



Visgard® 106-94

Abrasion, Chemical and Scratch Resistant Anti-Fog Coating

DESCRIPTION

Visgard® 106-94 is a two part-polyurethane-based thermal cure coating. Provides excellent resistance to fogging, scratching, and chemical attack. Intended for use on polycarbonate, acrylics, nylon, PVC, PETG, and certain other clear plastics without primers.

It can be applied via dip, spin or flow coating techniques.

FEATURES

- Primer-free Adhesion to Polycarbonate
- Abrasion and Chemical Resistance
- Permanent Anti-Fog Properties
- Optical Clarity
- Formable
- Passes EN-166:2001 for:
 - Anti-Fog (N-mark)
 - Falling Sand Abrasion (K-mark)

STORAGE AND USE

The recommended storage temperature for Visgard 106-94 (Parts A and B) is 20-25°C (68-77°F). When stored at this temperature in the original closed container it is recommended to start use of the product within six months from the date received.

Do not use either product if it contains insoluble precipitate.

SOLUTION PROPERTIES

PROPERTY	TYPICAL VALUES	
	Part A	Part B
% Solids	27.0 - 29.0 %	65.5 - 68.5 %
Viscosity @ 25°C	5 - 25 cP	30 - 300 cP
Density @ 25°C	0.9 - 1.0 g/ml	1.0 - 1.1 g/ml
Solvents	Diacetone alcohol, Cyclohexane, N-methyl-2-pyrrolidone, 2-methylbutan-2-ol, Xylene	N-butylacetate, Xylene

CURED COATING PROPERTIES

PROPERTY	TYPICAL VALUES
Coating Thickness	6.0 - 15.0 µm
Refractive Index	1.53
Adhesion	100%
Anti-Fog Performance EN-166:2001 (N-mark)	Pass
Resistance to Surface Damage by Fine Particles EN-166:2001 (K-mark)	Pass
Taber Abrasion (Δ% Haze) 8µm on Polycarbonate 15µm on Polycarbonate	100 revolutions: <8 100 revolutions: <6



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FORMING

Coated articles may be drape formed or heat pressed. However, the coating will crack if elongation exceeds 25% to 30%, and coating properties will be lost in those areas. Visgard tolerates brief exposure to temperatures over 175°C (350°F) and exhibits long term stability at 75°C (170°F).

PACKAGING

Coated parts should not be packaged until the coating has been removed from the oven and cooled for 12 to 24 hrs.

If maskings are applied they must have a very smooth, glossy adhesive surface with peel strength of 0.5 oz./in. (6g/cm) or less. Do not apply masking until the coating has post cured and feels hard to the touch.

For individual coated parts it is recommended to use high density polyethylene (HDPE) bags (>2 mil). The bags should be sealed to exclude moisture. Do not package in an area where humidity is >70%.

Parts coated with Visgard 106-94 should be stored in a cool, dry place. In a humid environment the coating may develop a wipeable haze which can be removed by wiping with a soft dry cloth.

RECOMMENDED OPERATING GUIDELINES

PROPERTY	TYPICAL VALUES
Environmental Conditions	20 - 25°C, 35 - 65 % RH (Class 100)
Air Flow	Filtered, Laminar
Coating Temperature	20 - 25°C
Coating Filtration	5 µm
Extraction Speed	1.0 - 2.0 mm/s
Dry Time/Temperature	10 - 60 s @ 20 - 25°C
Pre-Cure Conditions	10 min @ 60°C
Cure Conditions Polycarbonate Acrylic	1 hr @ 125°C (257°F) 2 hrs @ 80°C (180°F)

PRODUCT MIXING

Mix 10 parts A to 4 parts B, by weight (2.8:1 by volume) and stir until homogeneous. Allow to stand long enough for all bubbles to break. The mixed solution should appear clear with a viscosity of 15-20 cps containing 40% solids. Use this mix for best cured coating performance.

Dilution will extend pot life and improve flow properties however may result in reduced anti-scratch performance.

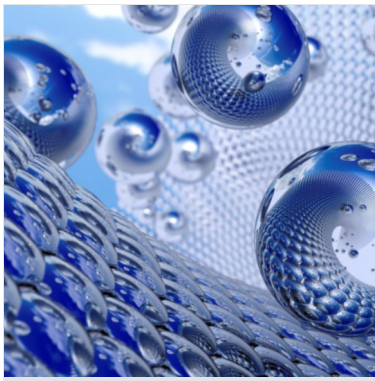
SUGGESTED FLOW COATING FORMULATION

Visgard 106-94 Part A	100 parts
Visgard 106-94 Part B	40 parts
Tertiary Butyl Alcohol	28 parts
Diacetone Alcohol	42 parts
Solids	26 - 28%
Viscosity	16 cp

All solvents used should be >99.5% pure with water content below 0.15%.

Do not exceed 1:1 dilution based on the original volume of Visgard 106-94.

FSI can supply both diacetone alcohol or tertiary butyl alcohol/diacetone alcohol (90/10) mix.



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POT LIFE

The pot life of Visgard solutions depends on the environment, specifically the level of humidity in mixing and application areas. At 22°C (72°F) and 35% relative humidity (RH), the pot life will be 7 - 21 days. At >70% RH the pot life may be reduced to 36 hours and gels may form. Cooling to 4°C (39°F) extends the pot life, possibly to two (2) months or longer if the RH is <30%. Adding freshly mixed solution to material in process and reducing the solids content to 20% also extends the working life. With low RH, cooling and sufficient turnover, it may be possible to avoid gelation. When the pot life of the mixed solution has been reached, the material will increase in viscosity and gel. This can be stopped by adding a mixture of methanol and toluene (1:1).

EQUIPMENT PREPARATION

Equipment Cleaning: Coating equipment should be cleaned prior to using Visgard 106-94 to avoid any possible contamination. Coating contamination can result in problems with adhesion, poor Anti-Fog performance or general appearance. The cleaning process should include multiple solvent rinses (utilizing a solvent compatible with the material in prior use with the equipment) followed by a thorough Diacetone Alcohol rinse. Diacetone Alcohol, Methyl Ethyl Ketone or Isopropanol may be used for cleaning equipment after the use of Visgard 106-94.

Equipment Materials: Silicone hard coatings are incompatible with Visgard 106-94 and will impair anti-fog performance even at low concentrations. Be sure all equipment is thoroughly clean and free from other coating residues before evaluating Visgard 106-94 in production systems. A peristaltic pump is recommended for initial tests because there is no actual contact of Visgard 106-94 with the pump chamber or mechanical parts. Visgard 106-94 is incompatible with PVC tubing due to plasticizer extraction. Use only PTFE, LDPE, PU or stainless-steel tubing. Circulating Diacetone Alcohol through the pump, hoses and filter for 8-12 hours is recommended for removing possible contaminants before start-up or change over.

Adding 10% isopropyl alcohol to any leftover Visgard will help prevent gelation so waste can be properly disposed.

PRETREATMENT AND CLEANING OF SUBSTRATE

Parts to be coated with Visgard 106-94 should be clean and free of any surface residues. Injection molded polycarbonate parts should be cleaned with a neutral detergent solution to remove any residues left on the parts from the molding process, and then rinsed thoroughly with de-ionized water.

HEALTH AND SAFETY INFORMATION

Before using this product, read and understand the Safety Data Sheet (SDS) which provides information on health, physical, and environmental hazards, handling precautions and first aid recommendations. For a copy of an SDS, contact a sales or customer service representative.

WARRANTY AND LIABILITY LIMITATIONS

Information contained herein is accurate to the best of our knowledge. The coating solution properties and cured coating properties listed herein represent typical values for Visgard 106-94 and are not meant as specifications. FSICT insists that users conduct their own tests for applicability and fitness for any purpose. Statements concerning use of products or formulations described herein shall not be construed as a warranty or license to infringe any patent or trademark, and no liability for infringement arising out of such use is assumed. Please refer to FSICT Standard Terms and Conditions or to your Purchase Agreement with FSICT for the warranty coverage of FSICT's product.

PRODUCT SHIPPING AND AVAILABILITY

Typical lead-time for shipment of Visgard 106-94 is four (4) weeks from confirmation of a purchase order. FSICT provides several shipping options. Please contact an SDC representative to determine which option best fits your needs.

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