



TECHNICAL DATA SHEET

Abrasion Resistant Anti-fog Coating 7-TS-116

General Description

This anti-fog and condensation control coating is a heat stable, non-yellowing waterborne single part melamine coating solution imparting anti-fog and scratch resistant properties to plastic substrates.

The 7-TS-116 antifog coating is a resin-water-solvent mixture producing a permanent anti-fog film on plastic substrates post heat cure.

Typical Physical Properties

<u>Property</u>	<u>Temp</u>	<u>Unit</u>	<u>Approved Spec. Range</u>
Appearance (Visual)	RT	NA	Clear to Slightly Hazy
Color (Visual)	RT	NA	Clear to Opaque
pH (PHA 1.1)	25° C	NA	9.0 – 10.5
Non-volatiles (NVN 1.1)	NA	%	6.5 – 7.7
Specific Gravity (SPG 1.0)	25° C	g/ml	0.978 - 0.994
Viscosity (BKV 1.0) (#2 Spindle @ 60 rpm)	25° C	Cps	< 100

Coating Methods and Application

The anti-fog coating can be roll, dip, curtain or HVLP spray coated. As process variables differ, a patch test should be made to determine solvent tolerance in presence of heat per each substrate. For sheeting applications the recommended dry coating thickness is .05 to 1.0 mils (10 to 25 microns). Condensation sheeting effect is indifferent to coating thickness. If the substrate is contaminated with grease, water or oils, this can destroy the anti-fog adherence properties. For pieces handled prior to coating we recommend the surface be cleaned with an alcohol such as methanol or Isopropanol.

Viscosity dilution with Isopropanol or distilled water is not recommended but could sometimes be required for certain spray applications. Dilution level below 95% of the original solution and the solids content will be below acceptable levels. This will negatively impact the overall anti-fog properties. Theoretical coverage range is 750-1200 sq. ft. per gallon at 12 micron thickness. In HVLP spray applications use 8-10 psi typical of automotive paints. If the spray fan of coating shows spotty coverage increase air pressure incrementally until an even coating. The 2098-680C can be layered to achieve coating thickness.

The 7-TS-116 anti-fog coating is for acrylic, polycarbonate (PC) and polyester (PET) applications. The anti-fog coating has excellent adhesion and light transmission >99%. To promote improved adhesion to polyolefin substrates corona treatment is recommended.

The shelf life of virgin solution is 9 months. The useful life can be extended if stored in a refrigerated area. High humidity will not affect the performance of the anti-fog coating however, care should be exercised to not contaminate the solution with other reactive additives.

As supplied the 7-TS-116 anti-fog solution is filtered using 5 micron filtration, left over or recycled coating solution must be filtered through a 5-10 micron filter before reapplying to a substrate to eliminate potential contaminants. Coating thickness, cure time, heating temperature, and coating method can each influence the wet coat, flow and adhesion to a substrate.

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Coating Cure

Coating performance is reduced, if not properly cured. Adhesion to substrate, crazing and antifog properties can be affected. We recommend a thermal cure of 125C for 2 hours. Performance is improved if coating can air dry for a few minutes before any thermal dry cycle.

The following are approximate time and temperatures. With variance in thermal curing systems we recommend running a time and temperature trial to determine optimal condition.

Temperature

110C – 230F
125C – 257F
140C – 302F

Time

1 Hour (2 hours is optimal)
30 Mins (2 hours is optimal)
10 Mins (1 hour is optimal)

Chemical Resistance

A properly cured anti-fog coating will have abrasion resistance to “typical impacts” and most household cleaners and cleaning methods. Though a hard coating when dry, this hydrophilic coating when hydrated will soften and exhibit reduced abrasion resistance. The 2098-680C coating will cyclically dry and rewet so abrasion resistance will vary during these cycles. The anti-fog coating should not be exposed to strong acids or oxidizing materials. For optimal water submersion applications the cure time should be increased to 2 hours.

Property	Value	Unit	Comment
Typical contact angle – Polycarbonate	4°	Degrees	Depends on coating thickness
Refractive index – Polycarbonate	1.39		
Scratch Resistance - Polycarbonate	250 g	ASTM - 5178	Dry test
Abrasion Resistance - Polycarbonate	0.563	ASTM D 1044-08	non abraded surface
Abrasion Resistance - Polycarbonate	0.203	ASTM D 1044-08	abraded surface

Clean Up

Best to do equipment clean up before the coating solidifies. Coating residual can be cleaned with water or IPA isopropyl alcohol. Adhere to local ordinances before disposal in wastewater systems. For spray application systems we recommend cleanup with MEK, MIBK or similar solvent. Check with the spray equipment supplier for recommended cleaning solvents.

Safety Precautions

Flash Point : > 35° C (Closed Cup)

Skin contact may cause local redness; wash with soap and water. Eye contact may cause redness or swelling of conjunctiva; flush with water for 15 minutes. Swallowing or inhalation may cause headache, vomiting, diarrhea, dizziness, drowsiness, nausea; administer oxygen or fresh air.

Use proper steel drum grounding during liquid transfer. Wear neoprene gloves, safety glasses and protective clothing.