Technical Data Sheet

US Patent 5877254

Visgard® Fog-Free PET Film

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

DESCRIPTION

Abrasion resistant Anti-Fog coated polyester film with or without optically clear adhesive backing. Patented anti-fog coating on PET surface prevents the formation of fog wherever the film is applied or installed. The anti-fog surface also has a water clear masking which protects the coated surface during installation.

FEATURES

- Excellent Abrasion, Scratch, and Mar Resistance
- Extremely Hydrophilic
- Exceptional Anti-Fog and Water Sheeting Performance
- Anti-Fog Coating Absorbs Moisture, and Cannot be 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 with clear masking protects the coated surface during installation.

Premium Anti-Fog, Abrasion, Scratch and Mar Resistance

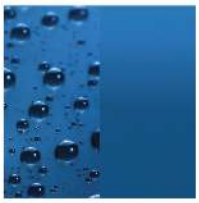
Product Application

- Medical, Military, Safety & Sports Eyewear
- Face Shields, Goggles, Masks & Visors
- Electronic Displays & Devices
- Custom Appliqué Shapes

Visgard 200 and 275 Anti-Fog coated polyester (PET) film is extremely hydrophilic, delivering best-in-class abrasion, scratch, and mar resistance, exceptional product stability and optical clarity. Sold in both 2 ml and 4 ml thickness with or without adhesive. Coating will not scratch under standard usage. The film can be installed using either dry laminating machinery, or by hand, using a wet application technique.

Substrate Materials

Can be adhered to all optically clear flat and single curved surfaces.



Physical Characteristics	
Appearance	Crystal clear and colorless. The removable masking is also clear and must be removed.
Visible Light Transmission	90%
Tear Strength (initial)	2 mil—4.2 lbs. (1.9 kg) 4 mil.—8.4 lbs. (3.8 kg)
Heat Tolerance	300°F (148.8°C)

Available in 2 mil and 4 mil (50 and 100 micron) thickness. The adhesive, release liner, and masking thickness are additional to the thickness of the base film.

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Visgard® Fog-Free PET Film

Anti-Fog, Abrasion, Scratch and Mar Resistance

PRODUCT AVAILABILITY & SHIPPING

Typical lead-time for shipment of Visgard Anti-Fog 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 Use

Anti-Fog Coating

The anti-fog treatment is a patented polymer coating which prevents or reduces fogging under normal temperature-humidity conditions[1], even after repeated cleanings. The Visgard treatment is extremely hydrophilic which causes condensation to spread as a clear layer, rather than form droplets which appear as fog. Although it absorbs moisture, the coating does not dissolve in water, so it will not smudge when wet. Visgard Film is not adversely affected by commercial glass cleaners and detergents. It will not discolor from exposure to sunlight or heat.

[1]**Conditions with high humidity and extreme cold may cause frosting.**

Scratch Resistance

Rubbing lightly with #0000 steel wool will leave only a few scratches on the Visgard surface. Occasionally, fine scratches will appear but will heal when moistened, or after simply standing at room temperature for 15 to 20 minutes.

The following data were obtained using a Taber abrader with a CS10F wheel and 500g load, according to ASTM D1044:

	100 Cycles	500 Cycles
Uncoated Polyester	20% (approx.) Δ haze	66% (approx.) Δ haze
Visgard Film	5.6% Δ haze	25.5% Δ haze

Falling sand abrasion was performed according to ASTM D968 using 3 kg standard Ottawa sand.

Anti-Fog Tests

Uncoated Polyester	30% (approx.) Δ haze
Visgard Film	1.49% Δ haze

Test #1 - The test surface is immersed in distilled or deionized water for 1 hr. and allowed to dry for at least 1 hr. It is then placed face down over a container of warm water (112°F/50°C) so as to completely cover the opening. Visgard coatings may exhibit a ring of condensation as the coating hydrates, but will remain clear thereafter. The test is complete when sufficient moisture has condensed to form large water drops.

Anti-Fog Tests (cont.)

Test #2 - The test surface is immersed in distilled or deionized water for 24 hours, removed and allowed to dry for at least 1 hr. 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. Material coated with Visgard will remain free of fog indefinitely.

Untreated plastics or glass will fog within seconds. Inferior anti-fog coatings may fog immediately, or remain clear for a short time until they become saturated. Visgard exceeds ASTM and European tests for resistance to fogging.

Pressure Sensitive Adhesive (PSA) Visgard 200

FSI Coating Technologies uses 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. Peel strength increases slightly after 5 to 10 days. The adhesive bond strength will be reduced after extended immersion in water, but bond will re-strengthen on drying.

The adhesive was chosen because it remains a self-cross linking acrylic polymer that cures at moderate temperatures. The adhesive was specifically designed for low temperature bonding applications. This particular adhesive remains tacky and bondable to temperatures as low as -20° F. Additionally. the adhesive has been chosen:

- as it contains no surface additives which could whiten or haze in the presence of moisture and
- the initial peal strength ensures permanent adhesion

Adhesive Bond Strength	
Acrylic/Polycarbonate	Approx. 15 oz./in.
Glass	Approx. 6 oz./in.
Tack	Approx. 0.20 lbs./ft²
Sheer Strength	Approx. 200 hours
Minimum Application Temperature	30°F (-1°C)

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Anti-Fog, Abrasion, Scratch and Mar Resistance

Installation, Care & Removal

Installation with Laminating Machinery

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

Installation by Hand

Where laminating machinery is not available or not practical, Visgard 200 Fog-Free Film may be installed by hand using a wet application technique. To prevent premature "grab" which will trap pockets of air or water, a preferred wetting solution for pressure sensitive adhesives is DI water with up to 1.0% of non-abrasive liquid hand soap. To begin the application, spray the wetting agent on the substrate, then on the exposed adhesive backing and put in place, but without pressure. Then spray the film surface with the same application solution so a squeegee can glide over during application.

Apply 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, excess water remained after squeegeeing. The water will dry in time, and blotches and distortion will disappear.

Care and Instructions

Treated surfaces may be cleaned with household glass cleaner (such as ammonia-free Windex®) and a sponge, tissue or paper towel. Cleaners containing alcohol may be used but the alcohol content should be no greater than 30% of the solution. Do not use cleaners which contain moisturizers, abrasives, strong acids, or caustic substances.

Remove any oily contamination with a grease cutting cleaner, such as Fantastik® or Mr. Clean®.

Visgard®

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