the results are representative. It is calculated using the following formula:

$$\% \text{ loss} = 1 - \frac{\text{recovered}}{\text{injected}} \times 100$$

If the loss rate of the reference sample being tested is greater than 20%, contact COCET, which will assess the reliability of the result and determine whether an additional test is necessary.

Calculation of the separation rate

The separation rate is calculated using the following formula:

$$\% \text{ separation} = \frac{\text{separated}}{\text{recovered}}$$

B. Success criteria

To confirm that the separation of packaging components during collection and transport with compaction is **Acceptable**, it is necessary to verify that:

$$\% \text{ separation} \geq 90\%$$

In this case, it is assumed that the components are systematically separated during the collection and transport stages through compaction.

Otherwise, the separation rate of packaging components during the collection and transport stage using compaction is **Unacceptable**. Packaging components are not consistently separated.

VIII. Test Report

The Requester will prepare a report for COCET that includes all the documentation and an analysis of the data.

To facilitate understanding of the results, the Requester shall prepare a test report specifying the following:

The report should include the following statements:

- « Tests have been conducted in accordance with the COCET Compact I protocol»
- « This report does not, in itself, constitute a COCET notice or a notice regarding the sorting of the tested packaging »

Samples tested:

- A description of the samples received and tested (including photographs)

If several batches of samples have been tested, the descriptions and results for each batch of samples must be presented separately in the report.

Conducting the tests:

- Third-party testing organization: identity documented
- Test date
- Test locations (municipality + streets where samples were disposed off, unloading site)
- The number of samples submitted (with photos) and the operating conditions for each test
- Recording of the samples found for each of the identified categories (with photos)

Analysis of the results:

- The calculations are used to determine the loss rate and separation rate.

The Requester undertakes to adhere to the entire protocol and indicate any deviations from it in the test report with the according reasons.

The test report will be sent to the Requester and will not systematically be the subject of a COCET notice. If the Requester wishes to submit the results to COCET for information, COCET will assess the relevance of issuing a general notice based on the tests conducted.

Annex I: COCET Compaction Test Preparation Form

Company		IMAGE OF THE PACKAGING
First name, last name		
Position		
Email		
Telephone number		

DESCRIPTION OF THE PACKAGING TO BE TESTED

Packaging type	
Trade name/Reference number	
Description of the main body (shape, dimensions, composition)	
Description of each associated component (shape, dimensions, composition)	
Volume marketed	

INFORMATION ABOUT THE MUNICIPAL AUTHORITY AND THE SORTING CENTER

Municipal authority	
Contact	
Function	
Email	
Telephone number	
Sorting center	
Address	
Contact	
Email	
Telephone number	

REQUESTER'S UNDERTAKINGS

☐ I HEREBY CONFIRM THE FOLLOWING

- I wish to conduct tests in accordance with the standard protocol set out by COCET
- I agree to cover all testing costs directly with the third parties involved in the testing
- I agree that the results will be sent to COCET for information

COMPANY STAMP

Date:

Last name, first name, and
signature: