

DATA SHEET

Low RI Optical Laminating Adhesive: PS-133

PS-133 is a low refractive index pressure sensitive adhesive. It is supplied as a 35% resin in a volatile solvent (Novec 7500, hydro-fluoro-ether from 3M). Its properties, as listed in the table below, relate to the state after the solvent has been evaporated. The product is also available as a 100% solids hot melt adhesive named **PS-133-100**.

The refractive index of 1.33 makes it valuable for bonding (lamination) of light guiding layers in various optical devices. A typical application is to laminate PET or PMMA layers onto other substrates.

The product is an inert polymer with a very low surface energy, yet, it sticks to most surfaces. It is highly hydrophobic and inert. It will not interact with aqueous media.

PS-133 is useful in the construction of display backlights (BLU) and other flat light guide devices. Its major advantages over the low RI UV and moisture cured adhesives are:

1. Better adhesion.
2. Adhesion is not degraded by vibrations or thermal cycles. It has a self healing quality.
3. No need for a curing process.

Properties

The product is inherently tacky and will not harden with time. It has a very low Tg.

The pressure sensitive properties or "tack" are permanent and long lasting. The material is stable to environmental conditions (oxygen, UV, humidity, heat etc).

The material is heat stable to at least 150°, however, it is intended to be used at temperatures up to 100°C.

Table: Properties of the final coating

Refractive index@589nm	1.330
Density	1.66
Appearance	Highly viscous, Non flowing, Clear, Colorless
Viscosity	40000-80000 cps at 100°C
180° Peel Force	150 gram/cm @ 50 cm/min. (PET/PET, 10 micron thick adhesive, at 25°)

Application

PS-133 can be applied by conventional coating technologies. It is supplied as 35% solids at a viscosity of about 1000 cps and can be further diluted to achieve thinner coatings.

The solvent has to be evaporated before bonding (by pressure) takes place.

Alternatively, it can be applied with a hot melt coating equipment (at about 120-180°C).

Adhesive thickness depends on the lamination process and the specific application. It can be in the range of 3 to 15 microns or more.

Note: For experimentation, lamination can be done on an office laminating machine at about 30-100°C.

Cleaning and solubility

The best solvents for diluting the product (solvents that are capable to make clear solutions even at low solid concentrations) are fluorinated solvents such as Freon 225 (Asahi AK-225, AE-3000), HFE-7100, 7200, 7300(3M), Vertrel (DuPont) and other CFC and HFC substitutes for Freon. Good solubility is also achieved in mixed fluoro and other conventional solvents. A mixture such as 1/1 by weight acetone / HFE-7100 is suitable for diluting and removing the product.

Safety

The product is a polymer and relatively safe. Care should be taken of the solvents involved. Please refer to the specific MSDS.

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