

# Saflex™ FlySafe™ 3D PVB interlayer

**A highly effective, bird-friendly glazing solution**



Birds colliding with glass on buildings is a global problem. Each year, billions of birds are killed as they navigate along migratory pathways and fly into glass windows, link bridges and curtain walls that reflect the open sky and trees.

To address this global concern, Eastman presents Saflex™ FlySafe™ 3D and its extended portfolio of options for an effective, low-coverage and bird-friendly PVB interlayer. An innovative and unique solution, FlySafe 3D interlayers enable glass professionals to support the construction industry with a highly effective,<sup>1</sup> aesthetically pleasing solution that can be produced with current manufacturing processes.

The pattern of FlySafe 3D covers the entire window and consists of 3D sequins available in two sizes, 6 mm (0.24 in.) or 9 mm (0.35 in.) in diameter, separated on all sides by 90 mm (3.54 in.) and oriented equivalently in both horizontal rows and vertical columns. This includes two sequin color options of silver matte and shiny. In addition, FlySafe 3D can be configured with a 9-mm shiny sequin for both the interior and exterior sides, which is ideal for noise protection walls.

The 3D reflective technology has been tested using flight tunnels in cooperation with the Collision Laboratories in Hohenau, Austria, which demonstrated the material's effectiveness in mitigating bird collisions. In addition, the American Bird Conservancy (ABC) has given FlySafe 3D a material threat factor of less than 10 for 9-mm shiny sequins not spaced more than 90 mm in a square grid.<sup>2</sup>

## Benefits

- **Highly effective, bird-friendly glazing solution**
  - Tested using flight tunnels at Collision Laboratories with 9% and 13% approaches<sup>1</sup>
  - Effective in different glass configurations with coatings<sup>3</sup>
  - Contributes to LEED® innovation credit for bird collision deterrence
- **Visually discreet sequins**
  - Minimal visual obstruction from inside
- **Design freedom**
  - Compatible with Saflex Structural, Saflex Acoustic, Saflex Storm and specific coatings
- **Durable choice**
  - Sequins are protected inside laminated glass for maximum durability
- **Same safety, security, acoustic, storm and UV screening attributes as conventional laminated Saflex products**
- **Ease of processing**
- **Available in superwide (322 cm)**

## Applications

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

<sup>1</sup>Flight tunnel testing at Collision Laboratories shows single unit laminates with FlySafe 3D 9-mm diameter matte and shiny sequins are highly effective with approaches at 9% while 6-mm sequins show an effectiveness at 13%. <sup>2</sup>Material threat factors can vary for each product, depending on sequin size. Please check the specific product for more details. <sup>3</sup>Ability to use FlySafe 3D in inboard or outboard laminate of and insulated glass unit. Please check the specific product for more details.

## FlySafe 3D product offering

Product	Thickness (mm)	Lengths (m) <sup>a</sup>	Widths (cm) <sup>a</sup>	Form	Sequin	Grid pattern (mm)	Approaches (%)
RA42 and RB42	0.76	Varies	Up to 322	Interleaved/ refrigerated	Shiny sequin   Black dot	6   90	13
					Matte sequin   Black dot		
					Shiny sequin   Black dot	9   90	9
					Matte sequin   Black dot		
					Shiny sequin   Shiny sequin		

<sup>a</sup> Range of available widths and lengths. Consult your Saflex representative for width, length and form availability for your region.

## Saflex FlySafe 3D used in insulating glass units

Glazing detail; exterior [gap] Interior	Grid pattern (mm)	Approaches (%)	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	13	< 0.5

**Note:** Flight tunnel testing completed at Collision Laboratories represents the percentage of birds that approach the test panel. The % approaches are typically translated into the threat factor.

## Saflex FlySafe 3D performance properties

Technical data	Property	Test method	Units	Test conditions	Saflex Clear interlayer
Physical	Specific heat	ASTM E1269	joules/kg • K	50°C	2108
	Specific gravity/density	ASTM D792	kg/m <sup>3</sup>	23°C	1064.3
	Hardness <sup>a</sup>	ASTM D2240	Shore A	Cut/stacked to 12.5 mm	77
Mechanical	Elongation at failure	ISO 527-3	%	23°C/50% RH; 50 mm/min	—
	Young's modulus, E(t) <sup>b</sup>	EN 16613	MPa	20°C/3 sec	33
	Poisson's ratio	ASTM D638	—	23°C/50% RH	0.5
	Shear modulus, G(t) <sup>b</sup>	EN 16613	MPa	20°C/3 sec	11
	Tensile strength	ISO 527-3	MPa	23°C/50% RH; 50 mm/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 <sup>a</sup>	ASTM D542	—	23°C	1.479
	Yellowness index	ASTM E313	YI	3-mm clear	< 1
	Solar transmittance <sup>c</sup>	LBNL WINDOW 7.0 NFRC 100	%	—	70%
	Visible transmittance <sup>c</sup>	LBNL WINDOW 7.0 NFRC 100	%	—	86%
	UV screening	Calculated	300–380 nm	3-mm clear	> 99%

<sup>a</sup>Data based on 0.76-mm Saflex Clear R series and NOA for Saflex formulation unless otherwise indicated. <sup>b</sup>Additional values for shear and Young's modulus are available for select temperatures and durations at saflex.com. <sup>c</sup>Solar, thermal and optical data based on 1.52-mm clear Saflex FlySafe 3D PVB interlayer with clear, nominal 3-mm glass 9|90 sequin grid pattern. Calculations performed using OPTIC and WINDOW 7.0 by Lawrence Berkeley National Laboratory with area weighted average applied.

## The architectural industry trusts Saflex and Vanceva color PVB interlayers.

Since 1937, glass fabricators have counted on Saflex for high-quality products, reliable service and expert advice to help deliver world-class technology for laminated glass. Eastman architectural glazing products include Saflex PVB interlayers for laminated glass as well as Vanceva color PVB interlayers. Architects and engineers are taking advantage of our products, which offer structural performance, over 69,000 colors, acoustic sound reduction and solar UV protection that provide safety, security and weight reduction inherent to the PVB when laminated between two pieces of glass.

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