

LyondellBasell

RECYCLASS TECHNOLOGY APPROVAL

Brussels, 22 September 2021

Reviewed: Brussels, 19 December 2023

DISCLAIMER

RecyClass recognition applies only to LyondellBasell 'Toppyl PB 8640M' technology reported in Annex I. The recyclability assessment therefore does not refer to the testing of a specific packaging using this 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 'Toppyl PB 8640M' by LyondellBasell to verify its impact on the quality of recycled PE flexible packaging.

The technology is used in a three layers LDPE film with improved peeling properties conferred by the addition of Polybutene-1. The Polybutene-1 (Toppyl PB 8640M) is incorporated in the external LDPE layer and represents 7,5% of the total weight of the film. The film has been tested unprinted.

According to the results that were obtained from the laboratory test performed by Proplast, carried out as per the Recyclability Evaluation Protocol for PE films, the 'Toppyl PB 8640M' technology is considered to be **fully compatible with PE flexibles recycling.**

Based on these results, RecyClass acknowledges that LyondellBasell 'Toppyl PB 8640M' technology will have no negative impact on the current European PE flexibles recycling provided that PE flexible films based on this technology are designed only under the following conditions¹:

- a) The density of the PE film is below 0,97 g/cm³;
- b) The Polybutene-1 (Toppyl PB 8640M) represents 7,5% of the total weight of the film, or less;
- c) Peelable film structures using Toppyl PB 8640M are PE-based, with a prevalence of LDPE;
- d) Any components or attachments to the packaging should be preferably made of clear PE;

¹ PE films designed under conditions other than those indicated need to be tested to assess their compliance with Recyclclass Recyclability Evaluation Protocol for PE films.

- e) Any additional component or features (inks, adhesives, ...) of the packaging must be compliant with the corresponding RecyClass Design for Recycling Guidelines.

RecyClass concludes that LyondellBasell ‘*Toppyl* PB 8640M’ technology as per current market conditions and knowledge, is fully 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.

In regard to RecyClass Recyclability Certification, the present full compatibility with PE flexibles recycling approval delivered to ‘*Toppyl* PB 8640M’ technology, means that a package based on PE film containing the ‘*Toppyl* PB 8640M’ technology, as mentioned in the aforementioned conditions, will not be penalised with a Recyclability Class downgrade. Nevertheless, the amount of recyclable PE will impact the final Recyclability Class obtained during Recyclability Certification and should be kept above 95% or 90% in the final packaging to maximise chances to get a Recyclability Certificate with a Class A or B, respectively³. Also, it is noteworthy that the presence of additional packaging features, like inks or barrier material, could additionally impact the certification process.

About RecyClass

RecyClass is a non-profit, cross-industry initiative advancing recyclability, bringing transparency to the origin of plastic waste and establishing a harmonized approach toward recycled plastic calculation & traceability in Europe. RecyClass develops Recyclability Evaluation Protocols and scientific testing methods for innovative plastic packaging materials which serve as the base for the Design for Recycling Guidelines and the RecyClass Online Tool. RecyClass established Recyclability Certifications for plastic packaging, Recycling Process Certification and Recycled Plastics Traceability Certification for plastic products.

[RecyClass – Plastic Future is Circular](#)

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Contact : Jean-Emile.Potaufeux@plasticsrecyclers.eu

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

³ [RecyClass Recyclability Certification](#)

AMMENDEMENT I:

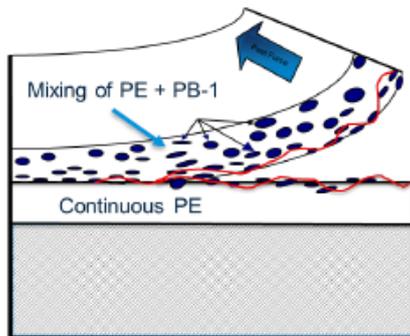
Next to the RecyClass technology approval of the grade ‘*Topyl* PB 8640M’, LyondellBasell developed an equivalent grade ‘*Topyl* PB 8340M’, with the only distinction being the melt flow index (MFI). Packaging applications (*cf.* Annex I), concentrations, and usage in PE-based resins of both grades are the same. The only difference lies in the extrusion technologies, that explain the variation of the MFI. ‘*Topyl* PB 8640M’ is mainly used in blown-film technology, while ‘*Topyl* PB 8340M’ is destined to cast-film and thermoforming technologies.

Based on the information provided by LyondellBasell, the RecyClass PO films Technical Committee extends the present technology approval to the equivalent grade ‘*Topyl* PB 8340M’.

Compounding blends “Ready-to-use solutions” using ‘*Topyl* PB 8640M’ or ‘*Topyl* PB 8340M’ grade under the conditions listed above in the present letter are covered as well by the RecyClass approval as fully compatible with the PE flexible recycling stream.

Annex I

Film sealed to different substrate



Film sealed to 'itself'

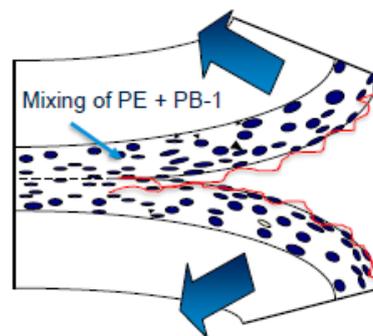


Figure 1 Topyl PB 8640M technology by LyondellBasell used in peelable film structures