



HC-6000

Optically Clear Colloidal Silica Hybrid UV-curable Hard Coat

PRODUCT DESCRIPTION:

- Base chemistry: acrylate resin with colloidal silica nano particles, radical polymerization

- UV-curing

PRODUCT USE:

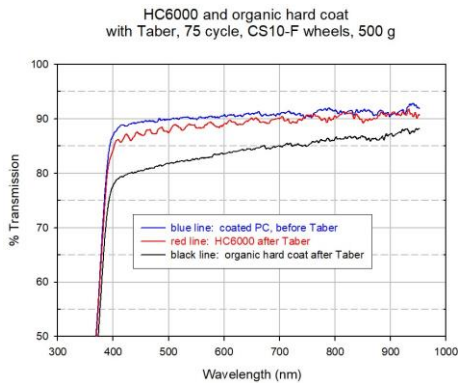
- Hard coating for plastic films
- Binder resin for conductive particles coating

FEATURES:

- High Tg, high hardness, low shrinkage, high abrasion resistance, flexible suitable for small bend radius

HC-6000 contains amorphous colloidal silica for providing three main benefits: low shrinkage, high hardness and high abrasion resistance.

Figure 1 provides Taber abrasion studies of HC-6000 vs organic (no colloidal silica) hard coating. After the Taber test, some scratches were observed for HC-6000 with retained optical properties. Many scratches were observed for organic hard coating resulting in loss of optical properties



GENERAL USAGE INFORMATION:

Shipment: no restriction on shipment

Storage: After receipt in black syringes or amber HDPE bottles, room temperature storage (15-30°C) in the original container is required.

SAFETY AND HANDLING

The uncured hard coat can be cleaned with isopropyl alcohol (IPA), methyl ethyl ketone (MEK), acetone, or xylene. Avoid direct skin and eye contact. Use only in well ventilated areas. Use protective clothing, **gloves and safety goggles**. Read **Safety Data Sheet** before handling.

TYPICAL PROPERTIES of NEAT RESIN

Liquid

Viscosity (cps, 25 °C at shear rate 100/s)	2,000 -3,000
Storage (°C)	15 - 30
Shelf life (15 - 30 °C)	6 months
Pot life(15 - 30 °C)	3 months

Cured film

Shrinkage (volume, %)	4
Hardness – Shore D	90-95
Glass transition temperature (DMA tan delta, °C)	114
Physical properties tested at 25°C, 50% RH (ASTM D638)	
Tensile strength, MPa	11
Elongation (%)	7
Modulus, MPa	2,000

PROCESSING PROCEDURES FOR HC-5950

Dilution ratio: HC-6000 is supplied as a neat resin (no solvent).

- 30 to 50% of HC-6000 is mixed with solvent for processing

Recommended solvent for dilution: propylene glycol monomethyl ether (PM or PGME), n-Butyl Acetate, Methyl Isobutyl Ketone (MIBK), or Methyl Ethyl Ketone (MEK).

Viscosity of 50% of HC-6000 in PM: 5-8 cps at 25 °C

Application note: After solvent is added, the mixture must stand for a short time to allow micro bubbles to disappear prior to coating.

Suitable coating process: roll to roll, dip coat, spray coat or spin coat.

Recommended coating thickness: 6 to 15 µm

Curing conditions:

Pre-curing: 60 – 80 °C for 1 – 2 min, IR heating is acceptable

UV-curing: High, medium pressure Mercury lamp or Fusion lamp

UV dose: 500 – 700 mJ/cm²

Pencil Hardness: 6µm film

TAC film (10-15 µm)	3H
PET film	3H – 4H
PC substrate	4H – 5H
PMMA substrate	4H – 5H

Adhesion to film Excellent

Steel Wool resistance Excellent

To achieve the optimum hardness, a dilution of 40-50% of solid and a UV dose of >500 mJ/cm² are required.

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