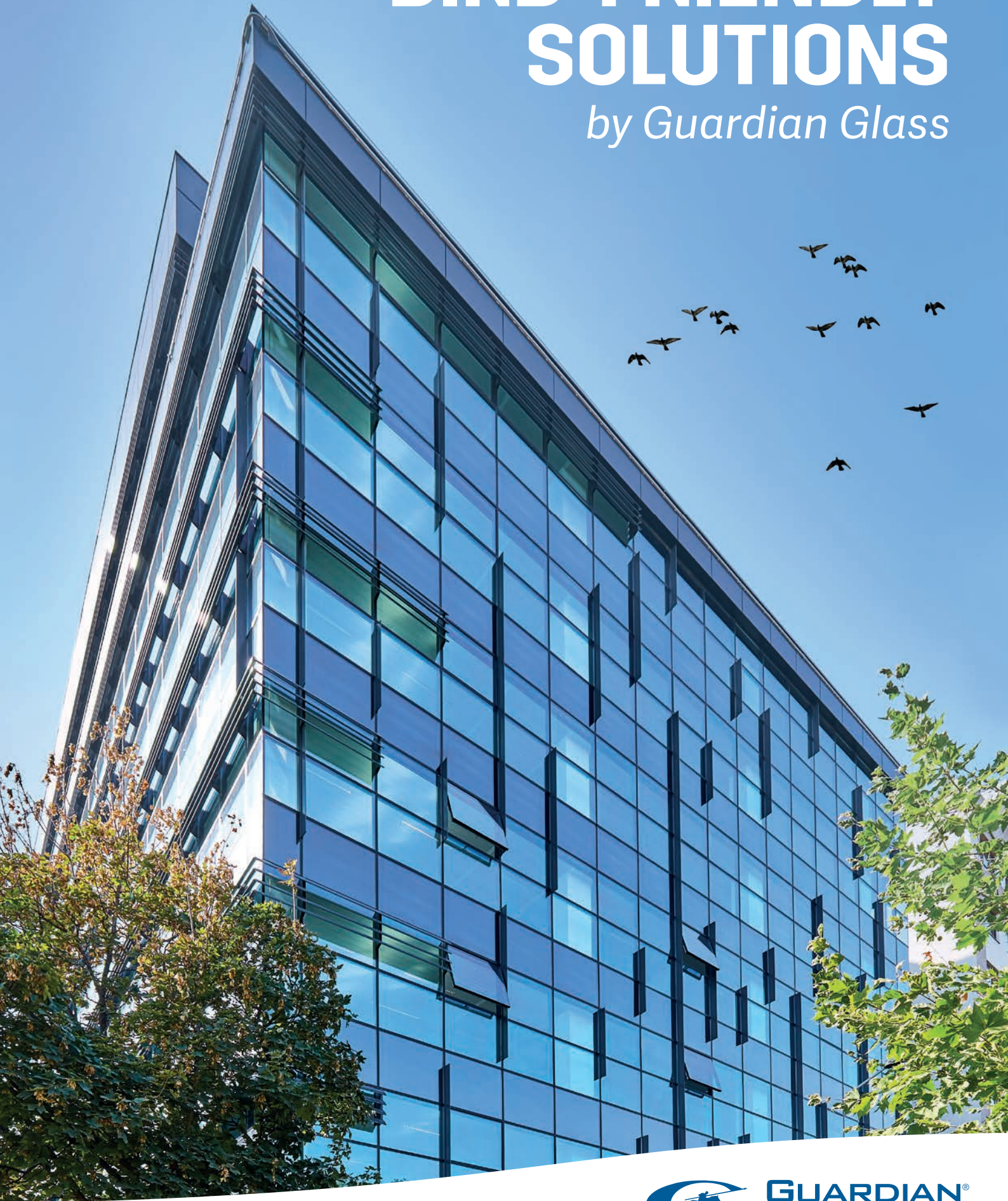


BIRD-FRIENDLY SOLUTIONS

by Guardian Glass



See what's possible™

Each year, millions of birds accidentally fly into glass windows, doors and facades, with many of these collisions being fatal. As glass continues to make up more and more of the external building envelope, it is likely that the number of birds affected by this problem will increase over the coming years. Building requirements are becoming more stringent across the world, which means architects are now looking for glass solutions that are safer and which help to reduce the risk of bird collisions, whilst still providing the aesthetic and performance attributes that their projects require.

Attempts to reduce these types of collisions have included adding visible shapes or printed dots to the glass – with positive results. However, the appearance of the glass suffers when patterns or dots are printed on the glass.

Why do birds collide with glass?

The two most common causes of birds colliding with glass are its transparency and its reflectivity.

Transparency

The transparency of glass is perhaps the most well known cause of bird collisions. The bird sees the tree, the sky or an attractive landscape through the glass and flies directly towards it, colliding with the pane of glass in the process. This danger is increased as the transparency of the glass increases (and size of the glazed area).



Trees, and attractive habitat, free space to fly in and a plate of transparent glass in between: this is the danger for birds.

Reflectivity

Another cause of bird collisions with glass is reflectivity. The type of glazed surface, the light and the environment behind the glass all determine how strongly and how clearly the surroundings are reflected. If a park environment is reflected, the bird may be deceived into thinking it sees a pleasant location. It flies directly towards it, without realising that this is only a reflection in the glass. Reflective surfaces placed in the landscape have the same effect.



Sun-protection glass and many other types of glass have a high reflectivity index. The stronger the reflection and the more attractive the environment reflected, the greater the number of collisions.



Overview of the hazards in a modern development: 1 Bicycle stand in transparent material; 2 Reflective façades (glass, metal, etc.); 3 Trees in front of reflective façades; 4 Attractive green spaces in front of reflective façades; 5 Transparent noise barriers with ineffective black silhouettes; 6 Glazed entrance to the underground parking; 7 Transparent aerial walkway; 8 Reflective façades; 9 Garden sculptures made of reflective or transparent material; 10 Transparent corners; 11 Winter garden; 12 Glass balcony walls; 13 Transparent corners; 14 Plants behind transparent surfaces.

Reducing Reflectivity to less than 15%

The degree of external reflection of glass panes and the design of the surrounding environment are critical. Even moderate levels of reflectivity can pose a danger to birds, particularly when the room behind the glass is dark. Reducing dangerous reflections is a challenge because variable light conditions affect reflectivity. However, choosing glass with a low coefficient of reflection is a step in the right direction.

Ornithologists¹ recommend that in order to reduce the dangers of reflectivity, glass (double or triple glazing) with an **external coefficient of reflectivity of 15% or less** should be installed. Such glazing is not completely safe, but for particularly large surfaces, it is an economically attractive and acceptable solution that does not reduce visibility compared to patterned glass.



Glass with high coefficient of reflection



Guardian glass with low coefficient of reflection

Guardian Glass Solutions

Guardian Glass offers a range of solutions answering bird friendly glass requirements for double and triple IGUs (insulating glass units) with external reflectivity of 15% or less. These solutions provide architects with the good balance between transparency and reflectivity. Compared to traditional glass solutions that utilise printed dots or visible shapes, Guardian glass solutions provide architects with high performance, optimal light transmission and clear views of the outside environment. Furthermore, these glass solutions offer enhanced aesthetics that are consistent with the rest of the glazed façade, with no additional surface treatment required or costs involved. This means architects do not have to compromise on the appearance of the glass when choosing bird-friendly solutions.

Guardian SunGuard® products

Guardian Glass offer a range of products within its SunGuard portfolio that meet the requirement for bird friendly glass.

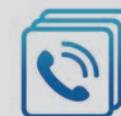
	Visible light				Solar energy			Solar factor (g) EN 410 [%]	U-Value (EN 673) Argon 90% [W/m²K]
	Trans-mission [%]	Reflection outside [%]	Reflection inside [%]	Colour rendering index	Direct trans-mission [%]	Reflection outside [%]	Absorption [%]		
Double Glazing 6-16-4, coating on surface #2									
SNX 50	50	10	13	90	22	36	42	24	1.0
SN 70S	70	11	13	95	37	38	25	39	1.0
SN 70/37	70	11	12	93	35	39	26	37	1.0
SN 63	63	12	16	92	31	37	31	33	1.0
Triple Glazing 6-16-4-16-4, coating on surface #2, Guardian ClimaGuard® Premium2 on surface #5									
SNX 50	45	11	16	89	19	37	44	22	0.5
SN 70S	64	14	17	93	32	40	29	36	0.5
SN 70/37	63	14	16	92	30	40	30	34	0.5
SN 63	57	14	19	91	27	38	34	31	0.5

The performance values shown are nominal and subject to variations due to manufacturing tolerances. Spectra-photometric values according to EN 410; U-values according to EN 673. All products in the glazing use Guardian ExtraClear® base glass.

Guardian System TEA (True Edge Application)

For higher requirements, a marking can be applied at least on surface #2 of the glazing. An ideal solution for this is the enamel Guardian "System TEA" for ceramic printing of black marks directly onto the coating. As this enamel dissolves the coating (and its reflection) a maximum contrast can be achieved when looking from outside on the glass.

Further help:



The needs and requirements of every project are unique. If you are interested in learning more about bird-friendly glass solutions or discuss the needs of your project, please contact your local Guardian Glass expert or write us at information@guardian.com

¹ "Bird-Friendly Building with Glass and Light", Hans Schmid, Wilfried Doppler, Daniela Heynen & Martin Rössler (Swiss Ornithological Institute Sempach, 2013).



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Product: Guardian SunGuard® SN63

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