

PLUSS®



Pluss Polymers is an offshoot of Manas, established to develop and market new technologies and products developed inhouse. Pluss Polymers was incorporated in 1993 to commercialise the technology for grafted modified polymers and alloys and blends. Backed by competent technical staff, laboratory facilities, a good library and technical database with a retrievable wealth of information marketed the OPTIM® brand of grafted polymers for the first time in India in 1996.

OPTIM® coupling agents and compatibilisers allow plastics manufacturers of world class quality products to *OPTIMise* their compound properties. The ADNYL® range of nylon alloys provide the user with extra tough nylon for increased strength.

Profiles and other rigid and flexible containers for thermal energy storage have also been introduced in India for the first time by Pluss Polymers.

TECHNICAL DATA SHEET

Product	: OPTIM® E -119
Series	: 100
Description	: Grafted LLDPE resins with anhydride and acid functionality.
Appearance	: White to off white free flowing pellets / granules.

Properties OPTIM® E-119

Density g/ml	0.923
T _m (DSC) °C	108.0
MFI-190°C, 2.16 Kg	1.5
MAH Content (% min)	High
High: 0.9-1.5%	

Applications

Wire and Cables

OPTIM® E-119 can be used as coupling agents for non-halogen flame retardant wire & cable compounds containing fillers such as Aluminium Tri Hydrate (ATH) or Magnesium Hydroxide (Mg(OH)₂). It allows higher loading of fillers in PE or PE/EVA blends. Typically 2-4% (or less) of OPTIM® E-119 is recommended depending upon the filler content.

Coextrudable Adhesive

OPTIM® E-119 can be used for lamination on aluminium foil and cable wrap and similar applications. It has excellent adhesion to aluminium foil and good heat seal characteristics, which can be used to advantage in processing and application. These OPTIM® grades are designed as coextrudable adhesive between nylon and LDPE and other similar polymers, particularly in multilayer film applications.

Nylon Alloys

OPTIM® E-119 are based on LLDPE, having acid and anhydride groups grafted on the back bone. Although polyethylene on its own will not blend with nylon but the anhydride groups react with the amine end groups in nylon and thus compatibilise polyethylene moiety, as shown in figure.

Such nylon alloys have excellent impact properties even at low temperatures. The additional ester groups facilitate wetting of glass fibres for improved dispersion and impact properties in glass filled nylon alloys.

Properties of Alloy/formed are determined by a number of factors. Some of the important ones are:

1. Shear rate
2. Residence time
3. Temperatures
4. Grade of Nylon
5. Composition and
6. Additives package

In-situ Nylon Alloying

These OPTIM® E-119 can be hopper blended with nylon and moulded into small or large components using screw type injection moulding machine providing adequate mixing. At the nylon processing temperatures, an alloy is formed in injection moulding machine itself, having good impact properties.

Processing Conditions

The coupling reaction provided by series 100 resins are slow at 200°C and estimated to be over in less than 2 min. at 240°C. Thus, for any application, the normal resin residence time in an extruder system or a compounding equipment is adequate for the said reaction and the resultant coupling to occur. Maximum processing temperature should not exceed 280°C.

Drying: Series 100 resins are mildly hygroscopic. Our recommendation is that prior to processing the material should be dried in a hopper dryer or oven at 80±5° C for 2 to 4 hours.

Stoppages: For short interruptions, the extruder should be kept running at a low speed (as low as practical).

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