Benefits

1. Provide Glass Breakage Safety:
   Made with 4mil, heavy-duty polyester bonded by strong adhesives, these films provide a clear and invisible – yet powerful – barrier that help hold glass in place in the event of an impact or earthquake. While this barrier helps protect against the damaging effects of flying shattered glass, it also makes it much more difficult for an intruder to smash through the windows quickly.
2. No need to replace existing glass.
3. They are easily removed and replaced - clean removable after 7 years.
4. The patterns do not distract from interior viewing.
5. Will not alter viewing from outside into retail storefronts.
6. **SOLYX®** Bird Safety Films block 98% of harmful UV rays.
7. Leed: Innovations in Operations & Upgrades - Credits 1: Innovation in Upgrades, Operations, and Maintenance - 1 point
   Intent - Provide the opportunity for LEED points for additional environmental benefits beyond those in other LEED Rating System areas - The 99% UV Protection provided helps protect occupants and furnishings from harmful and damaging UV rays. Many window films are recognized by the Skin Cancer Foundation as effective for protection against skin cancer.

Material Threat Factors (MTF)

- SX-BSFV Vertical Pattern - MTF: 20
- SX-BSFH Horizontal Pattern - MTF: 10
- SX-BSFT Trellis Pattern - MTF: 10
- SX-BSFD Frost Dot - MTF: 15

What is a Material Threat Factor?

It is difficult to objectively define what makes glass "bird-friendly." Although used frequently, the term itself provides no specific guidance. Architects interested in designing a building that does not kill birds can select products for their insulation value, breaking strength, or a host of other characteristics, but until recently there was no system for specifying bird-friendly materials. Making things more difficult, the quality of being bird-friendly is more complex than a quality like insulation value because glass varies so much in appearance – from one time of day or season to another, with different reflected environments, etc. – so an absolute measurement cannot be provided. In 2010, American Bird Conservancy and a team of architects interested in advancing the field of bird-friendly design developed the concept of Material Threat Factor commonly Threat Factor (or TF) as a way to assign scores that provide a relative measure of birds' ability to see and avoid patterned glass and other materials. These scores allow architects to design buildings using rated glass and also permit evaluation of products that can be applied to existing glass (retrofits) to reduce collisions. TFs also made it possible to create a credit for reducing bird collisions in the LEED rating system.

Where Do Threat Factors Come From?

Ideally, Threat Factors could be derived from monitoring collisions on glass at a diversity of existing buildings, replacing that glass with a product under review, and then continuing to monitor to see whether collisions are reduced. Unfortunately, this type of data is very rare, and this type of test would be very costly. It would also take years to acquire enough monitoring data to reliably detect a trend and, importantly, it would kill birds.

ABC realized the need to create practical ways to evaluate glass. In 2003, Martin Rössler created the first "tunnel" at the Hohenau-Ringelsdorf Biological Station (Austria), to test proposed solutions to bird collisions on freestanding noise barriers. ABC's tunnel, using the same design, followed in 2009. Tunnel testing is a non-injurious, standardized binomial choice technique that uses wild songbirds to determine the relative effectiveness of patterns at deterring bird collisions. In the U.S., tunnel testing takes place at American Bird Conservancy's tunnel at the Carnegie Museum of Natural History's Powdermill Avian Research Center.

In a test flight, a bird flies down a completely dark space, the 'tunnel', toward light at the far end, where side-by-side panels of glass appear to offer exit routes. One of these panes of glass is clear glass (the control, invisible to the bird) and the other has the pattern under evaluation (the test). A net ensures that birds are safely stopped before they hit the glass. After a trial, birds are immediately released. When few birds fly to the patterned glass, we believe that they see and are avoiding the pattern. For a detailed description of the Powdermill and Hohenau tunnels, see Sheppard (2019) and Roessler et al. (2007).

The threat factor of a material is based on flying at least 80 individual birds down the tunnel and recording whether they fly toward the control or to the patterned test pane.

For example, suppose 80 birds flew down the tunnel, with 20 flying toward the test pattern and 60 toward the control. 25% (20/80) of the birds flew toward the test pattern and it would therefore have TF=25.

It is important to note two things:

- Threat Factors do not equal the percent reduction in collisions expected when a glass is installed on a building. In fact, the same glass may perform differently on each facade of a building, depending on angle to the sun, habitat reflected, etc. Threat factors are an index, reflecting the relative response to different patterns by songbirds flown in the tunnel. However, where monitoring data on tunnel-tested products are available, they confirm that products with lower threat factors have yielded fewer collisions. ABC defines “bird-friendly” materials conservatively, as having a threat factor ≤30, corresponding to a reduction of collisions of at least 50% under real world conditions.

- The lower the TF, the more effective the test pattern will be at reducing collisions. This has been confirmed when data is available. However, the relationship is not linear, so one cannot say that a pattern with TF=15 is twice as effective as a pattern with TF=30.

Weathering Testing

Weathering testing was completed May 25, 2016, on the Bird Safety Films and we are extremely pleased with the results.

As a result, we can now give a 3-year warranty for the bird safety films. The expected lifecycle cost can be based on a minimum of 7 years.

The QUV testing of the UV lines has completed 3000 hours, representing 5-6 years outdoors.

There is no color shift observed and the safety line pattern bond is good.

The QUV cycle was 8 hrs. @ 70°C and 4 hrs. Condensation @ 40°C using UVA 340 bulbs.

Solar and Physical Properties

Performance Results	(3mm)	(6mm)	(3mm+3mm)
Solar Energy			
% Transmittance	78	73	66
% Absorptance	14	19	21
% Reflectance	8	8	13
Visible Light			
% Transmittance	89	88	81
% Reflectance Exterior	10	9	16
% Reflectance Interior	10	9	16
Emissivity	.90	.90	.90
Winter U-Factor (BTU hr/ft² °F)	1.04	1.02	.48
Shading Coefficient	.95	.90	.83
Solar Heat Gain Coefficient	.82	.78	.72
Solar Selectivity Index – Luminous Efficacy (VLT/SC)	.94	.97	.97
Light to Solar Heat Gain Factor (VLT/SHGC)	1.08	1.12	1.12
% Ultraviolet Light Blocked @ 300 to 380 nm	>99	>99	>99
% Total Solar Energy Rejected	18	22	28
% Summer Solar Heat Gain Reduction	4	4	5
% Glare Reduction	1	1	1

Physical Properties Nominal

Gauge	4.0 mil (100 micron)
Peel Strength	>2,500 g/in (985g/cm)
Tensile Strength	30,000 lbs/in^2 (2,110 kg/cm^2)
Break Strength	120 lbs/in (22 kg/cm)
ASTM D4830 Puncture Test	70 lbs (32 kg)