

# PLUSS<sup>®</sup>



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<sup>®</sup> brand of grafted polymers for the first time in India in 1996.

OPTIM<sup>®</sup> coupling agents and compatibilisers allow plastics manufacturers of world class quality products to *OPTIMise* their compound properties. The ADNYL<sup>®</sup> 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® B-520, B-523, B-524**  
Series : 500  
Description : Series 500 materials are Ethylene Vinyl Acetate co polymer grafted with additional anhydride and acid functionality.  
Apperance : Off white to light yellow free flowing pellets / granules

Properties	B-520	B-523	B-524
MFI-190°C, 2.16 Kg	3.0	4.0	3.5
MAH content % (min)	0.9-1.3	0.5-0.8	0.5-0.8

### Applications

**OPTIM® B- 524** is suitable for film application as heat seal layer or as a tie layer between non-compatible film layers. These can also be used for extrusion coating on plastics films or aluminium foil in packaging and cable wrap applications. Powdered **OPTIM® B-520** imparts good adhesion to textiles in interlining applications, and is also used for commingled plastics waste recycling. In **OPTIM® B-520**, grafting of the base copolymers is so controlled as to give higher viscosity of the product (nylon alloy) at the same use level as **OPTIM® B-524**.

### Nylon Alloys - In-situ and Compounded

**OPTIM® B-520** and **B-524** are specifically recommended for this application. These 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. The presence of additional ester groups ensures good blending during shorter residence time in injection moulding machine as compared to a compounding machine. Thermal stability is limited to the stability levels of EVA.

### Coextruded Films

**OPTIM® B-524** have characteristics suitable for producing blown and cast films. The acid, ester and anhydride functional groups impart good adhesion of these grades to film layers of dissimilar materials. In molten condition, they adhere well to polyolefines, like LLDPE, HDPE and PP paper and textiles, as well as nylon and aluminium foil. In coextruded films, **OPTIM® B-520** and **524** can be used as tie layers to enhance inter layer adhesion in multi

layer structures. Their low heat seal temperature with good heat seal strength and hot tack strength make them a good choice for coextruded film including oriented or non oriented blown films used in packaging.

### As Compatibiliser in waste Recycling

**OPTIM® B-520** finds use in compatibilising blends of dissimilar plastics like polyester and polyolefins. One of the major applications of such compatibilization is in commingled PET/PE film waste recycling.

### Extrusion Coating

The excellent adhesion and heat seal properties of **OPTIM® B-520** and **B-524** can also be advantageously used by extrusion coating on plastics films, paper or aluminium foil. In cable wrap application, **OPTIM® B-520** can be used by extrusion coating or by thermal lamination of blown film containing **B-524** to aluminum foil.

### Interlining and Labeling

Being softer than LDPE, pulverisation under cryogenic conditions is recommended for producing **OPTIM® B-520** powder for interlining and labeling applications. This powder provides much higher seal strength than LDPE, due to the presence of a high percentage of polar groups.

### Process Conditions

#### Drying

**OPTIM® B-520** and **B-524** are mildly hygroscopic. It is recommended is that prior to processing, the material should be dried in a hopper dryer or oven at 70±5°C for 2 hrs.

#### Extrusion Parameters

Extrusion parameters depend upon the equipment used and the application requirements. Melt temperature should not exceed 230°C to prevent degradation.

#### Stoppages

Stoppages can lead to degradation as characteristic of EVA copolymers. For short interruptions, the extruder should be kept running at a low speed (as low as practical).

## Pluss Polymers Pvt. Ltd.

610 A, Udyog Vihar, Phase V, Gurgaon -122016 Haryana (India.)  
Tel: +91 124 4309490 / 91 / 92, Fax: +91 124 4309493, Email: info@pluss.co.in, Website: www.pluss.co.in

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