

PS-133

Optical Laminating Adhesive

September 2009



PS-133 is a low refractive index pressure sensitive adhesive.

The refractive index of 1.33 makes it valuable for lamination of light guiding layers in various optical devices.

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.

Properties

Refractive index@589nm	1.334
Density	1.666
Appearance	Highly viscous, Non flowing, Clear, Colorless
Viscosity	20000-40000 cps at 100°C
180° Peel Force	550 gram/inch @ 20 inch/min. (PET/PET, 50 micron thick adhesive, at 25°)

The product is available as a 100% solids or diluted in organic solvents.

Application

PS-133 can be applied by conventional coating technologies. It can be supplied diluted to 50% or over in a number of solvents.

Alternatively, it can be applied with a hot melt coating equipment.

Typical application is to laminate PET or PMMA layers onto other substrates. The product has a very low Tg and is none crystalline. It is inherently tacky and will not harden with time.

Cleaning and solubility

The product can be removed with solvents such as acetone. Acetone and many other medium polarity solvents (esters, ketones) dissolve the material only at high concentration, typically above 25% solids. The only true 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 KS-225), HFE-7100 (3M), Vertrel (DuPont) and other CFC and HFC substitutes for Freon. Good solubility is also achieved in mixed fluoro and conventional solvents.

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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Optical Laminating Adhesive: PS-133

Application Notes

PS-133 is useful as a light guide tool in a design of display panels and other flat light guide devices. Its major advantage over the UV and moisture cured systems are:

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

PS-133 can be supplied 100% solids. It is a highly viscous resin that can be coated with the aid of a hot-melt application equipment. It needs to be applied at above 100-120°C.

On a small scale it can also be applied as 35% solids solution in a volatile solvent such as HFE-7100 (3M) and be coated by a regular doctor knife or any other coating device. Final lamination can be done on an office laminating machine at about 80-100°C.

Typically a weight of 20-100 gram/m² is useful for a lamination.

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, since it liquefies at elevated temperature, it is not intended to be used at temperature above 70-80°.

In another version, PS-133 is used as a **primer** (see: **Primer PS**) for the MY-133 UV curable series. It has a matching refractive index to that of the MY-133 UV adhesive and it creates a "liquid" layer that prevents the delamination of the UV adhesive from the substrate as a result of mechanical or thermal shocks or as a result of humidity and heat. Unlike the other primers which are offered for MY-133, this one is the most versatile. It suits all types of substrates and it has no timing limitations or sensitivity to either light, moisture oxygen and the like. For a primer, a coating thickness of 10-20 gram/m² is optimal.



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