



GENERAL NOTICE 7

Impact of a metallic effect obtained by mass-colouration 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 metallic effect obtained by mass-colouration.



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 of a metallic effect obtained by mass-colouration on this packaging may disrupt its routing 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 metallic effect obtained by mass-colouration is not captured by the Eddy current machine during the separation of non-magnetic metals.

Furthermore, the routing of this packaging by optical sorting depends on the detectability of the colorant.

To ensure that rigid plastic packaging with a metallic effect obtained by mass-colouration is directed to the appropriate stream, COCET recommends using colorants that are detectable by optical sorting.

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 respective stream.

I Context

This notice seeks to assess the impact on sorting of a metallic effect on rigid plastic household packaging. It concerns packaging featuring a decoration obtained by mass-colouration, including all metallic-effect colours (gold, silver, etc.).

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

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

COCET carried out optical sorting tests to assess the impact of the presence of this metallic effect on rigid plastic packaging.

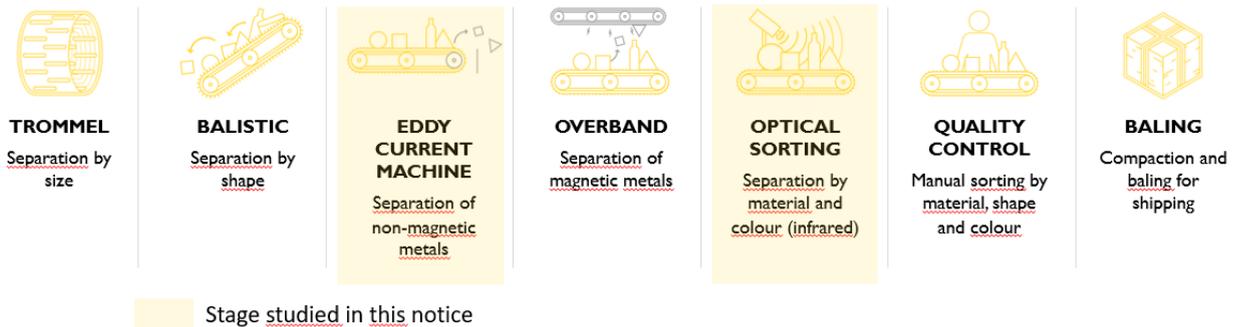
This notice does not concern:

- Rigid plastic packaging with a metallic effect obtained using other technologies (foil stamping, transfer, vacuum sputtering, metallic inks, etc.)
- Rigid plastic packaging with a metallic effect sandwiched between two layers of plastic (e.g. metallised lamination)
- Flexible plastic packaging

2 Scope of the notice

This notice concerns the routing of rigid plastic packaging with a metallic effect in sorting centres. It does not assess its suitability for recycling in the appropriate rigid plastic stream.

The identified risks of disruption for packaging with this type of metallic effect 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 metallic effect obtained by mass-colouration on rigid plastic packaging would affect its routing during the sorting process.

The metallic effect obtained by mass-colouration is present throughout the rigid plastic packaging.

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 metallic effect obtained by mass-colouration 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 routing of the packaging at this stage.

Depending on the composition of the colorants, the mass-coloured rigid plastic packaging is either:

- Not detected: the nature of the colorant prevents the optical sorting machine from reading the material properly. In this case, we refer to a colorant that is undetectable by optical sorting. The routing of this packaging during the sorting process is unacceptable.
- Detected: the nature of the colorant enables the optical sorting machine to read the material properly. In this case, we refer to a colorant that is detectable by optical sorting. If the packaging contains no other sorting disruptors, it will be routed to its designated recycling stream. The routing of this packaging during the sorting process is acceptable.

Dynamic tests were not performed on this packaging. However, if the colorant is detectable and the packaging contains no other sorting disruptors, it can be routed to its recycling stream.

A metallic effect obtained by mass-colouration using a detectable colorant enables the proper routing of rigid plastic packaging to its designated recycling stream.

Conversely, a metallic effect obtained by mass-colouration using an undetectable colorant does not enable proper routing of rigid plastic packaging to its designated recycling stream.

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

Parameter studied	Routing rate during OS	COCET's assessment
Detectable colorant	Over 80%	Acceptable
Undetectable colorant	Lower than 80%	Unacceptable

Impact during sorting stages

Sorting stage	Impact	Description
 TROMMEL	∅	
 BASLISTIC	∅	
 EDDY CURRENT	✓	No capture by the ECMs ¹ .
 OVERBAND	∅	
 OPTICAL SORTING	⚠	If the colorant is undetectable: disruption of optical reading. The routing of the packaging towards its respective 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 metallic effect obtained by mass-colouration may disrupt the sorting process. Detectability of the colorant by the optical sorting machine is essential to ensure the proper sorting of this rigid plastic packaging into its designated recycling stream.

- The use of an undetectable colorant **prevents** the side covered by this decoration from being read. The routing of this plastic packaging towards its respective recycling stream **is unacceptable**.
- The use of a detectable colorant **allows** the side covered by this decoration to be read. The routing of this plastic packaging towards its respective recycling stream **is acceptable**.

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

¹ Eddy current machines