Saflex™ from Eastman

Bird friendly made beautiful

Saflex™ FlySafe™ 3D

Every year, billions of birds collide into buildings.

It's a global problem. Given the prevalence of glass in modern architecture, countless birds are killed as they navigate along migratory pathways and strike windows, link bridges and curtain walls. They fail to see glass, misjudge reflections or are attracted to internal lights — all leading to avoidable collisions.

To address the problem, an increasing number of cities and countries worldwide are passing legislation that requires new construction to feature bird-friendly glass. Architects, designers and builders need to act now to specify appropriate solutions. Choosing the right solution is easier than ever with Saflex™ FlySafe™ 3D PVB interlayers.

Introducing highly effective,* bird-friendly solutions that do not compromise on aesthetics.

To address the global challenge of birds colliding with glass in buildings, Eastman has introduced FlySafe 3D with an extended portfolio of options. These unique PVB interlayers give architects and facade engineers the freedom to create visually stunning buildings while still protecting birds. With more options available, designers can select the best bird protection for each project. FlySafe 3D is recognized in the industry and by ornithologists as one of the best solutions with minimal obscuring of views and long-lasting durability.

**FlySafe 3D with 9-mm shiny and matte sequins is highly effective, as confirmed through testing conducted at Collision Laboratories, showing approaches as low as 9%. The American Bird Conservancy (ABC) has assigned these configurations a Material Threat Factor (TF) of 9.*

The 6-mm sequins show effectiveness with approaches as low as 11% and a TF of 11 with the laminate placement inboard within the insulating glass unit.

Protect birds as well as your reputation.

The Helios School | Cologne, Germany

Nordic Ski Center Goms I Switzerland

The greater the bird traffic by your building, the greater the danger of impact for birds in flight. Choose bird-friendly Saflex interlayers to protect them, your reputation and even your bottom line.

In collaboration with Collision Laboratories in Hohenau-Ringelsdorf, Austria, Saflex FlySafe 3D was tested using the WinTest, a test conducted in a flight tunnel that confirmed its effectiveness in reducing bird collisions. The American Bird Conservancy (ABC) has assigned Saflex FlySafe 3D a Threat Factor of less than 10 for 9-mm shiny and matte sequins, and a Threat Factor of 13 or less for 6-mm shiny and matte sequins spaced no more than 90 mm in a square grid.* The use of FlySafe 3D can contribute to LEED® innovation credit for bird collision deterrence.

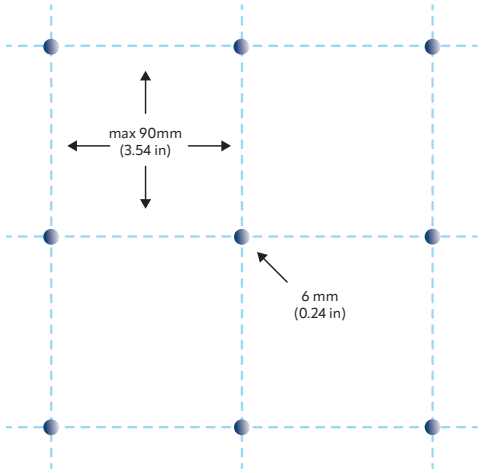
** Material Threat Factor can vary for each product, depending on sequin size and laminate position. Please check specific product for more details.*

A safer glass for birds.
A beautiful glass for buildings.

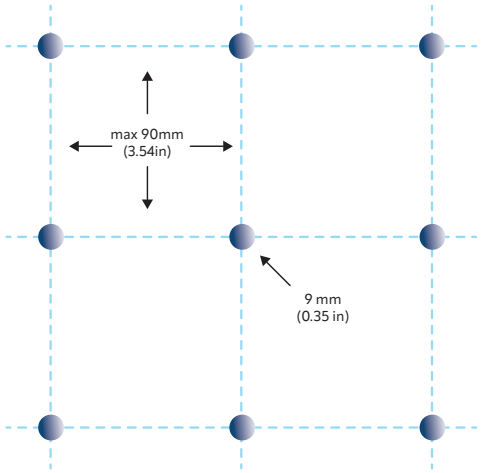
Saflex FlySafe 3D uses 3D sequins that catch and reflect light to deter birds from glass. Unlike current alternatives on the market, the sequins are discreet and don't obscure views or compromise the aesthetics of your exterior glass designs. The grid pattern consists of rows and columns of sequins available in two sizes — 6 mm (0.24 in.) and 9 mm (0.35 in.) in diameter — separated on all sides by not more than 90 mm (3.5 in.). This includes two sequin options of silver matte and silver shiny.

FlySafe 3D can also be configured with a 9-mm shiny sequin for both the interior and exterior sides.

6-mm grid pattern



9-mm grid pattern



Saflex FlySafe 3D sequin options

Key benefits

Highly effective

The 3D sequins in Saflex FlySafe 3D offer an effective method of avoiding avian in-flight collisions, maintaining glass as a preferred design element. FlySafe 3D with 9-mm sequins is highly effective, achieving 9% approaches and a Threat Factor (TF) 9 per ABC.

6-mm sequins achieve up to 11% approaches, with ABC TF values of 11 or less with low-e coating on surface 2 and the laminate with Saflex FlySafe 3D in the inboard position of the insulating glass configuration.

- Compatible with various glazing configurations and select coatings*
- Contributes to LEED® innovation credit for bird collision deterrence

Minimal visual obscuring

Unlike bird protection glass that uses screen printing, etching or UV coating solutions, FlySafe 3D uses discreet and optimally placed sequins to avert birds without compromising views.

FlySafe 3D offers two sequin sizes: 6-mm and 9-mm diameter, both with coverage below 1%.

Design freedom

FlySafe 3D bird protection glazing is compatible with all architectural grade Saflex PVB interlayers, though in some regions the interlayer configuration is restricted to only clear products such as Saflex Acoustic, Structural and Storm PVB interlayers. This compatibility enables architects and glass laminators to mitigate bird strikes without compromising safety, security, structural integrity, aesthetics, UV screening or acoustic control.

With more options, architects can choose between a matte and shiny sequin, along with sequin sizes that fit best with the design while exceeding industry standards.

Durable choice

Because it's an interlayer, your bird protection glass will last. The sequins are protected from the elements and cleaning tools and fluids, requiring only normal laminated glass cleaning and maintenance.

Ease of processing

Available in superwide (322 cm)

** Ability to use FlySafe 3D as the inboard or outboard laminate of an insulating glass unit. Check with a Saflex representative for more details.*

FlySafe 3D product offering in single laminated glass units

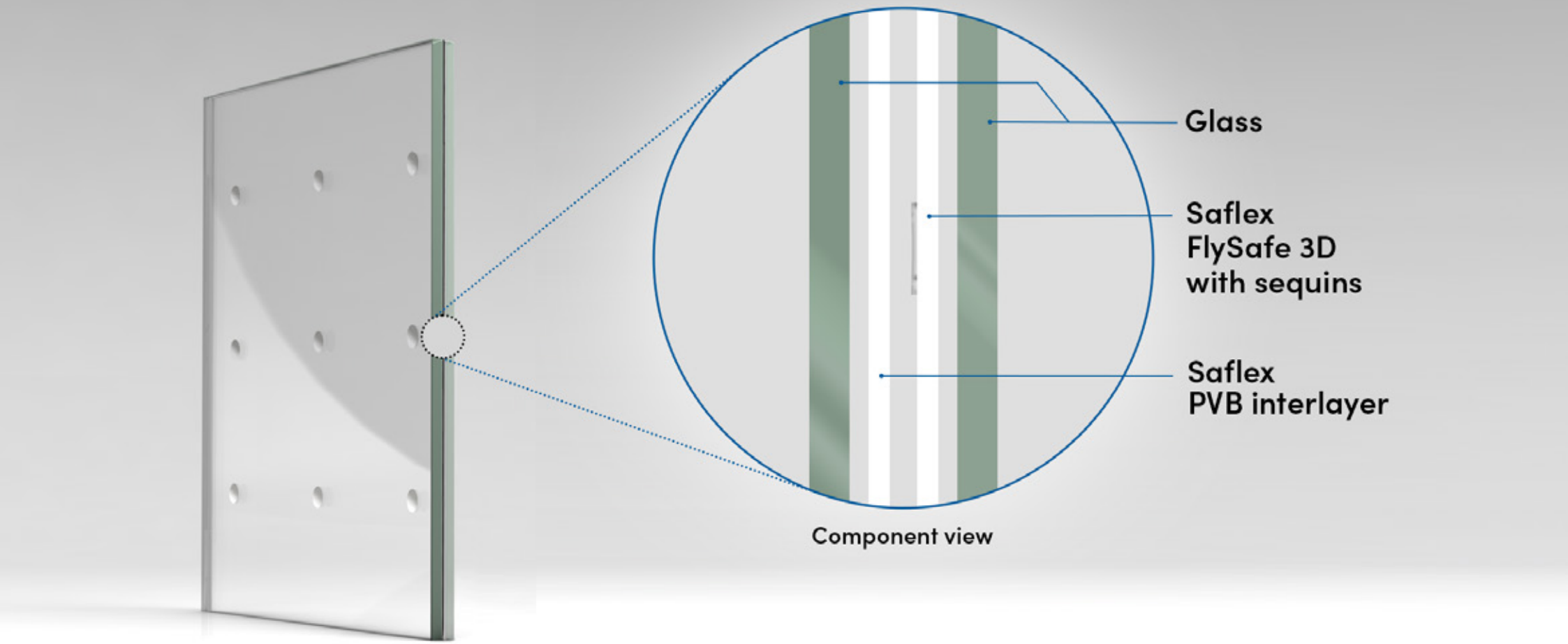
Sequin type Exterior | Interior	Grid pattern (mm)*	% Approaches (Threat Factor)	Glass coverage (%)
Shiny silver | Black	6 | 90	13	< 0.5
Matte silver | Black	6 | 90	13	< 0.5
Shiny silver | Black	9 | 90	9	< 1
Matte silver | Black	9 | 90	9	< 1
Shiny silver | Shiny silver	9 | 90	9	< 1

**Sequins are separated on all sides by not more than 90 mm (3.5 in.).*
Note: Testing completed at Collision Laboratories represents the percentage of birds that approach the test panel ("approaches"). ABC assigns Threat Factor (TF) based on this testing.

FlySafe 3D used in insulating glass units

Glazing detail Exterior [gap] interior	Grid Pattern (mm)**	% Approaches (Threat Factor)	Glass coverage (%)
4 mm | FlySafe 3D (shiny silver | black) 4 mm low-e coating [16 mm] 4 mm	9 | 90	6	< 1
4 mm low-e coating [16 mm] 4 mm | FlySafe 3D (shiny silver | black) 4 mm	6 | 90	11	< 0.5

**Assigned values based on extrapolation from testing and approvals.*
*** Sequins are separated on all sides by not more than 90 mm (3.5 in.).*
Note: Testing completed at Collision Laboratories represents the percentage of birds that approach the test panel ("approaches"). ABC assigns Threat Factor (TF) based on this testing.



Applications

- Atriums
- Balustrades
- Cladding
- Facades
- Glass fins
- Jalousies*
- Link bridges
- Noise protection walls
- Overhead and sloped glazing
- Podium glass
- Storefronts

** FlySafe 3D can be incorporated into jalousie-type slats that are operable within the insulating space of an IGU, similar to integrated blinds.*

Saflex FlySafe 3D performance properties

Technical data	Property	Test method	Units	Test conditions	Saflex Clear interlayer
Physical	Specific heat	ASTM E1269	jouels/kg · K	50°C	2108
	Specific gravity/density	ASTM D792	kg/m^3	23°C	1064.3
	Hardness[a]	ASTM D2240	Shore A	Cut/stacked to 12.5 mm	77
Mechanical	Elongation at fallure	ISO 527-3	%	23°C/50% RH; 50mm/min	–
	Young's modulus, E(t)[b]	EN 16613	MPa	20°C/3 sec	33
	Poisson's ratio	ASTM D638	–	23°C/50% RH	0.5
	Shear modulus, G(t)[b]	EN 16613	MPa	20°C/3 sec	11
	Tensile strength	ISO 527-3	MPa	23°C/50% RH; 50mm/min	–
Thermal	Coefficient of thermal expansion	ASTM E831	ppm/°C	30°–100 °C	183
	Thermal conductivity	ASTM D5930	W/m · K	60°C	0.2
Solar and optical	Haze	ASTM D1003	%	3–mm clear	< 1
	Refractive Index[a]	ASTM D542	–	23°C	1.479
	Yellowness Index	ASTM E313	YI	3–mm clear	< 1
	Solar transmittance[c]	LBNL WINDOW 7.0 NFRC 100	%	–	70%
	Visible transmittance[c]	LBNL WINDOW 7.0 NFRC 100	%	–	86%
	UV screening	Calculated	300- 380 mm	3–mm clear	> 99%

**Data based on 0.76-mm Saflex Clear R series and NOA for Sof1ex formulation unless otherwise indicated. [b]AddltJonal values for shear and Young's modulus are available for select temperatures and durations at saflex.com. [c]Solar, thermal and optlcal data based on 1.52-mm clear Saflex FlySafe 3D PVB Interlayer with clear, nominal 3-mm glass 9 I 90 sequin grid pattern. Calculations performed using OPTIC and WINDOW 7.0 by Lawrence Berkeley National Laboratory with area weighted average applied.*

FlySafe 3D product offering

Product	Thikness (mm)	Lengths (m)[a]	Widths (cm)[a]	Form	Sequins (exterior I interior)	Grid pattern
RA42 and RB42	0.76	Varies	Up to 322	Interleaved/ refrigerated	Shiny sequin I Black dot	6 I 90
					Matte sequin I Black dot	
					Shiny sequin I Black dot	9 I 90
					Matte sequin I Black dot	
					Shiny sequin I Black dot	

Consult your Saflex representative for width, length and form availability for your region.

Scan to learn more about FlySafe 3D.

saflex.com/flysafe