

Umaras

RECYCLASS TECHNOLOGY APPROVAL

Brussels, 01 February 2022

DISCLAIMER

RecyClass recognition applies only to Umaras 'Mildflex' technology reported in Annex I. It, therefore, does not concern to a recyclability assessment of specific packaging using this multilayer technology.

Any specific packaging using this film would need to be tested individually to demonstrate that the system of resin, adjuvants, label, closure, and printing conforms to the RecyClass Recyclability Evaluation Protocol for PE films, and that it is sorted in the PE flexible stream at the state -of-art sorting plants in Europe.

Publication of results of testing of this technology MUST clearly include all the conditions listed in the approval letter. Partial reporting of the conditions is forbidden.

Additionally, any change in the formulation of the technology must be communicated to the Technical Committee which will reassess the approval of the technology.

The RecyClass PO films Technical Committee was requested to carry out an assessment of the technology 'Mildflex' by Umaras to verify its impact on the quality of recycled PE flexible packaging.

The technology is a LLDPE-based multilayer film with barrier properties conferred by a polyamide inner layer. The PA 6/6.6 copolymer (UBE NYLON 5034 FDX40) composing the structure at 20%wt is characterized by a low melting point and a low stiffness. Its compatibility is ensured by 13%wt LLDPE-based tie layers grafted with maleic anhydride (MAH). The film has been tested unprinted.

According to the results that were obtained from the laboratory test by Aimplas, carried out as per the Recyclability Evaluation Protocol for PE films, the 'Mildflex' technology is considered to be **limited compatible with PE flexibles recycling**.

Based on these results, RecyClass certifies that Umaras 'Mildflex' technology will have a limited impact on the current European PE flexibles recycling provided that PE flexible films using this technology are designed only under the following conditions:

- a) The PA used in the film structure is a **PA 6/6.6** copolymer having the following properties¹:
 - a melting point **lower than 192°C**,
 - a tensile modulus around **350-400 MPa**,
 - a tensile elongation at break around **550-650%**;
- b) The PA layer represents at **maximum 20% in weight of the total film structure**;

¹ All tests carried out dry as moulded.

- c) The PA layer is compatibilized with LLDPE-based tie layers grafted MAH (with MAH > 0,06%) and representing at **minimum 13% in weight of the total film structure**;
- d) Applied printing technology is compatible with recycling; since several printing options are possible, it is the responsibility of the end-user to choose an appropriate combination of inks and printing process to ensure that:
 - i. the inks are non-bleeding;
 - ii. the inks comply with the European Legislation (e.g. Packaging and Packaging Waste Directive on the heavy metal concentration levels) and are EUPIA compliant;
 - iii. direct printing is limited as much as possible;

RecyClass concludes that Umaras multilayer structure 'Mildflex' technology as per current market conditions and knowledge, is limited compatible with the existing European industrial recycling processes for PE flexibles. The plastic generated by the recycling process may be used in high quality applications such as PE blown films up to 25%² and providing that full package market penetration is limited to 10% maximum of the whole European LDPE flexible film market.

It should be noteworthy that even if the use of 20% of a specific PA 6/6.6 is presently considered as limited compatible with recycling, the PE amount in the final packaging will be lower than 80%, thus negatively affecting the RecyClass recyclability class and rate of the packaging. Therefore, the RecyClass Technical Committee for PO films recommends to reduce as much as possible the amount of such PA in the multilayer structure to maximize the amount of PE in the film.

About RecyClass

RecyClass is a comprehensive cross-industry initiative that works to advance plastic packaging recyclability and to establish a harmonized approach towards recycled content calculation and traceability in Europe. Activities within RecyClass include the development of Recyclability Evaluation Protocols and scientific testing of innovative materials which serve as the base for the Design for Recycling guidelines and the free online tool. RecyClass offers Recyclability Certifications and Recycled Content Traceability Certification for plastic packaging.

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² Technology tested according to the RecyClass [Recyclability Evaluation Protocol for PE films](#)

Annex I

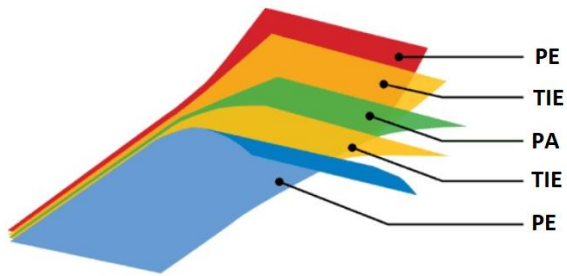


Figure 1 'Mildflex' technology by Umaras used as multilayer structure