Customer Information Note:

Nitrocellulose-based inks and varnishes in recycling: differences between paper and plastic packaging

Nitrocellulose (NC) is an important binder for solvent-based inks and varnishes used in packaging applications. The compatibility of NC-containing inks and varnishes with recycling depends on the packaging substrate and the recycling process used for the corresponding waste stream. Paper and plastic packaging recycling therefore need to be considered separately.

Plastic packaging recycling

The decomposition of NC is a concern in conventional mechanical recycling streams for plastic packaging as it causes gassing during extrusion and reduces recyclate quality by impairing mechanical properties and causing odour issues.

Against this background, the recycling guideline for flexible packaging such as Recyclass© classifies <0.8 wt% NC binder in plastic packaging as having limited compatibility with recycling (= yellow category) for the coloured PE and PP flexible waste streams. At >0.8 wt%, NC binder is classified as not compatible with recycling (= red category).

Paper packaging recycling

Conventional recycling and flotation deinking of fibre-based packaging operate at temperatures far below the decomposition temperature of NC. The thermal decomposition concern described for plastic extrusion therefore does not apply in the same way to these paper recycling processes. NC as a binder is not classified as having limited compatibility or as being non-compatible with recycling for these paper recycling streams.

Conclusion

NC-based inks and varnishes must be assessed in the context of the relevant recycling stream. Concerns and classifications relating to thermal decomposition during plastic recycling should not automatically be extended to conventional paper recycling and flotation deinking.

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