



ISOLAR NEUTRALUX®

**The insulating glass
for more light and heat**



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GLAS**

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www.isolar.de

The insulating glass for more light and heat

NEUTRALUX® advance is the high-performance, heat insulating glass from **ISOLAR®**. It works according to three very simple principles:

→ One of the glass surfaces facing the cavity is provided with an extremely fine, barely perceptible coating. In cold weather, elemental silver in the coating prevents the loss by radiation of heat from the warm, interior pane of the heat-insulating glass to the cold exterior pane almost entirely.

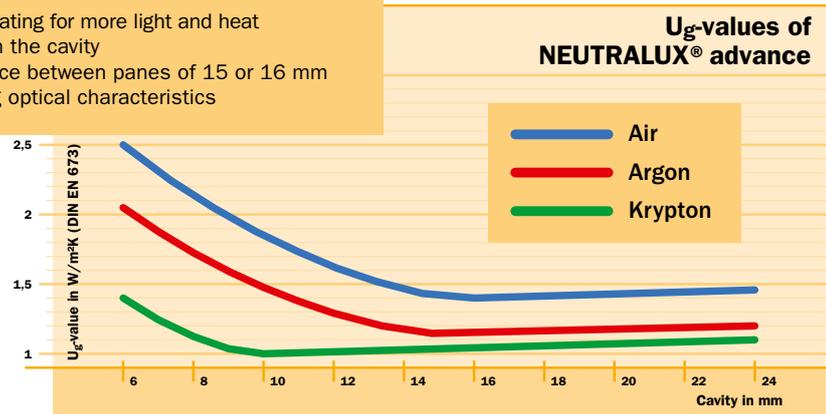
→ The cavity is filled with a noble gas (argon or krypton) which conducts heat less easily than air.

→ Choosing an optimum distance between panes depending on whether the filling is with air or noble gas further reduces the heat loss.



ISOLAR NEUTRALUX® Assembly and features

- 1) High-tech coating for more light and heat
- 2) Gas filling in the cavity
- 3) Ideal distance between panes of 15 or 16 mm
- 4) Outstanding optical characteristics

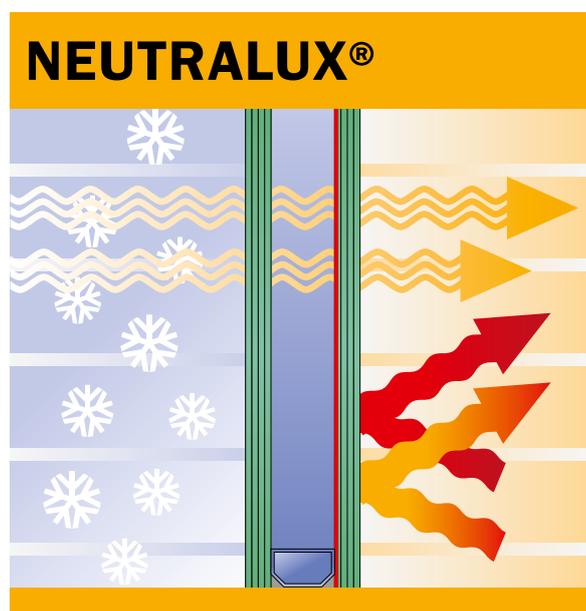


Thanks to the heat-insulating effect of **NEUTRALUX® advance**, the U_g-values as a measure of the heat loss, in comparison with insulating glass fabricated to older standards, at 3.0 W/m²K is more than halved.

The sun makes its contribution

NEUTRALUX® advance takes care of maximum light and comfort. Here too, the coating is the key. The silver for the heat insulation on its own would work like a mirror in the visible light spectrum. This is why it is concealed in a “coating package”. This way the coating is barely perceptible to the human eye. The visible success: **NEUTRALUX® advance** allows almost as much light to pass as an insulating glass without coating.

The coating package makes **NEUTRALUX® advance** a very versatile product. It is assembled so that as much infrared solar radiation as possible can pass through. So the sun provides additional heating free of charge. The solar factor indicates the percentage of solar radiation, that can be used behind **NEUTRALUX® advance**.



Preserving the environment with modern glazing technology

The symptoms of global warming and the far-reaching effects of climate change are impossible to overlook. Better climate protection is top of the agenda all over the world. In 2007 Al Gore even received an Oscar for his admonitory documentary, „An Uncomfortable Truth“ The European Union has decided to cut greenhouse gas emissions by 2020 by at least 20 % in comparison with the 1990 level.

Since 1990 energy consumption in Europe has increased by another 10 %. Consequently, industrial growth and more individual prosperity have been bought at the expense of consuming more power. During the same period in Germany, energy consumption stagnated. At the same time, in Germany alone an estimated 20 million apartments are still waiting for a sustainable energy renovation, with an overall window surface that is the equivalent of more than 15 years production at current rates of insulating glass - a gigantic challenge! In Europe an estimated several billion m² of window surface are waiting for renovation.

Saving energy with glass

Not only new buildings require efficient utilisation of costly energy. Practically all insulating glasses and windows which were installed before 1995, in Germany for example, are outdated in energy terms. Simply replacing old insulating glass by modern **NEUTRALUX®** heat-insulating glass saves the owner's budget and the environment the equivalent of something like 15-20 litres consumption of fuel oil per m² of glass per year. Completely replacing the windows in older dwellings with single glazing reduces the consumption of heating energy by more than twice as much. See for yourself what contribution to energy-saving and to climate protection by lowering „greenhouse gases“ such as carbon dioxide (CO₂) and sulphur dioxide (SO₂), simply changing the glass in a detached house with some 20 m² of glass can achieve every year:



	U _g -value in W/m ² K	Consumption of heating oil in l	Emission of CO ₂ in kg	Emission of SO ₂ in kg
Old insulating glass	3,0	about 700	about 1800	about 2,65
NEUTRALUX® Insulating glass	1,1	about 250	about 650	about 1,0
Economy		about 450	about 1150	about 1,65



← Documentation and Information Centre at the Bergen-Belsen Memorial, Built with: **NEUTRALUX® advance** // Photo: © Arnold Glas

Sports pavilion,
Pfalzgrafeweiler
Built with:
NEUTRALUX®
advance //
Photo: © Arnold Glas



The motto is promote and encourage

In many countries in Europe there is legislation or directives making direct demands on the energy quality of windows and facades. They all implement the European Union's „Energy Efficiency Directive“. In parallel, a multitude of programmes systematically promote the replacement of glass and windows as part of renovation to save energy. In Germany these are in particular:

- Low-interest loans from the KfW [State Investment and Development Institution]
- Direct state grants for renovation leading to energy savings
- Tax incentives for craftsmen's services

These promotional measures make protecting the climate by house renovation to save energy interesting and affordable for everybody. Replacing glass and windows makes an important contribution to this aim.



ISOLAR NEUTRALUX® Heat insulating glass

Glass type NEUTRALUX®		Glass assembly	U _g (DIN EN 673) ΔT = 15K in W/m²K				Light transmission in % (± 2) (EN 410)		Solar factor, *) g-value in % (± 2) (EN 410)			Light reflexion outside in % (± 2) (EN 410)	
advance //	uno //		advance //		uno //		advance //	uno //	advance //	uno //		advance //	uno //
			Ar	Kr	Ar	Kr				Ar	Kr		
1,1	1,0	4/15-16/:4	1,1	1,0	1,0	1,0	80	70	62	50		14	22
1,3	1,2	4/12/:4	1,3	1,0	1,2	0,9	80	70	62	50		14	22
	uno ///				uno ///			uno ///		uno ///			uno ///
	0,4	4:/12/4/12/:4			0,7	0,4		55		35			32
advance ///	ensolar ///		advance ///		ensolar ///		advance ///	ensolar ///	advance ///	ensolar ///		advance ///	ensolar ///
0,5	0,6	4:/18/4/18/:4	0,5	0,5	0,6	0,6	72	70	51	60	60	20	18
0,6	0,7	4:/16/4/16/:4	0,6	0,5	0,7	0,6	72	70	51	60	60	20	18
0,6	0,7	4:/14/4/14/:4	0,6	0,5	0,7	0,6	72	70	51	60	60	20	18
0,7	0,8	4:/12/4/12/:4	0,7	0,5	0,8	0,6	72	70	51	60	60	20	18
0,8	0,9	4:/10/4/10/:4	0,8	0,5	0,9	0,6	72	70	51	59	60	20	18
1,0	1,1	4:/8/4/8/:4	1,0	0,6	1,1	0,7	72	70	51	59	60	20	18
advance light ///	ensolar light ///		advance light ///		ensolar light ///		advance light ///	ensolar light ///	advance light ///	ensolar light ///		advance light ///	ensolar light ///
0,5	0,6	3:/18/2/18/:3	0,5	-	0,6	-	73	73	52	62		20	17
0,6	0,6	3/18/:3/18/:3	0,5	-	0,6	-	72	73	53	65		19	17

Other types on request. Dimensions as per respective, valid price list. The suffix advance, uno or ensolar refers for the coating.

Type key: Numeral 1 = U_g-value (DIN EN 673, ΔT = 15K, in W/m²K)

*) value depends on the position of the coating(s).

Gas-fill level: with argon filling 90%, with krypton filling 95%

On request all ISOLAR NEUTRALUX® heat-insulating glass can also be fitted with thermally improved edge seal system (warm edge). The above-mentioned types and values are based on the specifications in the ISOLAR® 2015 programme. Please see the most recent issue! For the production of ISOLAR NEUTRALUX® light /// thermally toughened glasses are required. The indicated performances have been determined according to the relevant test standards and legal rules for the test dimensions and test conditions required or described therein. Deviating dimensions and combinations as well as glass thickness adjustments resulting from static requirements, for example, may lead to changes in individual characteristics. Indicated values only refer to glass elements. The performances of building elements depend to a large extent on the construction of the frame. Ug values are calculated according to DIN EN 673 for vertical installations. Due to tolerances of input parameters, a deviation of up to 0,1 W/m²K from calculated value is possible. Please also note our Technical Data Sheet!

NEUTRALUX® – The best of ISOLAR®

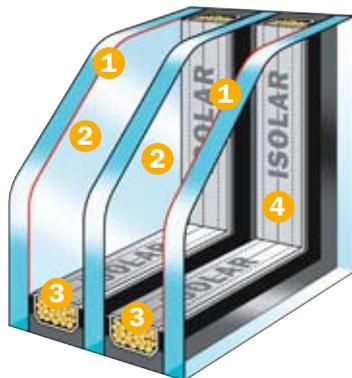
The positive features of NEUTRALUX®:

- Keeps the heat in the room and the cold outside
- Benefits both the environment and your pocket
- Takes care of a comfortable indoor climate
- Utilises the sun for light and warmth
- Quality and safety thanks to quality control by **ISOLAR®**

Energy-saving at the highest level

The most important step towards more heat insulation and higher energy-savings is triple heat-insulating glass. Two cavities, each with a highly heat-insulating coating, ensure U_g values decidedly below $1,0 \text{ W/m}^2\text{K}$.

NEUTRALUX® ensolar /// und **NEUTRALUX® advance ///** represent **ISOLAR's** strongest duo when it comes to comfort and energy-saving at the highest level. Both are the right glazing for housing design with heat losses way below the current legal requirements for efficient energy management. Depending on orientation and size of glass areas, the extensive product range allows adaptation to optimise solar gains in each individual case. **NEUTRALUX® ensolar ///** contains a coating that has been specially developed for use in triple heat-insulating glass. Using it, **NEUTRALUX® ensolar ///** achieves solar factors which otherwise would only be possible with double glazing assemblies.



ISOLAR NEUTRALUX® – Triple heat insulating glass Assembly and features

- 1) High-tech coating for more energy efficiency
- 2) Gas filling in the cavities between panes
- 3) ISOLAR® edge seal system
- 4) Outstanding optical properties



← Gletschergarten
Restaurant, Zugspitze
Built with:
**NEUTRALUX®
advance ///**
Photo: © Arnold Glas

More home comfort with NEUTRALUX®

The better the heat insulation of an insulating glass, the warmer is its interior surface. This means that what one perceives as an unpleasant cold draught near to cold surfaces is drastically reduced. So **NEUTRALUX®** improves the feeling of comfort and contributes to a better utilisation of space.

Also the formation of condensation on the interior pane is a result of the surface temperature. This is where **NEUTRALUX®** ensures that condensation on the interior window surfaces in general only continues to form in particular situations, e.g. in damp rooms.

Water provides evidence

The transition point between glass and frame is the thermal weak point of every window. This might be noticeable by condensation in the edge region of the insulating glass, above all in the lower edge region, where there is a lack of convection in the window reveal. **NEUTRALUX®** with thermally improved edge seal – e. g. with a spacer of stainless steel or with a core made of plastic – reduces the frequency with which this

condensation forms. This way, what is known as the window's "Psi-value" improves. This describes the thermal characteristics at the transition between glass and frame. A lower "Psi-value" means a better U-value for window and facade.

On request all **ISOLAR NEUTRALUX®** heat-insulating glass can also be fitted with thermally improved edge seals. The **ISOLAR®** partner in your vicinity will give you professional support when choosing the right glass type and the optimum edge seal for your requirements.

A result of quality

On clear nights particularly, the exterior surfaces of heat-insulation glass in open areas can cool down considerably. As a consequence "dew" may form on the outer surface which disappears when the pane heats up again in the morning. This phenomenon is not some kind of defect, in fact it is a sign of outstanding heat insulation, because the outer surface of the insulating glass becomes cooler, the better the heat insulation is.

Residential and
office building
Vomp (A)
Built with:
NEUTRALUX®
advance ///
Photo: © ISOLAR®



Quality and safety with ISOLAR® glass

The production of **NEUTRALUX®** heat-insulation glazing is subject to comprehensive supervision by the manufacturing facility and the **ISOLAR®** Group in accordance with the specifications of EN 1279. Numerous manufacturing facilities are additionally

monitored by the Institut für Fenstertechnik in Rosenheim, as well as by other independent Institutes in Europe. The characteristics of **NEUTRALUX®** heat-insulation glass can be combined with those of other functional glasses:



AKUSTEX®

Sound-insulating glass – added comfort through sound-reduction



SOLARLUX®

Sun control glass – energy-saving and aesthetic design



MULTIPACT®

Attack-blocking glazing for protection of property and against burglary



DEKOREX®

Glazing for design purposes



VACUREX®

Optimum heat insulation with vacuum technology



ORNILUX®

Glass architecture and bird protection – not a contradiction



VISOREX®

Glazing with light-diffusing and light-directing characteristics as well as switchable glazing

← Sports and
Recreational Pool
Centre, Filderstadt-
Bonlanden
Built with:
NEUTRALUX®
advance // and
NEUTRALUX®
advance ///
Photo: © Arnold Glas



ISOLAR NEUTRALUX®



Peter Hahn, Winterbach
Built with:
NEUTRALUX® advance ///
Photo: © Arnold Glas

We will be pleased to advise you

ISOLAR®, your expert partner in everything to do with glass: We provide innovative, customized solutions for the widest range of different requirements.

Just ask us!



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