



Recycle friendly technologies designed to enable film structures that contain ever higher levels of recyclate resin, functional additives or pigments that are derived from recycled sources and are themselves more easily recycled.

Recycling of multi-layer films is currently limited by poor compatibility between the Polyethylene (PE) and Ethyl Vinyl Alcohol (EVOH) and/or Polyamide (PA, Nylon) barrier layers. As such, much of the multi-material film scrap generated in film extrusion plants is sent to landfills or sold for very little value. Consumers are driving change in the flexible packaging industry towards more sustainable practices and specifically towards circular economy solutions to packaging waste. Compatibilizers have been marketed as solutions to allow the recycling of multi-layer polymer films. However, existing compatibilizer systems have not been able to provide the physical properties nor the economic incentive to allow wide adoption of multi-layer film recycling. Ingenia has developed a solution in the form of a new compatibilizer masterbatch for multi-layer film recycling designated INABLE IP1600. INABLE IP1600 addresses the performance and economic requirements of film producers. Through a multi-variable design study, the effects of thermodynamics (interfacial tension), kinetics (viscosity), along with chemical and processing conditions, have been optimized to allow film recycling with minimal gel formation and with mechanical properties on par or better than the base PE used.

IP1600 Compatibilizer - Ingenia INABLE IP1600 is a functional compatibilizer specifically designed for recycling of EVOH and/or Nylon – polyethylene multi-layer film. With the addition of INABLE IP1600, film from edge trim, start-up and process interruptions can be recycled into a core PE layer of multi-layer, multi-material films.

Suggested Use: Add the IP1600 during repelletizing of EVOH or Nylon containing multi-layer film or directly during film production. A 1:1 loading of IP1600 to the EVOH and/or Nylon content of the film regrind is suggested as the starting point. Users may find a 1:2 ratio will provide sufficient optical and mechanical properties. It is best to discuss your specific application with a member of Ingenia Technical Services, for a recommendation for trial.

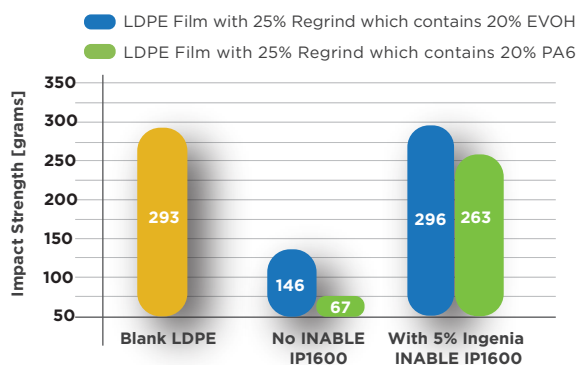


Figure 1. Impact properties of LDPE/multi-layer PA6 and EVOH regrind film with and without INABLE IP1600

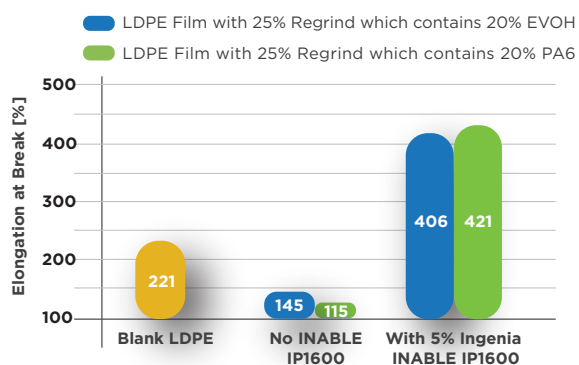


Figure 2. Tensile properties of LDPE/multi-layer PA6 and EVOH regrind film with and without INABLE IP1600

Ingenia INABLE IP1600 could also be used to develop recycle ready films with IP1600 being added as one of the layers of the film structure. This allows compatibilization to happen during recycling of postconsumer film. Providing improved sustainability/marketability of multi-material films to brand owners can set your film apart from the competition! By providing the Sustainable Packaging Coalition with specific application data, there is potential to gain approval for use of the HowToRecycle label for PE films store drop off collection, on your customer's product packaging. Ingenia can partner with you to generate the required data and allow you to improve your support of brand owners in their sustainability efforts.

Please contact us if you would like to receive sample, further information, including detailed studies, TDS, SDS and regulatory information.

Tel: 1 800 991 9000 X1012

Email: Mike.Medlar@IngeniaPolymers.com

Website: www.ingeniapolymers.com

About Ingenia

With a passion for excellence, a relentless drive for innovation and an entrepreneurial spirit that's unmatched in the industry, Ingenia Polymers is one of the most trusted providers to the worldwide thermoplastics industry today, and the preferred supplier to some of the most trusted household brands.

As the premier integrated solutions provider for the global polymers industry, we have the people, the technology and the expertise to service a variety of markets. Every day our customers trust Ingenia to handle their most demanding applications.

Today, Ingenia Polymers is composed of two complementary business units. Our Primary Producer Division provides thermoplastic custom compounding, size reduction, custom densified additive blend solutions and product development support for resin producers. Our Proprietary Products Division provides a full array of engineered products such as white and black Masterbatches, additive and color concentrates as well as specialty products that serve the film, pipe and rotomolding market segments. With innovation and customer partnerships at the forefront, Ingenia Polymers is supporting our customers' drive to succeed in their support of the Circular Economy for Plastics and to reach their Sustainability goals. Through our technical and analytical capabilities, we develop custom solutions to support our flexible packaging customers, while maintaining stock of industry standard products for immediate response to customer needs. Together each division works to add value to our customers' supply chains around the world. To learn more visit our website at: www.ingeniapolymers.com.



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