



# Recyclability of Co-extruded films

## PRODUCT APPLICATION NOTE

**Pluss Advanced Technologies Pvt. Ltd.**

B-205, Tower B – Pioneer Urban Square, Sec 62, Gurugram-122101, Haryana, India

Telephone: +91 - 124 - 4309490/91/92

E-mail: [info@pluss.co.in](mailto:info@pluss.co.in) | Web: [www.pluss.co.in](http://www.pluss.co.in)

## Recyclability of Co-extruded films

### Utility of Multi-Layer Plastics Films

In its dual role as an attractive container for products, as well as preserve the contents until use, packaging films are supposed to have adequate mechanical and barrier properties to retain product integrity as well as shelf life during transit and storage. From performance and cost considerations, use of different materials in multilayer structures provide cost effective performance in terms of mechanical strength, seal integrity & strength; barrier to moisture, oxygen, odour etc.; as well as printability and runnability on FFS machine, and so on.

### Importance of Co-extruded films

Multilayer film structures made by Co-extrusion provide excellent opportunities in packaging applications in most efficient and cost-effective manner. Co-extrusion process allows use of minimum quantities of plastics materials in a film structure to give optimum combination of performance properties. Besides commercial benefits, this approach helps curtail overall consumption of plastics and goes a long way in protecting our environment.

### Issues with recycling of Multilayer Coextruded films

Presence of plastics with different chemistry and processability in the same structure however poses its challenges in reprocessing. Coextruded multilayer barrier films comprising of nylon and polymers of olefin family are not as easy to reprocess as those of a single polymer type like polyethylenes or polypropylenes. Not only do the diverse materials have different melting temperatures, they are inherently incompatible in melt and solid states.

### Designed-in recyclability of co-extruded barrier films

The need for conserving scarce petroleum products and to prevent environmental pollution is not lost on anybody in today's world. Recyclability of anything that stands discarded after use cannot be overlooked and left to take care of by unorganised setups. As matter of fact, time has come to think of building-in recyclability in design of any packaging material.

**Pluss has done exactly this** in designing a tie layer resin for coextruded films, which will also render the multi-layered structure recyclable. Pluss **reCoupp® E-832** provides excellent interlayer adhesion between nylon and PE or PP layers in a coextruded multilayer structure.

At the same time it contains adequate reactive groups to homogenize nylon with PE or PP in melt state and stabilise the alloy in solid state. This polymer alloy behaves as a single uniform material in further processing and use. This material can further be blown into films or moulded into various products using conventional injection or extrusion moulding.

For detailed properties and specifications, please refer to technical data sheets.

### **Guidelines for use**

reCoupp® E-832 is recommended to be used in-tie layer composition after 60% dilution with film grade polyethylene; however, actual concentration depends on the end use application of the reprocessed material. Tie layer thickness in each case will depend on the nylon content in the multilayer film. Around 16µm of total tie layer thickness is recommended for 9 – 10µm Nylon layer in a 100µm barrier film.

### **How is recyclability assured?**

Rejections of the coextruded multilayer films can be shredded, agglomerated and converted into composite granules via extrusion process without adding any compatibilizer. At reprocessing temperatures in the extruder, the functional groups in reCoupp® specialty tie layer resins act by compatibilising nylon with polyolefin content of multilayer structure, yielding an alloy of uniform properties. The material so produced exceeds the guidelines of IS 14534: 2016 for recovery and recycling of plastics waste.

---

The information given here is meant as a guide to determining suitability of our products for the stated applications. It is based on trials carried out by our laboratories and data selected from literature and shall in no event be held to constitute or imply any warranty. The products are intended for use in industrial applications. The users should test the materials before use and satisfy themselves with regard to contents and suitability in the desired application. Our formal specifications define the limits of our commitment. Recommendation herein may not be construed as freedom to infringe/operate under any third party patents. In the event of a proven claim, our liability is limited only to replacement of our material and in no case shall we be liable for special, incidental or consequential damages arising out of usage of our material. This datasheet is subject to change without notice.