RecyClass

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Mitsui Chemicals

RECYCLASS TECHNOLOGY APPROVAL

Brussels, 22 July 2025

DISCLAIMER

RecyClass recognition applies only to Mitsui Chemicals 'TPX™ MX002O' technology reported in Annex I. The recyclability assessment therefore does not refer to the testing of a specific packaging using this material. Any specific packaging using this material 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 PP films, and that it is sorted in the PP 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 'TPX™ MX002O' by Mitsui Chemicals to verify its impact on the quality of recycled PP flexible packaging.

The technology is a poly(4-methyl-1-pentene) copolymer. A blend of 80 wt% of PP resin and 20 wt% of TPX™ MX002O was tested. No other element or decoration were present for the testing.

According to the results that were obtained from the laboratory test performed by the Centre Technique Industriel de la Plasturgie et des Composites (IPC), carried out as per the Recyclability Evaluation Protocol for PP films (version 5.0), the 'TPX™ MX002O' technology is considered to be limited compatible with PP flexibles recycling.

Based on these results, RecyClass acknowledges that Mitsui Chemicals 'TPX™ MX002O' technology will have a limited impact on the current European PP flexibles recycling provided that PP flexible films using this technology are designed only under the following conditions[1]:

a) The density of the PP film is below 0.97 g/cm^3;
b) 'TPX™ MX002O' represents 20 % of the total weight of the packaging, or less;

[1] **PP films designed under conditions other than those indicated need to be tested to assess their compliance with Recyclass Recyclability Evaluation Protocol for PP films.**

c) Any additional component or features (inks, adhesives, …) of the packaging must be compliant with the corresponding RecyClass Design for Recycling Guidelines[2].

RecyClass concludes that Mitsui Chemicals 'TPX™ MX002O' technology as per current market conditions and knowledge, is limited compatible with the existing European industrial recycling processes for PP flexibles. The plastic generated by the recycling process may be used in high quality applications such as PP blown films up to 25 %[3].

In regard to RecyClass Recyclability Certification, the present limited compatibility with PP flexibles recycling delivered to 'TPX™ MX002O' technology, means that a packaging containing this technology, as mentioned in the aforementioned conditions, will be penalised with one recyclability class deduction. Nevertheless, the amount of recyclable PP will impact the final recyclability class obtained during Recyclability Certification and should be kept above 95 % or 80 % in the final packaging to maximise chances to get a Recyclability Certificate with a Class B or C, respectively[4]. Also, it should be noteworthy that the presence of additional packaging features could 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.

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[2] Design for Recycling Guidelines - RecyClass

[3] Technology tested according to the RecyClass Recyclability Evaluation Protocol for PP films

[4] RecyClass Recyclability Certification

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Annex I

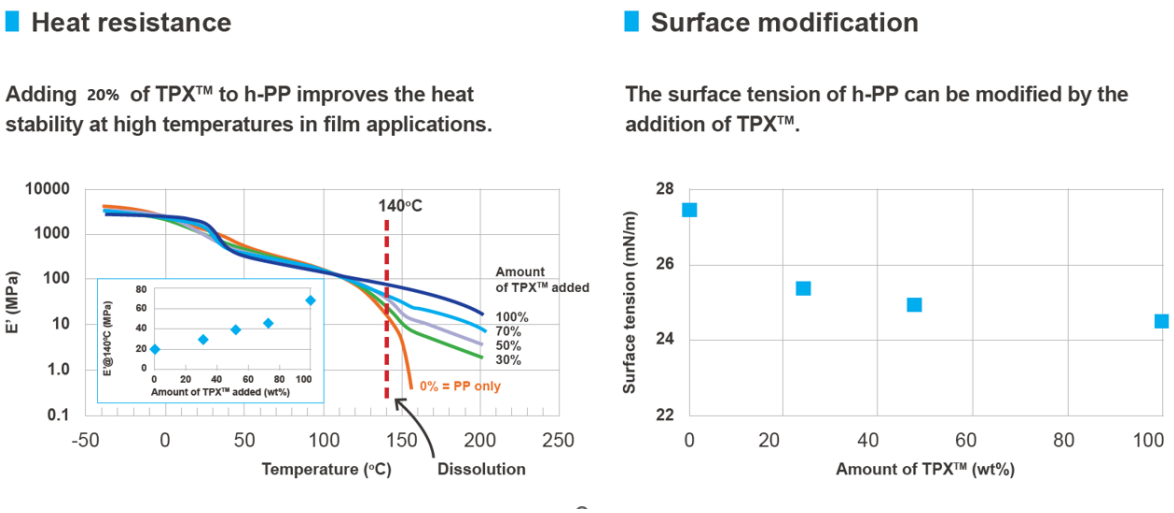

Figure 1. 'TPX™ MX002O' *technology by Mitsui Chemicals.*