

## DATA SHEET

### LOCA-133: Low Index Liquid Optically Clear Adhesive

LOCA-133 is distinguished by its unique combination of high bond strength and low refractive index of 1.33.

The adhesion of LOCA-133 is about 100 times stronger, compared to other optical adhesives with similar index.

LOCA-133 can be used for bonding glass, PMMA, PET, PC, metals and many other materials.

The low index of 1.33 is useful in bonding (lamination) of light guiding layers in the field of electronic displays. Typical applications include: lamination of PET films (reflector, diffuser) onto a PMMA or a glass light-guide; lamination of an optical touch screens to the LCD module, etc.

LOCA-133 is a solvent borne UV cured adhesive. Its properties, as listed in the table below, relate to the cured state. It is a highly hydrophobic material.

#### Properties

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

The tackiness of LOCA-133 is permanent and long lasting.

The material is heat stable to at least 150°C, however, since adhesion decreases with temperature, it is intended to be used at temperatures up to 120°C.

**Table: Properties of the final cured coating**

Refractive index at 589 nm	1.337
Refractive index at 950 nm	1.332
Density	1.66
Appearance	Tacky, Non flowing, Clear, Colorless
Viscosity	2000 CPS
T- Peel Force, PET/PET, g/cm	700 gram/cm @ 10 cm/min. (20 micron thick adhesive, at 25°)
Lap-Shear Strength, PET/PET @23°C	2800 gram/cm <sup>2</sup> (20-30 micron thick adhesive)
Lap-Shear Strength, PET/PET @90°C	600 gram/cm <sup>2</sup> (20-30 micron thick adhesive)
Temperature range	-40°C to 120°C
Shelf life	12 months

#### Application

LOCA-133 can be applied by conventional coating technologies such as screen printing or coating by a rod (See "How to Coat" video at the Technical Support page). It is supplied as a 35% resin in a volatile solvent at a viscosity of about 2000 cps and can be further diluted to achieve thinner coatings.

The solvent has to be evaporated before bonding (by pressure) takes place. Typical drying time, for a 20 micron dry coating is 1 hour at ambient conditions or 2-3 minutes at 70°C. After solvent removal it will stick to almost any surface. Adhesive thickness depends on the lamination process and the specific application. It can be in the range of 3 to 30µ, or thicker.

Lamination should take place after solvent removal. Final strength and final thermal stability of the laminated product shall be achieved after UV curing of the laminated product. The UV curing can be done immediately after lamination or at a later stage. (No need for inert atmosphere during UV curing). A minimum dose of 0.3 J/cm<sup>2</sup> is recommended.

Note: For experimentation, lamination can be done on an office laminating machine at 20-120°C.

#### Cleaning and solubility

Dilution down to 25% solids can be achieved with butyl acetate. Further dilution (below 25%) and clean-up requires a mixture with fluorinated solvents. A 1/1 by volume mixture of butyl-acetate and Novec 7300™ by 3M is a good option. This mixture is also the best for cleaning equipment.

**Note:** HFE-7300 can be replaced by any of the other available fluorinated solvents such as Freon 225 (Asahi AK-225, AE-3000), Novec-7100, Novec-7200, Novec-7500(by 3M), Vertrel (DuPont) and other CFC and HFC substitutes for Freon. The ratio of HFE/butyl-acetate can be varied over the range 40/60 to 96/4 by volume (55/45 to 98/2 by weight). Acetone can be used to substitute for butyl-acetate.

**Safety:** Refer to the SDS

Note: The above information is believed to be reliable, but it is not to be taken as a representation, warrantee or guarantee. Customers should perform their own QC, QA and evaluation tests.

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