

BirdSecure

Bird proof solutions
with Trosifol[®] and SentryGlas[®]

kuraray

Trosifol[®]

SentryGlas[®]

Introduction

Interlayer strength, depth and capabilities

Delivering your window into the world of advanced interlayers for laminated safety glass, Kuraray's Advanced Interlayer Solutions Division is underpinned by decades of innovation, application knowledge, domain experience and market success.

OUR ADVANCED INTERLAYER PORTFOLIO – comprising Trosifol® Advanced Interlayer Solutions and SentryGlas® ionoplast interlayers – has continually revolutionized aesthetic, structural and functional design, fabrication and installation in the architectural and automotive/transportation segments.

Designed to benefit consumers, society and industry, our products are advancing the functionality of glass, while our engineers and consultants are setting new application benchmarks by collaborating on solutions that both sustain and inspire.

We are committed to helping you transform your mindset and take your applications to the next level – aesthetically, functionally and structurally. Enjoy greater design freedom and give your glazing strength, clarity, character and purpose with solutions that cover safety, security, sound insulation, UV/solar/energy management, color and print.

OUR DIVERSE PRODUCT RANGE, the broadest on the global market and our domain expertise create strength; and we channel this strength into helping you succeed. We strive to be your strongest ally and supporter and will help you navigate and conquer the ever-changing demands of the global glass industry. Worldwide production, R&D and support, means we are always by your side... no matter where you are.

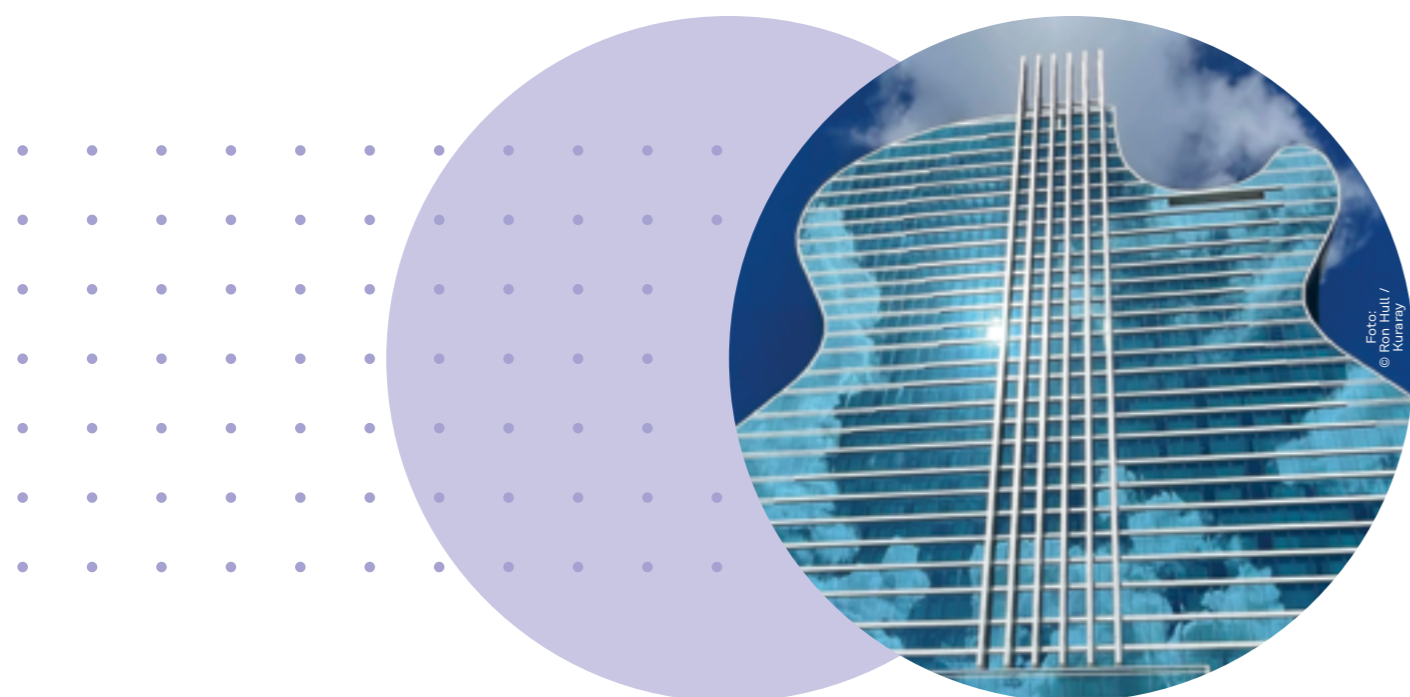


Photo: © SFEID CRACHO/shutterstock.com

Glass in architecture – and its danger for birds

AS THE HUMAN POPULATION GROWS, so does its effect on local flora and fauna. Urbanisation has seen human habitation creeping into areas that were traditionally the realm of wildlife, presenting birds and animals with unfamiliar obstacles and structures, to which many find it hard or impossible to adapt.

With this urbanisation and population growth has come the need for greater population density and more efficient land use and, as a result, buildings have risen in height, often into the flight paths of domestic and migratory species of birds.

This problem is then compounded by the increasing use of glazing in architecture. From skyscraper curtain walls to feature windows in domestic buildings, glass has become an important material for both structural and aesthetic purposes.

Birds do not perceive glass in the way we do. Although it is transparent, we see all the visual cues, such as geometric shapes, frames, mullions and mounts, but to a bird, a modern float-glass panel is an opening or an entrance to a tunnel, it may also reflect vegetation and appear to them as safe passage. They simply don't have the same perception as us.

Urbanisation, habitat encroachment, taller buildings and the wider proliferation of glazing have come together to create a real danger for birds, so we have to be conscious of this in our design exercise.

The following pages represent a potential solution, especially for areas where bird habitats or migratory paths may conflict with modern buildings.

The problem glass

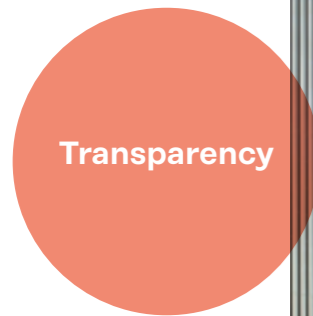
FACTORS THAT ARE DANGEROUS TO BIRDS WHEN USING GLASS



Reflection



Building size



Black hole or Passage effect



Applications for BirdSecure glazing



- 1 • Transparent aerial walkways
- 2 • Plants behind transparent surfaces
- 3 • Transparent noise barriers, glazed entrances or winter gardens with ineffective black silhouettes
- 4 • Glazed balcony walls and balustrades
- 5 • Reflective façades
- 6 • Attractive green spaces in front of reflective façades
- 7 • Transparent building corners

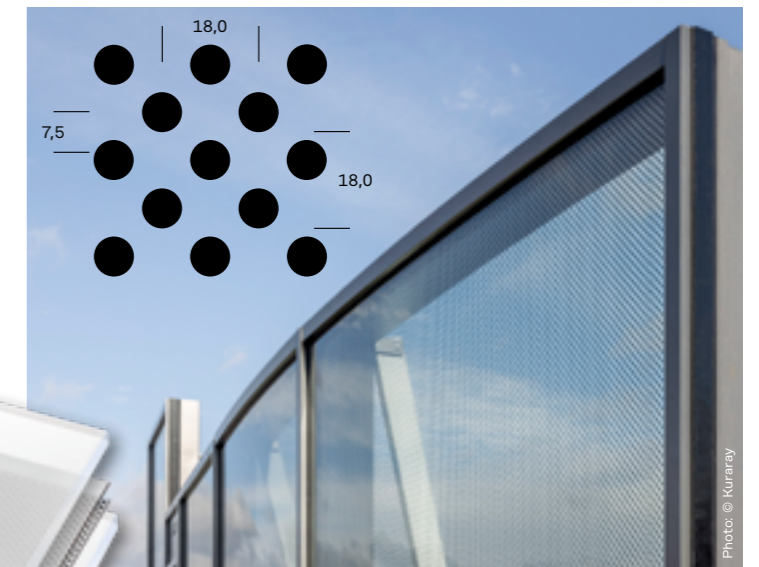
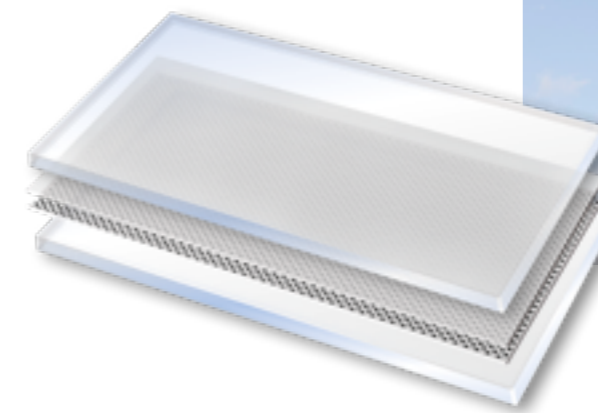
The solution

Trosifol® BirdSecure

- Dot pattern on Trosifol® UltraClear

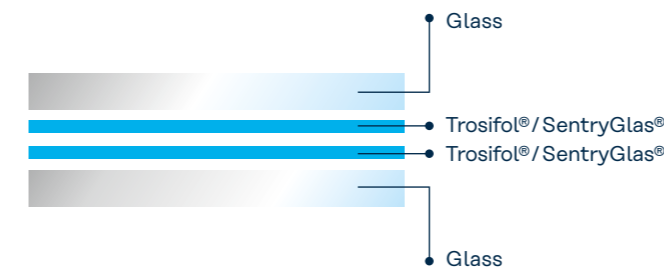
SentryGlas® BirdSecure

- Dot pattern on SentryGlas®

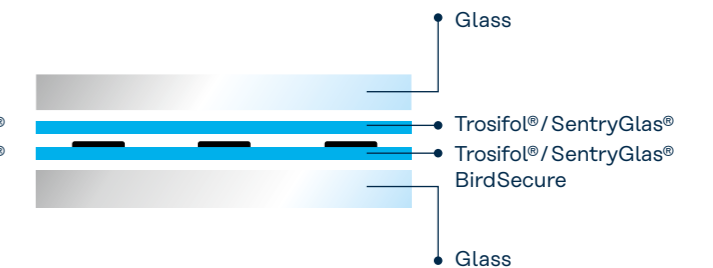


The principle

Laminated safety glass



Laminated safety glass with BirdSecure



Guidelines and characteristics



Handling and Processing Guidelines

- Trosifol® BirdSecure needs to be combined with Trosifol® products
- SentryGlas® BirdSecure needs to be combined with SentryGlas®*
- The pattern may not be facing towards the glass surface (see graphic page 7)
- Products can be laminated in nipp-roll, vacuum bag and autoclave free systems
- In combination with insulated glass BirdSecure needs to be in the outer pane

* Laminate SentryGlas® directly to the tin-side of the glass (an orientation of ATTA - glass airside / glass tin-side / SentryGlas® / glass tin-side / glass airside).

Characteristics of Kuraray BirdSecure

- Outstanding threat level
 - Tested at ABC Bird US
 - No need for own bird testing
 - Monolithic and in combination with solar control coating
- Relevant safety features remain unchanged
 - Culletts are glued to the interlayer in case of glass breakage
- Outstanding optic in combination with BirdSecure
 - From a distance of more than 2 m the dot pattern disappears (see pictures)
- Solar control performance
 - Measured at notified body (Fraunhofer ISE)
 - Calculations can be done using WinSLT or Optics (Berkely Lab) (see table)
- BirdSecure versus screenprinting on glass
 - Faster delivery times (esp. for replacements)
 - Thinner glass combinations
 - Combination with annealed glasses for better optical properties

Physical properties

Design	Light transmittance [%]	Light reflexion outside [%]	g-value [%]	Absorption outer pane [%]	
Monolithic glass					
4 mm - 1.52 mm UltraClear - 4 mm	89	8	78	20	
4 mm - 0.76 mm BirdSecure + 0.76 mm UltraClear - 4 mm	67	6	69	33	
Insulated glass unit with low-E coating					
4 mm - 1.52 mm UltraClear - 4 mm - cavity - 4 mm Low-E	74	16	50	25	
4 mm - 0.76 mm BirdSecure + 0.76 mm UltraClear - 4 mm - cavity - 4 mm Low-E	56	11	41	40	
BirdSecure Solar Control vs. BirdSecure Low-E					
6 mm - 0.76 mm BirdSecure + 0.76 mm UltraClear - 6 mm solar 70/40 - cavity - 6 mm	54	7	33	53	
6 mm - 0.76 mm BirdSecure + 0.76 mm UltraClear - 6 mm - cavity - 6 mm Low-E	55	11	39	44	
BirdSecure tested design including threat-level					
	Threat-Factor [%]	Light transmittance [%]	Light reflexion outside [%]	g-value [%]	Absorption outer pane [%]
Monolithic glass					
6 mm - 0.76 mm Trosifol® BirdSecure + 0.76 mm UltraClear - 6 mm	15	66	6	67	37
6 mm - 0.76 mm SentryGlas® BirdSecure + 0.76 mm SentryGlas® - 6 mm	12	67	6	67	36
Insulated glass unit with Solar control coating					
6 mm - 0.76 mm BirdSecure + 0.76 mm UltraClear - 6 mm 68/33 - cavity - 6 mm	11	52	9	28	52

TAB 1

Testing & technical data

Like anything with Mother Nature, it is hard to ensure that open air testing can cater for every possibility. As a result, broad-area testing regimens can be difficult to set up and run, and they may not produce representative results.

As a result, in-field tunnel testing is a preferred method, as it offers far more controllability, is quicker and cheaper to perform and can be documented far more easily.

The best results have been delivered by a comprehensive testing programme, which commenced in 2006 at a Biology Station in Hohenau-Ringelsdorf in Austria. The location was chosen due to the large varieties of bird species seen in the area throughout the year. Martin Rössler and Wolfgang Laube, the scientists that developed the testing process, have since perfected the system with a removable tunnel which delivers symmetrical lighting.

TESTING CONDITIONS

- Visibility without reflection (ONR-Test)
- Introduction of reflections in front of natural, light backgrounds



Trosifol® BirdSecure and SentryGlas® BirdSecure – Dimensions

Product	Thickness		Roll widths		Roll lengths	
	[mm]	[mil]	[mm]	[in]	[m]	[ft]
Trosifol® BirdSecure	0.76	30	1200/1830/2500	47/72/98	50	164
SentryGlas® BirdSecure	0.76	30	on demand		50	164

TAB 2 • Printing on roll (not only for BirdSafe); other designs and colors are possible

Contact



FOR FURTHER INFORMATION

on products from Kuraray, please visit www.kuraray.com.

You can find further information on our Trosifol® and SentryGlas® products at www.trosifol.com.

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