



UNIGLAS®  
ALL CLEAR



UNIGLAS® | **INSULATING GLASS**  
C o m p e t e n c e   b r o c h u r e



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### Insulating glass is quality of life

Let light into your life! With spacious window areas and transparent facades you create bright rooms for living and working. Individual and multifaceted living environments come into being with functional glasses that feature a variety of forms.

Yet glass is much more: innovative glass solutions contribute decisively to the use of resources on a sustainable basis. You save money by confronting soaring energy prices with energy saving measures, and at the same time you contribute to the protection of the environment by minimising your own CO<sub>2</sub> footprint.

You also create an optimal indoor climate for yourself and your family. On hot summer days it provides a pleasantly cool indoor climate through integrated solar protection and saves you the need for expensive air conditioning units. In the icy winter, the energy-efficient thermal insulation ensures comfortable warmth and reduced heating costs.



### **...and much more!**

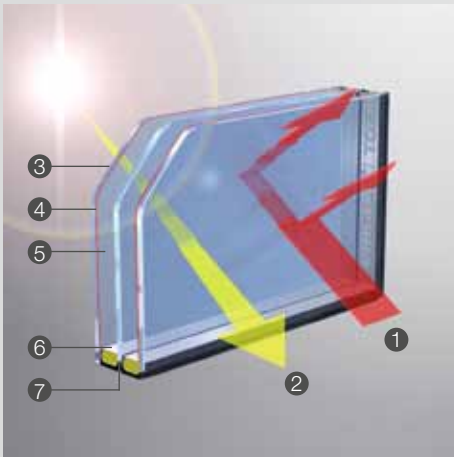
And this is not everything, not by a long shot. Our immediate living environment is becoming louder and louder. Noise generates stress. With the right insulating glass you effectively protect yourself and your family against noise pollution. Noise remains outside, while you can live and work quietly and relaxed in your rooms.

Our safety insulation glasses ensure the feeling of safety and security. They offer you protection against uninvited "guests" and protect what is near and dear to you.

You see, insulating glass has many facets. Let us show you the virtually endless possibilities to make your living environment even more liveable with high-quality glass. Our glass solutions are as universal and flexible as your ideas.



UNI GLAS® | TOP  
Energy-saving glass



1. Reflection of thermal radiation
2. Total solar energy transmittance
3. Float glass pane
4. Low-e coating
5. Cavity filled with inert gas
6. Spacer bar with desiccant
7. Two-stage, edge sealant

### Save energy/money with the right glass

With UNI GLAS® I TOP the heat stays inside and the cold outside. It's that simple! Do not squander precious energy, and lower your heating and energy costs sustainably and efficiently.

UNI GLAS® I TOP is a specially developed heat protection glass that reflects the thermal radiation of the heating unit and thus keeping the warmth in the room. On the other hand, it allows the visible light of solar radiation to penetrate virtually unhindered, and in so doing contributes substantially towards heating the room and towards your living comfort.

- Excellent thermal insulation values ( $U_g$  values)
- Substantially higher total solar energy transmittance (g-value)
- First-class light transmission ( $\tau_v$ )
- Optional warm edge spacer (PSI-value)
- High colour neutrality ( $R_a$  value)

You can obtain further information in the UNI GLAS® total product overview



Photo: UNIGLAS

- Greater living comfort through pleasant indoor climate
- Energy savings
- Reduction of CO<sub>2</sub>
- Reduction of heating costs, even with large-scale glazing
- High degree of light transmission
- High degree of building energy efficiency

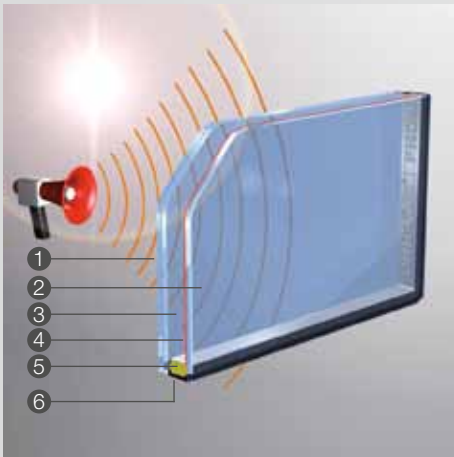
The innovative processing technology – with which the hermetically sealed panes between the spaces of the double and triple glazed glass panes are filled with inert gas – ensures this. The warm edge spacer, also reduces heat losses in the transition area from glass to window frame.

UNIGLAS® I TOP also leaves nothing to be desired in terms of design. Due to the optimal thermal insulation of the glass you have considerable freedom in the utilisation of glass areas within the framework of prevailing regulations for building insulation. Because UNIGLAS® I TOP insulates window areas just as effectively as the surrounding masonry, and thus increases the overall energy efficiency of the house. Do not forego spacious glass areas — window bars and silk-screen designs are also possible!

Give free rein to your design ideas — UNIGLAS® I TOP will take care of the insulation!



UNI GLAS® | PHON  
 Sound reduction glass



1. Laminated glass pane with NC foil
2. Float glass pane
3. Cavity filled with inert gas
4. Low-e coating
5. Spacer with desiccant
6. Two-stage, edge sealant

### Ensure quiet with the right glass

UNI GLAS® | PHON transforms your four walls into a quiet zone. Optimal sound insulation is becoming more and more important in an increasingly noise-intensive environment. With UNI GLAS® | PHON you can erect your own protective barrier against noise and consistently lock it out. Retreat to your own oasis of relaxation and regenerate for your everyday life.

Depending on noise source as well as the location and occupancy of your rooms, your personal sound insulation concept will be individually adapted for you and your family. Your UNI GLAS® partner will gladly help you with the selection of the right construction option so that you can live and work without stress.

The functionality of UNI GLAS® | PHON is amazingly simple: the asymmetrical pane structure and the application of special laminated glasses muffles the sound waves thus effectively reduces the noise level. Enjoy your well-deserved hours of leisure and enlightening conversations behind UNI GLAS® | PHON.

- Outstanding sound insulation properties with peak values ( $R_w$  value)
- Varying glass thicknesses
- Asymmetrical structure
- Sound insulation properties
- Laminated safety glass with sound protection foil
- Noise-dependent range of products = optimal application in the vicinity of streets, rails, aircraft

You can obtain further information in the UNI GLAS® total product overview



Photo: UNIGLAS

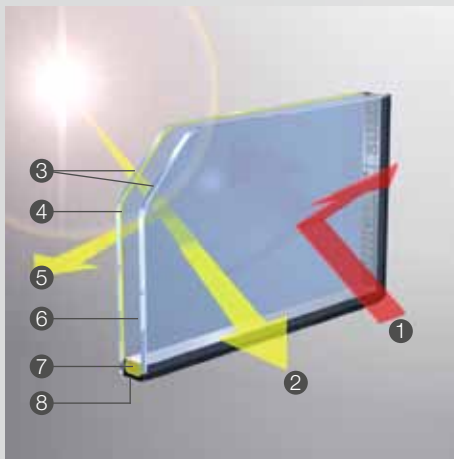
## How loud is “loud”?

- Individually adapted sound insulation
- Noticeably more light and transparency with substantially less noise pollution
- Adequate sound & thermal insulation = double effectiveness
- Thermotechnical and photometric properties like UNIGLAS® I TOP

The phenomenon “noise” can be best understood with the help of examples and comparisons. The table shows a few typical types of noise with their volume and the sensation triggered with it.

Type of noise	Volume (dB)	Sensation
	0	Auditory threshold
Rustling paper	0 - 10	Almost inaudible
Ticking clock	10 - 20	Hardly audible
Fine rain	20 - 30	Very faint
Television broadcast	30 - 40	Faint
Normal conversation	40 - 50	Rather faint
Office noise	50 - 60	Moderately loud
Road traffic	60 - 70	Loud
Loud music	70 - 80	Very loud
Loud factory building	80 - 90	Very loud
Compressed air hammer	90 - 100	Very loud to unbearable
Rock concert	100 - 110	Unbearable
Jet aircraft (50 m distance)	110 - 120	Unbearable
	120 - 130	Pain threshold

UNI GLAS® | SUN  
Solar control glass



1. Reflection of thermal radiation
2. Light transmission
3. Float glass pane
4. Low-e coating
5. Reflection
6. Cavity filled with inert gas
7. Spacer with desiccant
8. Two-stage, edge sealant

### Generate a personal wellness climate with the right glass

Create your own comfortable climate in the summer as well as in winter through the utilisation of UNI GLAS® | SUN. Even with south-facing windows and proportionately stronger solar radiation UNI GLAS® | SUN always ensures pleasantly temperate rooms. The innovative combination of solar protection and insulating glass is structured so that you obtain an indoor climate with an optimal supply of daylight with simultaneously higher colour neutrality and more effective insulation throughout the year: in the winter it remains comfortably warm inside, pleasantly cool in the summer — without additional air-conditioning expenditure! UNI GLAS® has a large selection of varying solar protection glasses for all requirements in the programme.

- Perfect for glass areas with stronger solar radiation
- Convincing degree of light transmission ( $\tau_v$ )
- Outstanding g-value
- Great variety in reflection from neutral to strongly reflective
- Ideal selectivity constants
- Large selection of various solar protection glasses

You can obtain further information in the UNI GLAS® total product overview

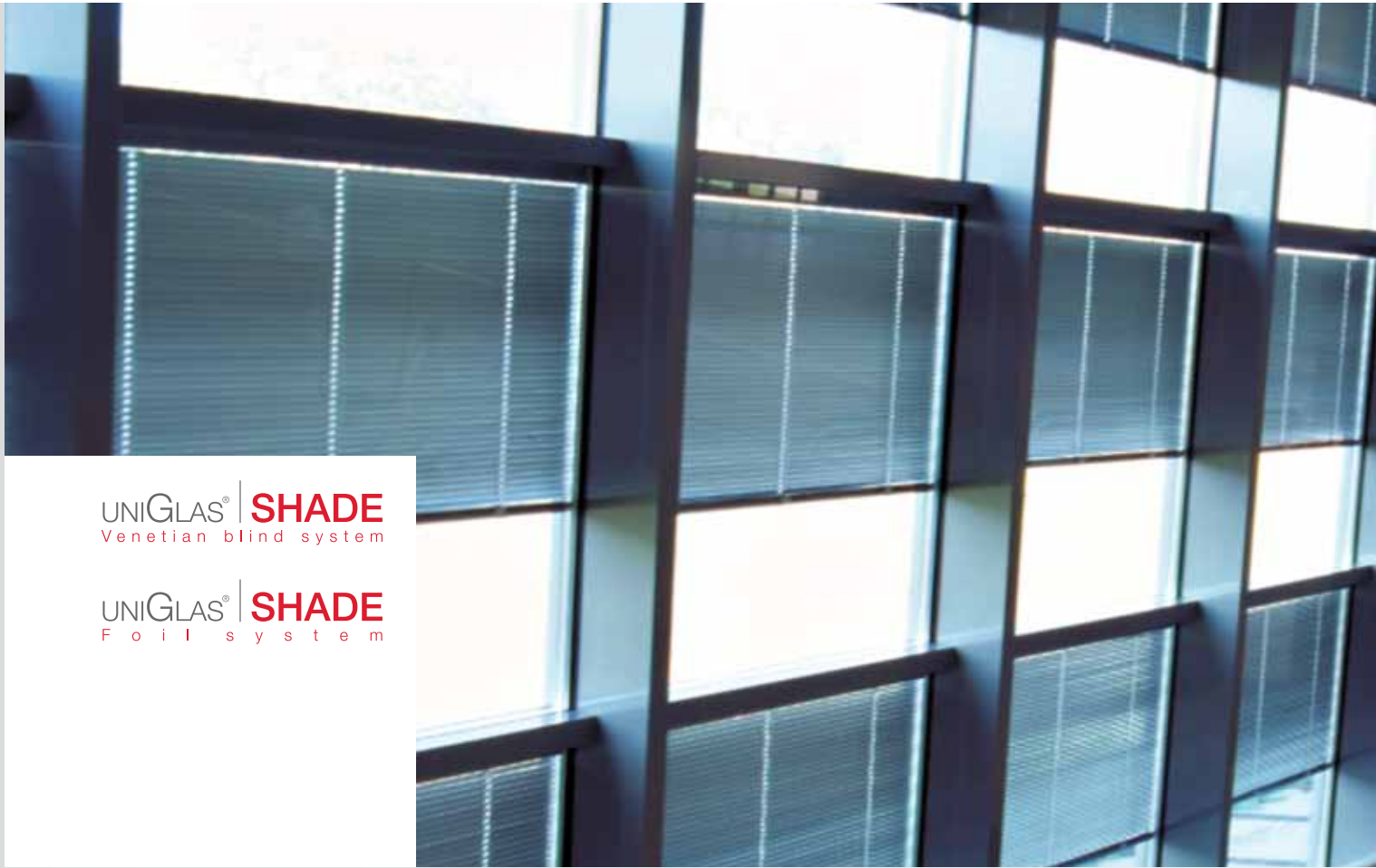


Photo:UNIGLAS

- Heat-free ambience without additional air-conditioning expenditure in the summer
- Wellness indoor climate for more quality of life
- Savings on air-conditioning and heating costs
- Thermal insulation properties like UNIGLAS® I TOP

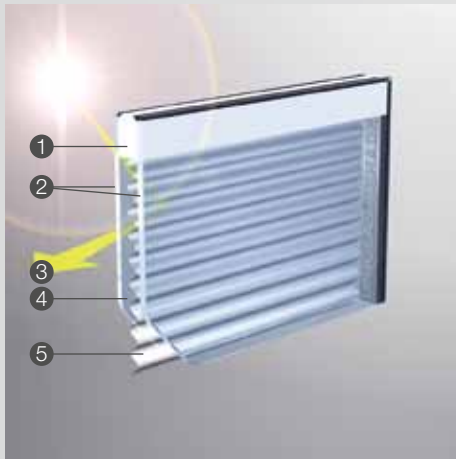
Since the efficiency of solar protection glazing depends on various parameters, UNIGLAS® I SUN has an optimal material mix: highly selective layer systems reflect the main portion of long-wave, heat-generating solar radiation, whereas the short-wave, light-generating solar radiation is mostly allowed through. So the heat remains outside without any loss of luminosity.

UNIGLAS® I SUN prevents unpleasantly high room temperatures and lowers your cooling costs. So it also provides the enhancement of a “psychological” indoor climate. Rooms which are as bright as day and flooded with light contribute towards a positive atmosphere and to an increase in motivation and productivity in commercial buildings



UNI GLAS® | **SHADE**  
Venetian blind system

UNI GLAS® | **SHADE**  
Foil system



1. Motor with cover (approx. 80 mm)
2. Float glass pane
3. Reflection
4. Cavity filled with inert gas
5. Foil

### Always the optimal lighting conditions with the right glass

The UNI GLAS® | SHADE jalousie and foil systems are the intelligent form of variable sunlight screening. The foils or jalousies which are completely integrated into the spaces between panes provide unrestricted possibilities for function and design-oriented architecture. They can specifically control the degree of light and heat, and thus ensure your very individual wellness indoor climate with optimal lighting conditions. You have control over the incidence of light and can specifically distribute the light. In the closed position you obtain effective sunlight screening and excellent visual cover which safeguards your privacy. Furthermore, the weather-resistant and cleaning-free foil system always makes it possible for you to work in daylight without glare.

- Manual and electrical control for convenient operation
- Adjustable jalousie
- Jalousie system integrated as Venetian shutter (aluminium blade), pleated fabric or foil roller blind
- Screened PC workstations
- Reduced Ug values with closed jalousie and closed foil roller blind
- Foil system based on integrated roller blind; values as with external shading are possible

You can obtain further information in the UNI GLAS® total product overview



Photo:UNIGLAS

- Noticeably lowers heating and cooling costs
- Highly efficient solar and glare protection
- Weather-resistant and cleaning-free
- Freedom from maintenance and long lifespan (continuous operation up to 200,000 cycles in the foil system)
- Easy and convenient operation

Aluminium blades, pleated fabric and foil roller blinds which allow you to choose your very own design are available for the internal jalousies from UNIGLAS® | SHADE. There is a large selection of colours for the uniform configuration of the overall concept of your building.

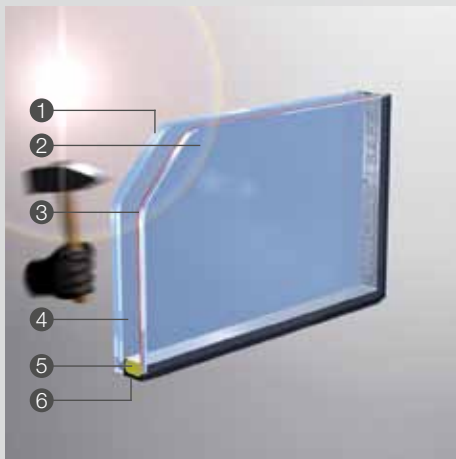
The operation of the jalousies or foils occurs conveniently via an electrical system that you can control manually or via remote control as desired. Or you can make it very simple and select the fully automatic regulation by means of microprocessor or BUS control. A solar sensor for network-independent operation – which is very advantageous, particularly with a retrofit – is available. UNIGLAS® | SHADE, for which the CE marks also unrestrictedly applies, is offered as an optimal solution for adaptation to summer thermal insulation — without losses with regard to optics, functionality and ease of maintenance.



1. Jalousie box
2. Flat glass pane
3. Reflection
4. Cavity filled with inert gas
5. Blade

UNIGLAS® | **SAFE**  
S a f e t y g l a s s

UNIGLAS® | **SAFE**  
A l a r m g l a s s



1. Burglar-resistant pane
2. Float glass pane
3. Low-e coating
4. Cavity filled with inert gas
5. Spacer with desiccant
6. Two-stage, edge sealant

### On the safe side with the right glass

UNIGLAS® | SAFE offers you an extensive selection of armoured safety glazing, regardless of whether you want to protect a public or private area. With UNIGLAS® | SAFE you are always on the safe side. UNIGLAS® | SAFE ensures reliable protection for your family or workforce. UNIGLAS® | SAFE opens new horizons for you, because it enables the large-scale application of insulating glass in safety-sensitive properties and buildings without neglecting the protection of people and material assets. The large variety of types and combinations makes the implementation of an object-specific safety concept possible.

Play it safe with UNIGLAS® | SAFE — for everything that is near and dear to you!

- Officially certified safety according to DIN 52290, EN 356, EN 1063 and VdS (German safety & security institution) loss prevention requirements
- The four safety classes of UNIGLAS®:  
P-A = impact-resistant  
P-B = burglary-resistant  
BR = bullet-resistant  
D = explosion-resistant
- Possible as a combination of single-pane safety glass (ESG) and laminated safety glass (VSG)

You can obtain further information in the UNIGLAS® total product overview



Photo: JOSKO

## Invisible safety with UNIGLAS® | SAFE

- Special single-pane glass with invisibly affixed sensors
- Integrated thermal & solar protective coating
- Evaluation unit in flush socket for parallel connection of several elements and alarm systems
- Suitable for all protection requirements in the private and public realm
- Security against burglary, gunshot, explosion, damage and injury

Feeling safe and secure within one's own four walls is a fundamental human need. This is easy to realise with UNIGLAS® | SAFE.

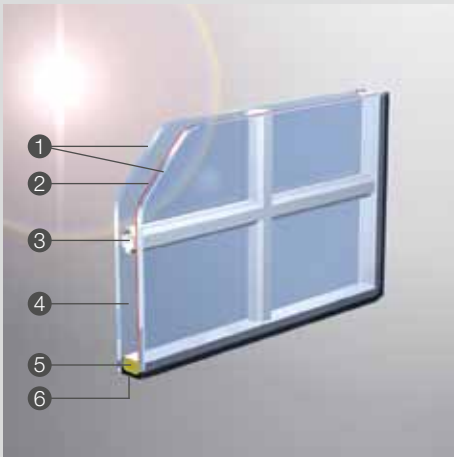
UNIGLAS® | SAFE is a specially developed single-pane safety glass with two sensors affixed in the edge area. In comparison with products from other manufacturers, UNIGLAS® | SAFE manages completely without visible alarm circuits and wires.

In addition, UNIGLAS® | SAFE offers the possibility of integrated thermal & solar protective coating. The intelligent evaluation unit scans the resistance of the electrical conducting thermal & solar protection layer and triggers the alarm in the event of damage.

The evaluation unit itself is integrated into a flush socket and enables the parallel connection of several elements. It can also be connected with other alarm systems.



UNI GLAS® | DESIGN  
G l a s s d e s i g n



1. Float glass panes
2. Low-e coating
3. Georgian bar
4. Cavity filled with inert gas
5. Spacer with desiccant
6. Two-stage, edge sealant

### Modern elegance as desired

**Silk screening:** Take advantage of all design possibilities which are tailored entirely according to your taste. Virtually unlimited design possibilities can be realised on almost any type of glass with the ceramic silk screening technique. Whether heat protection glass, single-pane safety glass or laminated safety glass: nearly all glasses can be designed with ceramic silk screen. There are also hardly any limits on the range of colours and motifs. A unique symbiosis of architectural art, functionality and durability is thus created through the ceramic halftone silk screening.

**Schweizer Kreuz and Wiener Sprosse:** with lattice windows you can also bring colour to life and combine all advantages of insulating glass with those of individual colour design. Lattice windows lend any building an extra touch of cosiness and friendliness. UNI GLAS® differentiates between “Schweizer Kreuz” and “Wiener Sprosse”. With Swiss Cross the window bars are found between the panes of insulating glass. For this reason, very convenient cleaning is

- Attractive and high-quality design possibilities
- Virtually unlimited variety of colours
- Fulfilment of all standards and safety aspects
- Symbiosis of art and functionality
- UNI GLAS® | DESIGN is realisable with all aforementioned glasses

You can obtain further information in the UNI GLAS® total product overview



Photo:UNIGLAS

- Save energy, spare resources
- Enhancement of indoor climate
- Reduction of condensation water formation
- Increase of surface temperature
- Reduction of heat losses
- UNIGLAS® recommends the utilisation of UNIGLAS® I TS thermo spacers

possible. With the “Wiener Sprosse”, however, fitted sash bar profiles are also utilised in addition to spacers in the space between panes. The optical impression of a genuine lattice window is created without compromising the optimised thermal insulation. Brass and lead sash bars as well as a large number of other design possibilities complete the UNIGLAS® product line.

### **Insulate windows, but correctly: it depends on the spacer!**

With glass it is already possible to reduce heat loss to a minimum, but energy leaks often occur in the transition regions from glass to frame or from frame to wall. But this heat loss can be reduced. UNIGLAS® I TS thermo spacers (“warm edge spacers) from a specially designed profile ensure substantially higher temperatures on the edge of the glass. The energy leak is closed. The spacers ensure that you must heat or cool less, and thus you actively reduce CO<sub>2</sub> emissions and your CO<sub>2</sub> footprint. Your high-quality insulating glass becomes a top-class thermal product.



## UNIGLAS® – important definitions

### **b-factor:**

The “mean transmission factor b” is the decisive variable for calculation of the cooling load. The b-factor is also called “shading coefficient”. And according to VDI [Association of German Engineers] 2078, it is the ratio from the g-value of the respective glazing and the g-value of a two-pane normal glass window, and is assessed as a constant with 80 percent ( $b \sim g \text{ glazing}/0.80$ ).

### **Total solar energy transmittance (g-value):**

The g-value (total solar energy transmittance or solar factor) is a surveying variable only useful with transparent construction materials. It indicates how much percentage of solar energy enters inside areas through the glass, including the secondary thermal radiation which the glazing releases inwardly on account of the absorbed solar energy.

### **Light reflexion $\rho_v$ :**

On the other hand, the degree of light reflection indicates to which portion (in percent) the visible light is reflected on the surface of the glass – in turn, in the wave range from 380 to 780 nm.

### **Light transmission $\tau_v$ :**

The degree of light transmission is the percentage of visible light (wavelength from 380 to 780 nm) which passes through the glass – in relation to the human eye’s degree of spectral light sensitivity.

### **PSI value $\Psi$ :**

This value describes the length-related heat transfer coefficient, and thus the thermal bridge of a structural component. With regard to windows, the thermal bridge consists mainly of the correlation of window frame, insulating glass and its spacer and the mounting depth in the window frame — i.e. the  $\Psi$  value is exclusively for the structural component window.

### **Sound insulating capacity $R_w$ :**

For sound-technical evaluation of glazing according to DIN 20140, Part 3, the sound insulating capacity  $R_w$  is determined through measurement and comparison with a reference curve. It is designated in decibel (dB). On account of the logarithmic scale, an improvement in sound insulation of 10 dB brings about a halving of the noise pollution.



Photo:UNIGLAS

#### **Selectivity (F):**

The selectivity of a solar protection glass describes its efficiency, namely the ratio of light transmission to total solar energy transmittance. With 66/36, 66 percent of the daylight, but only 36 percent of the total energy reaches the room. If one divides 66 by 36, one attains a selectivity factor near two. This is a value that can hardly be surpassed, since it lies near the limit of the physically feasible.

#### **Spectrum adaptation terms (C and $C_{tr}$ ):**

In order to take into consideration the individual frequency spectrums of the environment during the evaluation, there are the so-called spectrum adaptation terms C and  $C_{tr}$ , for the expanded frequency ranges from 3,150 to 5,000 Hz the correction factors are designated as  $C_{100-5000}$  and  $C_{tr 100-5000}$ .

#### **Thermal transmittance coefficient (U):**

The U value indicates the heat quantity per time unit which passes through 1 m<sup>2</sup> of a structural component with a temperature difference of the adjacent ambient and external air of 1 K. The smaller the U value, the greater the thermal insulation is. The unit of measurement is W/m<sup>2</sup>K. The basis of calculation for the glazing (U<sub>g</sub>) is EN 673.



UNIGLAS®  
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### The UNIGLAS® cooperation

The name UNIGLAS® stands for technical progress and innovative solutions for insulating glass and special glass as well as all types of glass refinements. Established in 1995, today a vast number of equal partners from Germany, Austria, Switzerland and The Netherlands belong to this unique cooperation. Many years of experience, close cooperation with glass processors and window fitters as well as a close-meshed network of local partners give UNIGLAS® the possibility to react quickly and reliably to your requirements and individual wishes.

With UNIGLAS® you are in good hands. The advantage for you: as a competent partner with profound know-how we, together with you, bring projects to fruition — on schedule and efficiently. Naturally in compliance with the utmost quality requirements and with the greatest possible planning safety through our guarantee fund!

You can rely on our competence, because everything is clear with UNIGLAS®!

- Guarantee fund
- CE certification
- Broad range of products
- UNIGLAS® I SLT software for project planning independent of manufacturers
- Own testing laboratory
- Technical support



Photo:UNIGLAS

## Achieve more together — UNIGLAS®

- Flexibility and independence from manufacturers
- Well-rounded competence
- Many years of market experience
- Genuine added value through lived partnership

Because of the strong sense of obligation to its customers and partners UNIGLAS® and its shareholders have established a guarantee fund as well as a delivery and service guarantee. These ensure you on-schedule execution of agreed services no matter what happens.

All UNIGLAS® products are CE certified and meet all requirements of the European Commission Construction Products Directive. Incidentally, UNIGLAS® was the first corporation to have its products CE-certified.

You will find more information and technical guidelines on our homepage at [www.uniglas.net](http://www.uniglas.net), or contact your UNIGLAS® partner enterprise.

Our proximity –  
your advantage



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