Committee for Studying the Behaviour of Packaging in Sorting Centres

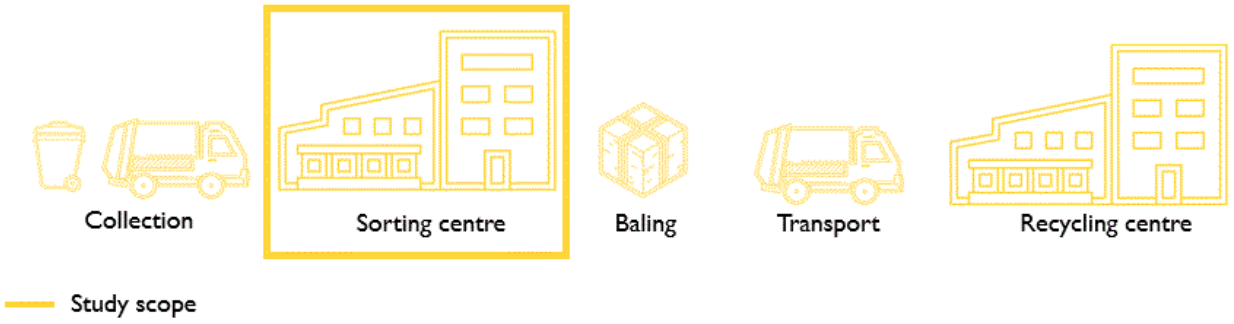
Material
Rigid plastic

GENERAL NOTICE 5

Impact of metallised decorations obtained by vacuum sputtering on the sorting of rigid plastic packaging

SUMMARY

This general notice aims to assess the behaviour in sorting centres of rigid plastic packaging featuring a metallised surface decoration obtained by vacuum sputtering.



In sorting centres, rigid plastic packaging (consisting of more than 50% rigid plastic) is intended to be directed to different recycling streams depending on its resin. Recycling streams are available for the following resins: clear, coloured and opaque PET bottles and dispenser bottles as well as other rigid PP and PE packaging. Recycling streams are under development for clear and coloured PET trays and rigid PS packaging.

The presence on this packaging of a metallised decoration obtained by vacuum sputtering may disrupt its discharging to these recycling streams. COCET checked the impact of these metallised decorations on:

- metal sorting, particularly during capture by an Eddy current machine
- the reading of the infrared signal emitted and received by the optical sorting machine

Rigid plastic packaging with a metallised decoration obtained by vacuum sputtering is not captured by the Eddy current machine during the separation of non-magnetic metals.

Furthermore, the discharge of this packaging during optical sorting is unacceptable.

To ensure that rigid plastic packaging is directed to the target stream, COCET recommends avoiding metallised decorations obtained by vacuum sputtering.

This notice pertains solely to the behaviour of the packaging in sorting centres and provides no indication of the impact of the issue studied during the recycling of this packaging in its target stream.

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1 Context

This notice seeks to assess the impact on sorting of a metallised decoration on the surface of rigid plastic household packaging. The decoration studied in this notice is obtained by vacuum sputtering and involves all metallic-effect colours (gold, silver, etc.).

This technique addresses an aesthetic requirement and creates a surface decoration featuring a "metallic effect".

Sectors concerned with this type of metallised packaging include cosmetics, chocolate, deli products, etc.

COCET carried out optical sorting tests to assess the impact of the presence of decorations obtained by vacuum sputtering on rigid plastic packaging.

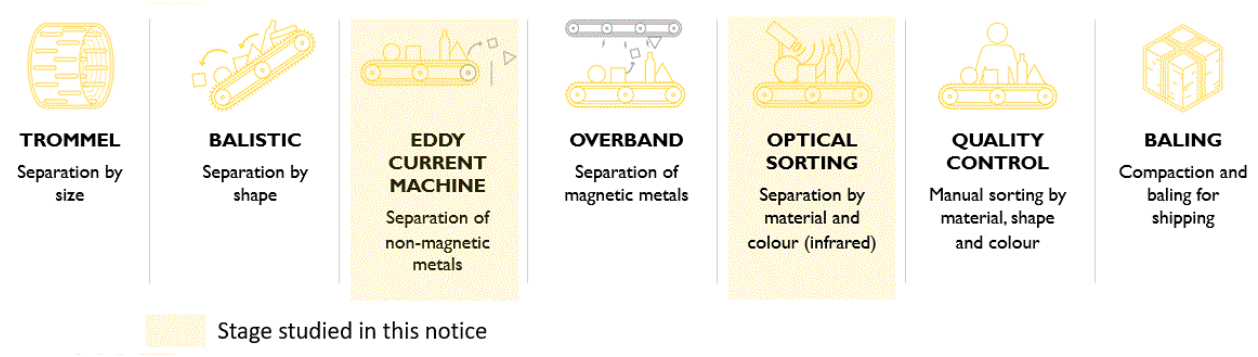
This notice does not concern:

- Rigid plastic packaging with a metallised decoration obtained using other technologies (hot or cold foil stamping, transfer, mass-colouration, etc.)
- Rigid plastic packaging featuring a metallised decoration sandwiched between two layers of plastic (e.g. metallised lamination)
- Flexible plastic packaging

2 Scope of the notice

This notice concerns the discharge of rigid plastic packaging with a metallised surface decoration in sorting centres. It does not assess its suitability for recycling in the target rigid plastic stream.

The identified risks of disruption for packaging with this type of metallised decoration are the separation of non-magnetic metals (by Eddy current machine) and material separation (by optical sorting machine). The study of how this packaging behaves in sorting centres therefore focused on these two stages.



3 Tests performed

Sorting tests were performed to understand how the presence of a metallised decoration obtained by vacuum sputtering on rigid plastic packaging would affect its discharge during the sorting process.

A metallised decoration obtained by vacuum sputtering covers the entire surface of the side in question.

3.1 Separation of non-magnetic metals

This packaging has not been tested in sorting centres. However, COCET experts and feedback from sorting centres indicate that the low metal content of this packaging prevents it from being routed to the aluminium recycling stream.

A metallised decoration obtained by vacuum sputtering does not result in the packaging being routed to the aluminium recycling stream.

3.2 Optical sorting

Static optical sorting tests were conducted at optical sorting machine manufacturers to assess the impact of these decorations on the detection and discharge of the packaging at this stage.

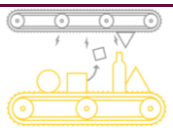
The surface covered by vacuum sputtering disrupts optical reading. The metallised decoration acts as a barrier, preventing the infrared beam from reaching the underlying plastic layer.

A metallised decoration obtained by vacuum sputtering prevents the side covered by this decoration from being read. The discharge of this packaging towards its target recycling stream is unacceptable.

Assessing the behaviour of the packaging tested during optical sorting (OS)

Parameter studied	Discharge rate during OS	COCET's assessment
Metallised decoration obtained by vacuum sputtering	Lower than 80%	**Unacceptable**

Impact during sorting stages

Sorting stage	Impact	Description
TROMMEL	∅	
BASLISTIC	∅	
 EDDY CURRENT	✓	No capture by the ECM[1].
 OVERBAND	∅	
OPTICAL SORTING	⚠	Disruption of optical sorting: the discharge of the packaging towards its target recycling stream is unacceptable.
QUALITY CONTROL	∅	
BALING	∅	

✓ No impact ⚠ Caution ∅ Not tested or not concerned

CONCLUSION

Given the current state of equipment and sorting techniques available in France, a metallised decoration obtained by vacuum sputtering **prevents** the reading of the side(s) covered by these decorations. The discharge of this rigid plastic packaging towards its target recycling stream **is unacceptable**.

COCET may review this notice considering developments in sorting technologies, markets or quality requirements for recycled material.

[1] Eddy current machine