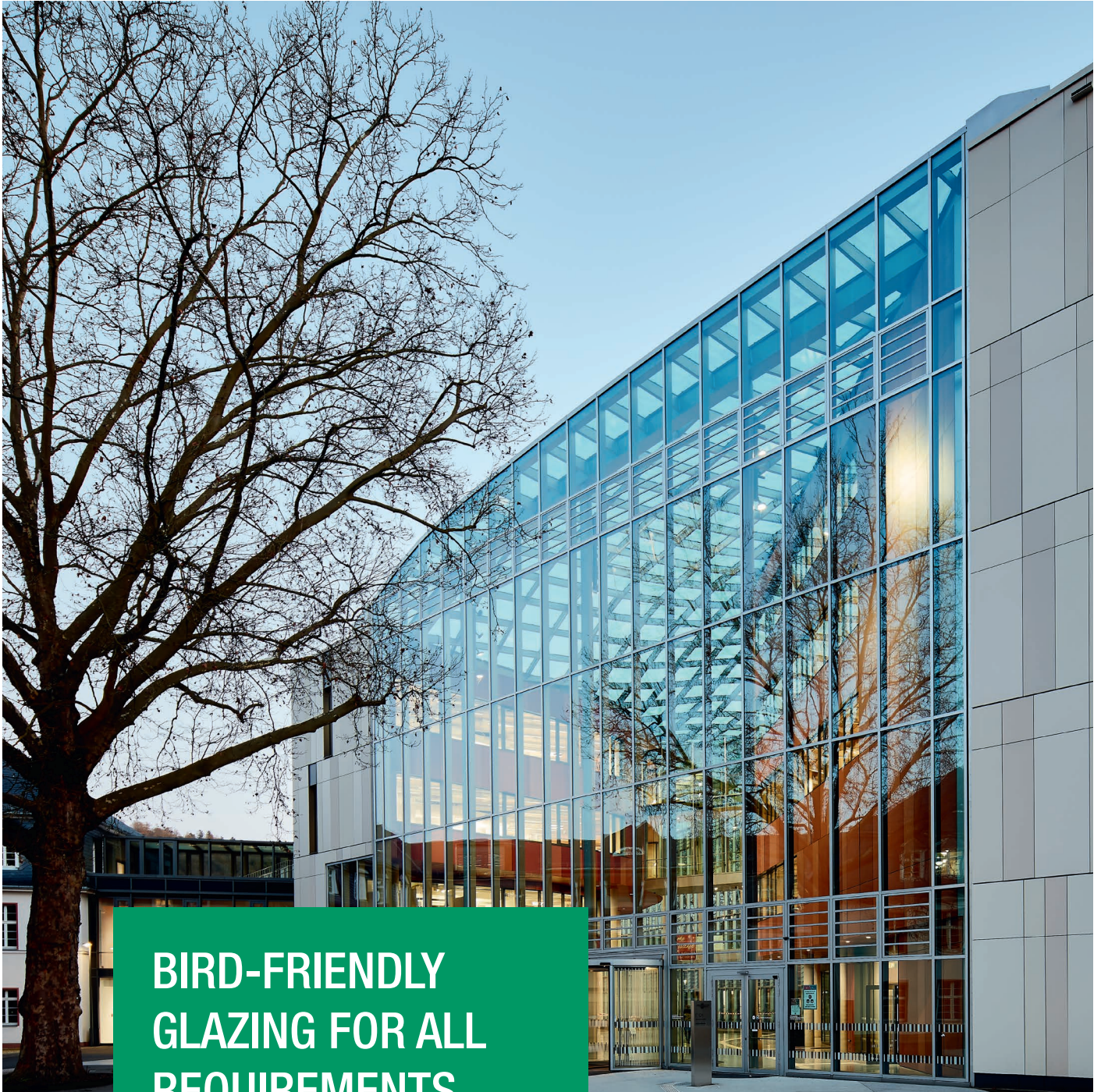




ISOLAR
ORNILUX®



**BIRD-FRIENDLY
GLAZING FOR ALL
REQUIREMENTS**

ISOLAR®
GLAS

MEHR AUS GLAS

EVERY YEAR, SEVERAL HUNDRED MILLION BIRDS WORLDWIDE DIE AND ARE INJURED DUE TO COLLISIONS WITH GLASS SURFACES OF BUILDINGS. ORNILUX® IS A CERTIFIED SOLUTIONS FOR BIRD-FRIENDLY BUILDINGS.

■ REDUCE BIRD STRIKE WITH ORNILUX®

The reason for collisions of birds with glass surfaces are the reflective and transparent properties of glass. The animals find it very difficult to recognise windows and façades and therefore are sometimes unable to avoid the obstacle. In addition to the destruction of their habitat, bird collisions are a major factor for the decline in bird populations worldwide.

Thanks to the increasing environmental awareness in the building industry, architects, planners, investors and builders are increasingly facing up to the responsibility of sustainable, "green" architecture. This does not contradict the func-

tionality, efficiency and aesthetics of modern architecture. As a pioneer in the development of transparent bird protection solutions, Arnold Glas began to address the problem of bird strike with scientific solutions as early as 2003. The know-how and extensive experience has resulted in a product family that offers different solutions depending on the different requirements.

Just as standard insulating glass units ORNILUX® can be installed in all window and facade systems. The coating makes the difference and can additionally be combined with other functions such as sound and heat insulation as well as solar control is possible without any problems.



Mountain station Karwendel, Mittenwald Germany

■ CERTIFIED SOLUTIONS

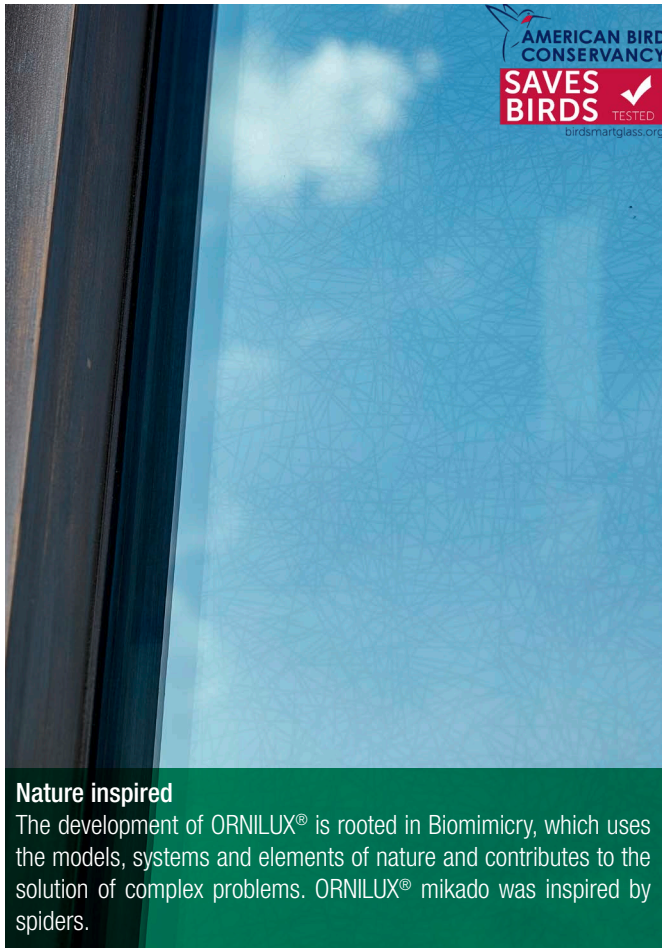
Since the beginning all ORNILUX® glass products have been tested for their effectiveness in so-called flight tunnel tests. We work with test facilities in Austria and the USA. There are no international standards for these tests yet, but the basic principle does not differ between the various countries: a statistically meaningful number of test birds fly through a flight tunnel. At the end of the tunnel there are two glass elements installed. One test unit and the reference unit without the bird protection coating. To ensure that the birds are not harmed and can be released back into the wild after the test flight, there is a net in front of the panes. Depending on how many animals avoid the test pane, the effectiveness of the glass can be determined based on the defined rating scale of the test facility.

■ FOR EVERY NEED

In order to offer birds optimum protection and still allow flexible designs, there are various ORNILUX® solutions. Both the transparent coatings ORNILUX® mikado and the ORNILUX® design pattern in elegant metallic design, enable versatile architectural freedom for different facade concepts. The area of application and the possibilities are the same for the entire ORNILUX® product family: You can design entire facades, individual (roof) windows, conservatories, balcony glazing and animal enclosures to be bird-friendly. Depending on the application, you can choose between insulating glass units and laminated or monolithic safety glass.

■ TRANSPARENT COATING OR ELEGANT DESIGN

ORNILUX® mikado is hardly visible to the human eye, as the reflection of this special coating is predominantly in the ultraviolet range. Unlike humans, many birds are able to perceive UV light thanks to an additional cone on their retina. This helps the birds to recognise the glass as an obstacle in time and to fly around it. Besides **ORNILUX® mikado**, which is applied toward the cavity of the insulating glass unit, we also offer the modified version **ORNILUX® mikado one**, a coating on the outer surface of the glass, which structure interrupts the reflections occurring on the outside.



Nature inspired

The development of **ORNILUX®** is rooted in Biomimicry, which uses the models, systems and elements of nature and contributes to the solution of complex problems. **ORNILUX® mikado** was inspired by spiders.

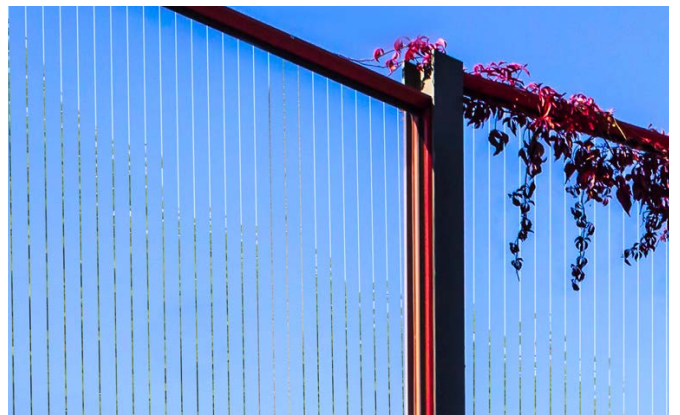
The filigree, spider web-like appearance of **ORNILUX® mikado** is barely perceptible to the human eye. It has been tested and certified by the American Bird Conservancy in Pennsylvania/USA.

Bird-friendly architecture involves an overall concept that takes into account not only the use of bird-friendly glass, but also the actual building design with the surrounding environment and landscaping.

In contrast to our transparent solutions, **ORNILUX® design** is clearly visible to humans and animals. Here, for the first time, a new coating process is used which complements the screen printing process used to date and is based on visible, metallic markings in the form of dots or lines. The chrome markings create maximum contrast in both reflection and transmission and are used usually when bird protection is to be combined with an attractive and exclusive design. This provides highly effective bird protection on the outer glass surface.



Thanks to the seamless design of **ORNILUX® design dots**, there is no additional waste.



ORNILUX® design lines. The high effectiveness of **ORNILUX® design markings** has been confirmed by tests in the Hohenau-Ringelsdorf/Austria flight tunnel.

Even though tested bird-friendly glass products contribute significantly to the reduction of bird strikes, a complete prevention of bird collisions is not achievable.

BIRD-FRIENDLY GLASS – THE MOST IMPORTANT ADVANTAGES

- Reduction of bird strike
- Flexibility through a wide range of tested products
- No compromises in energy efficiency and other technical properties
- Design freedom for architects and developers by using identical performance coatings in areas with bird protection requirements and other areas without increased bird strike risk

TECHNICAL DETAILS AT A GLANCE

ORNILUX® mikado & ORNILUX® mikado one

Product name	Glass construction Outer/Cavity/Mid/Cavity/Inner	EN 673	EN 410					EN ISO 717-1	Thick-ness mm	Weight kg/m ²
		U _a -Value	Light Transmission	g-Value	Light Reflection external	Light Reflection internal	Colour Rendering Index R _a	Sound insulation R _w / C / C _r		
		W/(m ² K)	%	%	%	%		dB		
ORNILUX® mikado / ¹⁾	66.2	5,4	84	74	11	11	98	36	13	30
ORNILUX® mikado / ¹⁾	444.22	5,3	84	73	11	11	98	-	13	30
ORNILUX® mikado / ¹⁾	121212.22	4,7	77	60	10	10	94	-	37	90
ORNILUX® mikado uno // 1,0	6 / 16 / :44.2	1,0	66	47	24	25	96	39 / -2 / -6	30	35
ORNILUX® mikado advance // 1,1	4 / 16 / :44.2	1,1	77	61	15	14	98	38 / -2 / -7	28	30
ORNILUX® mikado A71 // 66.37	6 / 16 / :44.2	1,0	66	36	15	17	96	39 / -2 / -6	30	35
ORNILUX® mikado A61 // 58.32	6 / 16 / :44.2	1,0	58	32	14	15	93	39 / -2 / -6	30	35
ORNILUX® mikado A51 // 51.26	46.2: / 16 / :4	1,0	51	26	16	12	91	-	30	35
ORNILUX® mikado A40 // 41.22 ²⁾	46.2: / 16 / :4	1,0	41	22	23	11	91	-	30	35
ORNILUX® mikado advance /// 0,6	4 / 14 / :4 / 14 / :44.2	0,6	70	51	17	17	97	-	44	40
ORNILUX® mikado A71 /// 60.33	6 / 14 / :4 / 14 / :44.2	0,6	60	33	17	18	95	-	46	45

ORNILUX® mikado one coating (zoomed pattern design as tested with ABC in 2020) can be used on surface 1 (bird approach side) in lieu of original mikado coating, that is usually placed to face 2 or 3 within the insulating glass. This is valid for all tested and approved ORNILUX® mikado configurations.

ORNILUX® design

ORNILUX® design dots / ³⁾	:6	5,7	89	85	8	8	99	31	6	15
ORNILUX® design lines / ³⁾	:66.2	5,4	83	73	11	10	98	36	13	30
ORNILUX® design dots // 1,1	:4 / 16 / :4	1,1	81	64	12	12	98	32	24	20
ORNILUX® design lines // 1,1	:4 / 16 / :4	1,1	78	62	14	13	98	32	24	20
ORNILUX® design dots /// 0,6 ⁴⁾	:4 / 14 / :4 / 14 / :4	0,6	74	55	15	14	97	32	40	30
ORNILUX® design lines /// 0,6 ⁴⁾	:4 / 14 / :4 / 14 / :4	0,6	71	53	17	16	97	32	40	30

1) Technical data for monolithic superstructures are approximate. ORNILUX® mikado coating on level 2 and 5. 2) Outer pane is thermally toughened (toughened safety glass). 3) These ORNILUX® design constructions were successfully tested in the flight tunnel test in Hohenau-Ringelsdorf/Austria with markings on level 1. Further information on request. 4) Middle pane with additional low-e coating is thermally toughened (toughened safety glass). | All ORNILUX® mikado multi-pane constructions have achieved an approach rate of at least 70% to the control pane in ABC flight tunnel tests („EFFECTIVE“ category). More information at www.birdsmartglass.org. The flight tunnel results form the basis for LEED Credit 55. www.usgbc.org. ORNILUX® is the world's first bird-protection glass that has been proven in extensive tests by recognised institutes in Germany and the USA to improve bird perception. It can be used like conventional glass. Other combinations on request. See also ISOLAR® Compass 4/2021: Bird protection glass (www.isolar.de/en).

AVAILABILITY AND COMBINATIONS:

- Available on basic float, fully toughened glass, heat strengthened glass and laminated safety glass
- All constructions available as alarm glass

CLEAR BENEFITS WITH ISOLAR®

ISOLAR® is one of the largest associations of independent insulating glass manufacturers in Europe with members from twelve countries. Thanks to the close cooperation within the group, our products are constantly optimised and new developments are driven forward. You will find an ISOLAR® partner in your area as well, who will support you as an experienced full-range supplier with comprehensive consulting expertise and who will supply you with high-quality functional glass for windows and façades.



Heat insulation



Solar control



Bird protection



Design



Fire protection



Radio transparency



Sound insulation



Attack resistance



Safety glass



Fall protection

WE'RE HERE TO HELP.

ISOLAR Glas Beratung GmbH is your competent partner when it comes to glass. We turn your wishes into clear solutions. Ask us.

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www.isolar.de/en

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