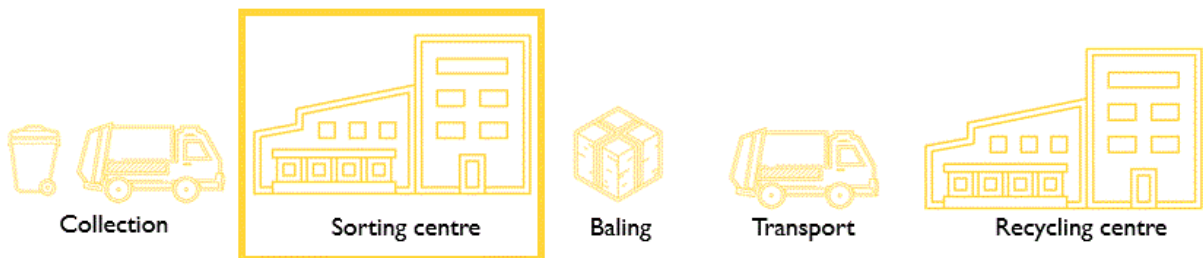


GENERAL NOTICE 6

Impact of metallised decorations obtained using metallic inks 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 decoration obtained using metallic inks.



— Study scope

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 metallised decoration obtained using metallic inks on this packaging 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 using metallic inks is not captured by the Eddy current machine during the separation of non-magnetic metals.

Furthermore, the discharge of this packaging by optical sorting:

- **Is acceptable if the decoration covers up to 50% of the packaging surface**
- **Is unacceptable if the decoration covers over 50% of the packaging surface**

To ensure that rigid plastic packaging with a metallised decoration obtained using metallic inks is directed to the target stream, COCET recommends not exceeding a coverage rate of 50% for this type of decoration.

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.

I Context

This notice seeks to assess the impact on sorting of a metallised decoration on rigid plastic household packaging. It concerns packaging featuring a decoration obtained using metallic inks. This decoration can be applied to the surface of the rigid plastic packaging, either directly or via a label, and includes 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, luxury, chocolate, deli products, etc.

COCET carried out optical sorting tests to assess the impact of the presence of this metallised decoration on the surface of rigid plastic packaging.

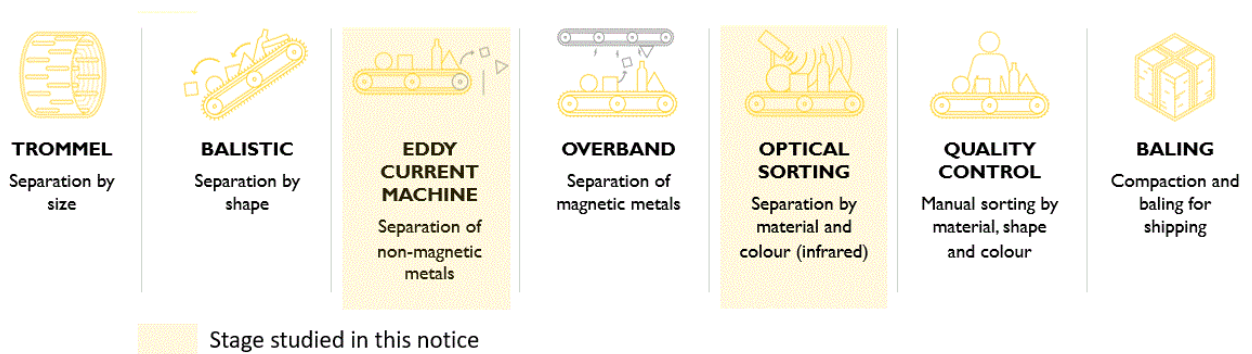
This notice does not concern:

- Rigid plastic packaging with a metallised decoration obtained using other technologies (foil stamping, transfer, vacuum sputtering, 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 using metallic inks on rigid plastic packaging would affect its discharge during the sorting process.

A decoration obtained by metallic inks requires the application of a small amount of metal contained in the pigments. This technique allows the application of partial decorations on rigid plastic surfaces.

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 using metallic inks 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 metallic inks disrupts optical reading: the decoration acts as a barrier by preventing the infrared beam from reaching the underlying rigid plastic layer.

Dynamic tests were not performed on this packaging. However, since the disruption observed in static conditions is similar to that identified for rigid plastic packaging with decorations obtained by foil stamping or transfer (see AG 4), the results of the dynamic tests from that previous study were extrapolated to the case of rigid plastic packaging with a metallised decoration obtained using metallic inks:

- The sorting of rigid plastic packaging with a metallised decoration obtained using metallic inks covering up to 50% of the surface is acceptable.
- The sorting of rigid plastic packaging with a metallised decoration obtained by using metallic inks covering over 50% of the surface is unacceptable.





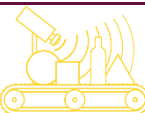


A metallised decoration obtained using metallic inks covering less than 50% of the packaging surface enables acceptable discharge of rigid plastic packaging to its designated recycling stream.

However, if the decoration covers over 50% of the packaging surface, its discharging to its recycling stream is unacceptable.

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

Parameter studied	Discharge rate during OS	COCET's assessment
Coverage rate by metallic inks $\leq 50\%$	Over 80%	Acceptable
Coverage rate by metallic inks $> 50\%$	Lower than 80%	Unacceptable

Impact during sorting stages

Sorting stage	Impact	Description
 TROMMEL	∅	
 BASLISTIC	∅	
 EDDY CURRENT	✓	No capture by the ECM.
 OVERBAND	∅	
 OPTICAL SORTING	⚠	Disruption of optical sorting if the metallised decoration covers over 50% of the packaging.
 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 using metallic inks may disrupt the sorting process. If the decoration covers up to 50% of the packaging surface, sorting remains **acceptable**.

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