Technical Data Sheet

US Patent 5262475

Vistex® Fog-Free Film

Vistex 200 (Pressure Sensitive Adhesive on Reverse)
Vistex 275 (No Adhesive)

DESCRIPTION

Anti-Fog coated polyester Film, available with or without optically clear adhesive backing. Available in two standard thicknesses (2 mil and 4 mil) in various widths or shapes. Can be soaked in water repeatedly without loosing anti-fog properties. Tool and die capabilities for custom shapes.

FEATURES

- Permanent Anti-Fog Protection
- Excellent Optical Clarity
- Extremely Hydrophilic
- Exceptional Anti-Fog and Water Sheeting Performance
- Absorbs Moisture, Does Not Dissolve in Water
- Will Not Discolor from Sunlight or Heat
- Wet and Dry Application Compatible

BENEFITS

- High quality anti-fog surface improves product durability and visual clarity.
- Optically clear, pressure sensitive backside adhesive surface protected by a release liner.
- Easy to install and maintain anti-fog surface .

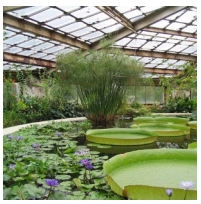
Premium, Permanent Anti-Fog Coating Cured on a Thin Polyester Base

Product Application

- **Swim Goggles**
- **Diving Masks & Water Sports**
- **Glass & Plastic Lenses**
- **Windows & Mirrors**

Vistex Anti-Fog coated film delivers best-in-class permanent Anti-Fog Properties with exceptional product stability and optical clarity.

Vistex Film may be laminated to any flat or cylindrical substrate to prevent the formation of vision obscuring fog on glass, plastic lenses, windows, and mirrors. Vistex Film consist of a permanent anti-fog coating cured on a thin polyester base with or without any optically clear adhesive and a protective release liner on the reverse side.



Substrates
Glass and Plastics

Available in 2 mil (50 micron), 4 mil (100 micron) thickness. The true film thickness refers to polyester base, which is actually thinner than the nominal gauge. The adhesive and release liner thickness are additional to the thickness of the base film.

Physical Characteristics	
Appearance	Crystal clear & colorless
Visible Light Transmission	90%
Tear Strength (initial)	2 mil—3.2 lbs. (1.4 kg) 4 mil—8.4 lbs. (3.8 kg)
Heat Tolerance	Adhesive: -20°F to 302°F-29°C to 150° C) Anti-Fog Film: -40°F to 350°F (-40°C to 175° C)

Note: The heat tolerance of the adhesive may appear less than noted above when applied on certain plastic materials. In actuality this is not a characteristic of the film or the adhesive, but rather the outgassing of the plastic substrate due to the elevated temperature. Such materials should be pre-dried before film installation.

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PRODUCT AVAILABILITY & SHIPPING

Typical lead-time for shipment of Vistex Fog Free Film is four (4) weeks from confirmation of a purchase order. FSICT provides several shipping options. Please contact an FSICT representative to determine which option best fits your needs. All orders are shipped F.O.B. Additional shipment charges including customs clearance and fees (if applicable) are the responsibility of the customer.

HEALTH & 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 an FSICT sales or customer service representative.**

WARRANTY & LIABILITY LIMITATIONS

This document does not constitute any warranty or representation regarding FSICT's product. Please refer to FISCT Coating Technologies Standard Terms and Conditions or to your purchase agreement with FSICT for the warranty coverage of FSICT's product.

Testing and Installation

Anti-Fog Coating

The anti-fog treatment is a patented polymer coating that prevents or reduces fogging under all temperature-humidity conditions, even after extended immersion in water or repeated cleanings. The Vistex treatment is extremely hydrophilic which causes water droplets to spread, rather than form beads which appear as fog. Although it absorbs moisture, the coating does not dissolve in water, so it will not smudge when wet. Vistex Film is not adversely affected by commercial glass cleaners and detergents, ammonia, alcohols, or even organic solvents such as acetone, toluene, or trichloreth-ylene. It will not discolor from exposure to sunlight or heat.

Durability

Scratch resistance is superior to most untreated plastics. Superficial scratches in the coating that do appear will heal themselves when moistened with water or by breathing on the film. The following data were obtained using a fine (white) Scotch Brite® Abrasive Pad at 500 gr. per cm as measured by a UV-visible spectrophotometer:

Visible Light Transmission (440nm)			
Abrasive Cycles	Uncoated Poly-carbonate	Vistex	Uncoated Polyester
0	90.7%	90.7%	89.4%
2	90.1%	88.3%	87.0%
5	89.3%	86.9%	85.4%*
10	88.5%	84.4%	83.0%*
2-	87.7%	81.6%	80.0%*

***Obvious impairment of clarity**

Pressure Sensitive Adhesive (PSA) (Vistex 200)

An optically clear adhesive recommended for use with pressure roll laminating machinery or by professional installers familiar with the handling of adhesive films. The adhesive bonds immediately to glass and plastics, even plastics treated with abrasion resistant silicone or melamine coatings, although at reduced peel strength. Minimum peel strength approx. 2.5 lbs. per lineal inch after adhesive aging over uncoated polycarbonate. Adhesion increases slightly over 5 to 10 days. Adhesive bond strength will be reduced after extended immersion in water, but bond will re-strengthen on drying.

Two mil PSA film may be applied dry, with laminating equipment, or by wet method (**see installation**). Four Mil PSA film should be applied dry, with laminating equipment for best results.

Adhesive Bond Strength		
Acrylic/ Polycarbonate	70 oz/in. 50 - 90 oz/in.	Average Range
Glass	80 oz/in. 60 - 100 oz/in.	Average Range
Expected Sheer Strength	1000 Hours	
Tack	270 gr/cm² 100-450 gr/cm²	Average Range
Minimum Application Temperature	30°F (-1°C)	

Installation with Laminating Machinery

A clean room environment and proper laminating equipment is recommended when applying Vistex Film. Please contact an FSICT representative for a list of appropriate laminating equipment companies at technicalsupport@fsicti.com.

Installation by Hand

Where laminating machinery is not available or not practical, Vistex Film may be installed by hand using a wet application technique. For pressure sensitive adhesives, a dilute detergent solution is required to prevent premature "grab" which will trap pockets of air or water. Detergent allows the film to be positioned and then locked in place with light force so it will not shift when squeegee pressure is applied.

Film should be installed on a clean surface that is flat or curved in one dimension only. With detergent solution, spray surface to be treated. Separate release liner from film with cellophane tape attached to the front and back of a single corner. Thoroughly wet adhesive coating with the detergent solution. Place the wetted film on the wetted surface. Spray film surface with detergent solution to reduce friction, and apply firm pressure with a urethane squeegee to evacuate liquid from beneath the film. Use overlapping strokes to prevent trapping pockets of water or air. If milky blotches appear, too much water remained after squeegeeing. Water will dry in time and blotches and any distortion will disappear.

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Care and Suggested Tests

Slight Compound Curvature

If the substrate does have a slight compound curvature, Vistex Film may still be applied with a pressure roll laminating machine. Alternatively, a film without adhesive may be used in conjunction with double faced tape or adhesive foam. Or, adhesive can be applied in a specific pattern, i.e. around the perimeter of the shape. FSI will produce such products to specific requirements.

Care Instructions

Treated surfaces may be cleaned with household glass cleaner (such as Windex®) and a sponge, tissue or paper towel. Do not use cleaners that contain abrasives, strong acids, or caustic substances.

Remove oily contamination with a grease cutting cleaner, such as Formula 409®, Fantastik®, or Mr. Clean®. It is normal for the coating to pass through a tacky phase as it dries. To clean, wipe with a wet cloth or paper towel and allow to dry. **DO NOT TRY TO RUB TO DRYNESS**. This will leave smudges and will necessitate cleaning again.

To remove film, slide razor blade beneath one corner and lift slowly. Peeling too fast will cause adhesive to remain on the surface. If traces of adhesive do remain, remove with rubbing alcohol (50%-70% isopropyl alcohol). Plastics should be tested first for solvent sensitivity.

Storage

Vistex film should be stored in an environmentally controlled area with relative humidity of less than 60%.

Suggested Tests for Vistex

Anti-Fog Test #1 - The test surface is cleaned with tap water and wiped dry with a paper towel. It is then placed face down over a container of warm water (122°F/50°C) so as to completely cover the opening. Vistex Film should remain clear of fog indefinitely. When sufficient moisture has condensed to form large water drops, the test is complete.

Anti-Fog Test #2 - The test surface is immersed in distilled or deionized water for 24 hours, then removed and wiped dry with a paper towel. The sample is then cooled in a refrigerator to approximately 40°F (4°C) and withdrawn to a test chamber containing ambient air at 70°F (21°C) and 70% to 80% relative humidity. Vistex Film will remain free of fog indefinitely.

Untreated plastics or glass will fog in a few seconds. Inferior anti-fog coatings may fog immediately, or remain clear for a short time until they become saturated.

Durability Test - The anti-fog treated sample is wetted and scrubbed 10 times (back and forth) with a white Scotch Brite® Pad at 500g/cm² load, then wiped dry. Vistex treated areas will show little or no evidence of scratching. Uncoated plastics will develop considerable haze (10% to 20%) due to scratching. Inferior anti-fog coatings are more prone to scratch than untreated plastics, and may also peel or abrade from the surface.

Vistex®

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