



# MORE TRANSPARENCY AND BIRD PROTECTION.

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# ISOLAR ORNILUX® – THE SOLUTION FOR BIRD PROTECTION.

Every year, several hundred million birds die by striking glass surfaces. The reflective, transparent properties of glass make windows and façades a real danger for birds because they don't always recognise the hazard in time. Bird strike is a critical factor in the worldwide decline in the bird population - it comes in second behind destruction of natural habitats.

## LIGHT TRANSPARENCY IN HARMONY WITH NATURE.

Using glass from the product family ISOLAR ORNILUX®, the glass processors Arnold Glas have developed products, which deal with the problem of bird strikes with scientific solutions.

ISOLAR ORNILUX® mikado, for example, comes with a special UV reflective coating. The coating is not applied to the whole surface, but only partially in a form like the children's game Mikado. Birds can recognise this structure, because they can see part of the UV range. But for humans, this coating is almost invisible. This means architectural transparency and bird protection are no longer mutually exclusive.

## ANCHORING SUSTAINABILITY AND ENVIRONMENTAL RESPONSIBILITY IN ARCHITECTURE.

Arnold Glas is a pioneer in the development of transparent bird protection solutions, with many years of experience and expertise. As far back as 2003, they developed a test method for proving the effectiveness of various prototypes compared to conventional panes of glass, in collaboration with Radolfzell Bird Observatory. Since 2010, over 120 prototypes have been tested in flight tunnel experiments in Rybachy, Russia and Powdermill, USA, many of which were successful. Some designs were even categorised as "Effective" by the American Bird Conservancy (ABC), due to their test results.



"Green Building" has become a buzzword in the construction industry. Consideration of bird protection measures has also been reflected in "green thinking" in architecture, and shows that architects, planners, investors and building companies accept the responsibilities associated with constructing modern buildings. Functionality, efficiency and aesthetics do not have to oppose life sustaining architecture.



Polar bear enclosure Hellabrunn Zoo, Munich, built with ISOLAR ORNILUX® mikado mono  
Photo: © Arnold Glas



Südsternwarte Observatory Garching, built with ISOLAR ORNILUX® mikado // Photo: © Arnold Glas

## SPECIAL FUNCTION, SIMPLE INSTALLATION.

Just like other insulating glass or laminate safety glass, ISOLAR ORNILUX® glass can be installed without particular technical requirements or special tools. Applications include large-scale façades and window fronts, glass constructions, winter gardens, glazing in animal enclosures, plus noise or flood protection systems made of glass. The glass is easy to combine with other functions such as heat insulation or sound reduction, as well as solar control.

## OTHER GLASS IN THE ORNILUX® FAMILY OF PRODUCTS.

Glasses in the ISOLAR ORNILUX® screen-print series feature tested colour screen print markings. This means the markings fulfil an artistic role at the same time.

You can get more information about ISOLAR ORNILUX® bird protection glass and its use in your individual application from your local ISOLAR® partner or at [www.isolar.de](http://www.isolar.de).



Private house in Waldesch, built with ISOLAR ORNILUX® mikado // Photo: © Arnold Glas

## ISOLAR ORNILUX® BIRD PROTECTION GLASS

### ISOLAR ORNILUX® mikado mono

Glass type	Glass assembly	U <sub>g</sub> (DIN EN 673) in W/m <sup>2</sup> K	Light transmission (DIN EN 410) in % (± 2)	Light reflexion (DIN EN 410) in % (± 2)	Solar factor g value (DIN EN 410) in % (± 2)	Thick- ness <sup>****</sup> mm	Weight <sup>****</sup> kg/m <sup>2</sup>
mono	VG 4: / 4 / :4	5,3	84	11	71	13	30
mono	VG 12: / 12 / :12	4,7	76	10	57	37	90

### ISOLAR ORNILUX® mikado uno

// 1,0	✓	6: / 16 / :VSG 44.2	1,0	66	24	47	30	35
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### ISOLAR ORNILUX® mikado advance 34

// 1,1	✓	4: / 16 / :VSG 44.2	1,1	77	15	61	28	30
/// 0,6	✓	4: / 14 / :4 / 14 / :VSG 44.2 <sup>*)</sup>	0,6	70	18	52	44	40

### ISOLAR ORNILUX® mikado

A70 // 66.36	✓	6: / 16 / :VSG 44.2	1,0	66	16	36	30	35
A60 // 58.32		6: / 16 / :VSG 44.2	1,0	58	16	32	30	35
A50 // 51.26	✓	VG 46.2: / 16 / 4 <sup>**)</sup>	1,0	51	19	26	30	35
A40 // 41.22	✓	VG 46.2: / 16 / 4 <sup>**)</sup>	1,0	41	23	22	30	35
A70 /// 60.33	✓	6: / 14 / :4 / 14 / :VSG 44.2	0,6	60	17	33	46	45
A60 /// 53.29	✓	6: / 14 / :4 / 14 / :VSG 44.2	0,6	53	17	29	46	45
A50 /// 45.25		6: / 14 / :4 / 14 / :VSG 44.2	0,6	45	20	25	46	45
A50 /// 46.24		VG 66.2: / 14 / 4 / 14 / :4 <sup>**)</sup>	0,6	46	20	24	48	50

✓ These types of ISOLAR ORNILUX® glass reached an approach flight rate of at least 70% to the control pane in ABC flight tunnel tests ("EFFECTIVE CATEGORY"). Find more information at [www.birdsmartglass.org](http://www.birdsmartglass.org). The "ABC Glass Collisions Program" is a reliable source for assessments of various glass products, or the hazard factors for birds. The flight tunnel results form the basis for the LEED Pilot Credit 55. [www.usgbc.org](http://www.usgbc.org).

The types and values above are based on information in the ISOLAR® programme as at 01/2017. Please consult the latest version in each case! For better comparability of U<sub>g</sub> values all double insulating glass types are listed with cavity of 16 mm (Argon), all triple insulating glass types are listed with cavities of 2 x 14 mm (Argon). All ISOLAR ORNILUX® bird protection insulating glass can be fitted with thermally enhanced edge seal system (Warm Edge) on request. The performances indicated correspond to the relevant, applicable test norms and legal directives, and the test measurements and conditions required or described there. The values indicated refer exclusively to the glass elements. The values for other components depend essentially on the frame construction. U<sub>g</sub> values are calculated in accordance with DIN EN 673 based on vertical installation. Due to the tolerance of entry parameters, a deviation from the calculated values of up to 0.1 W/m<sup>2</sup>K is possible.

Every individual type of new glass must be tested for effectiveness in a "flight tunnel". Therefore, there may be a difference from the flight approach rate from the tested assembly where there is a deviation in the glass assembly with regard to glass thickness and cavity width.

\*) Middle pane is thermally toughened | \*\*) Outer pane is thermally toughened | \*\*\*) Tolerance depending on type

# Clear Benefits with ISOLAR® GLAS.

ISOLAR® GLAS is the insulating glass brand of the ISOLAR® GLAS group. It stands for continually high quality and a high level of safety in product application. This is guaranteed by a comprehensive, three-stage quality system: This includes our own factory production control of manufacturing companies as well as external monitoring by the ISOLAR® GLAS group and independent bodies.

As one of the biggest associations of independent manufacturers of insulating glass in Europe, the ISOLAR® GLAS group is made up of companies in ten different countries. Thanks to close cooperation within the group, customers always have an ISOLAR® GLAS partner nearby, who can offer their support as a highly-competent service provider with a comprehensive range of consulting services.

Every member of the ISOLAR® GLAS group specialises in the manufacture and processing of flat glass. This means they can demonstrate an extraordinarily wide range of products for the sector. In addition, they can produce bespoke solutions for individual projects in ISOLAR® GLAS quality. The portfolio contains ten product groups, covering the various functional areas, whose properties can be combined with each other.

Everything at a clear glance:

- High quality products, complete range
- Quality system via internal and external monitoring
- Advisory expertise in all aspects of glass
- Flexibility of a medium-sized organisation
- Decentralised structure, short lead times



-  Heat insulation
-  Sound reduction
-  Solar control
-  Burglary protection
-  Safety glass
-  Fire protection
-  Bird protection
-  Vacuum heat technology
-  Light optimisation
-  Aesthetic design

## We'll be happy to advise you.

The ISOLAR® GLAS group is your competent partner when it comes to glass. We turn your requests into clear solutions. Just ask us.



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