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. Novis™ is a range of high and ultra high melt flow rate homopolymer for thin part injection moulding and nonwoven melt blown applications.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	:	**Novis™ P-400, P-440, P-490**
Series	:	400
Description	:	Isotactic low molecular weight polypropylene with enhanced flow properties.

Properties	**P- 440**	**P- 400**	**P- 490**
Density g/ml	0.88	0.88	0.86
Melting Point (°C)	160	160	160
MFI-230°C, 2.16Kg	200	900	1650

Novis™ P-400 series polymers have a melting point and mechanical properties quite close to conventional PP, but its low molecular weight and narrow MW distribution produces a very high melt flow rate. In addition, the melt viscosity is unchanged at different shear rates, unlike conventional PP, which is shear sensitive. Nonetheless, Novis™ P-440,P-400, P-490 are completely miscible with conventional PP resins. This combination of properties is responsible for its multifunctional role as a very useful processing aid.

Applications

Novis™ P-400 series polymers find its application as an efficient flow aid for conventional PP and PP based compounds, and as a colour concentrate vehicle for PP.

1. PP Blends : Homologous miscible blends can be produced by mixing Novis™ P-400 or P-440 and PP. These blends have increased melt flow while maintaining the strength and modulus of end products.

Combining PP with Novis™ 400 series results in appearance of two peaks in the molecular weight distribution (MWD) curve, thereby imparting a "bimodal" character to the blend. This has an effect equivalent to broadening of the MWD, which leads to improved processability of these blends. The high molecular weight, in its turn, improves the mechanical properties. This unique phenomenon is particularly useful in blending very low MFI PP with Novis™ P-400 or P-440, to improve processability. Such blends also have melt strength higher than that of reactor-produced, unimodal PP of the same nominal MFI. This special characteristic could be advantageously used in blow moulding, thermoforming, profile extrusion and extrusion-coating.

2. Filled PP Compounds : Combination of high flow rate with zero detrimental effect on conventional PP's mechanical properties makes Novis™ P-400 and P-440 very useful as a concentrate vehicle or dispersion aid for allowing high loadings of pigments or fillers such as talc, calcium carbonate and wood flour. These filled PP compounds find wide application, particularly in injection-moulded furniture, appliance bodies and the like.

3. Processing Aid in PP Injection Moulding :
Novis™ P-400 series help increase effective MFI of the material when added (hopper blended) to virgin or filled PP. This increases output and reduces part rejection due to short moulding, distortion or warpage. It also facilitates thin wall mouldings. The bimodal characteristic of the material and the enhanced flow propert- y allows mould filling at reduced injection pressure and this in turn results in stress-free moulding.

4. Melt Blown Non Woven Applications:
Novis™ P-490 is a ultra high melt flow rate homopolymer. This grade is recommended for melt blown nonwoven applications. Polymers used in melt blown process must have a low viscosity at a relatively high temperature.
Novis™ P-490 decreases the overall viscosity of the material and facilitates the smooth formation of microfibers coming out from the die holes. It also helps in producing microfibers of the diameter in the range of 0.1 to 4 μm through which one can vary degree of softness, opacity & porosity.

Processing Conditions
Normally, Novis™ P-400 series are not processed on its own but is used as an additive in polymer processing and compounding. The known processing parameters of the base polymers serve as a basic guideline, but the actual processing conditions vary according to the chosen addition levels of Novis™ . Novis™ P-400 series are non-hygroscopic like conventional PP. Pre- heating is not required under normal usage conditions. For all practical purposes, thermal stability of Novis™ P-400 series is of the same order as that of conventional PP.

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