



# DAYLIGHT AND SUMMER HEAT PROTECTION

Energy-efficient glass solutions

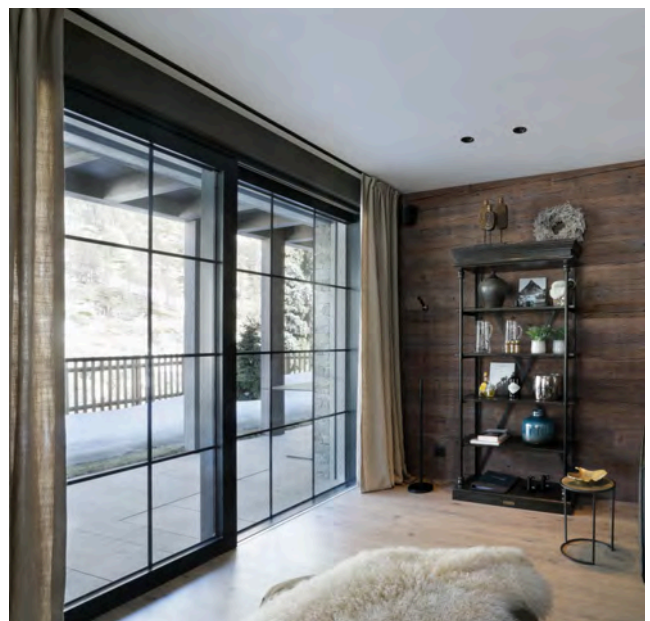


# Our goals: Comfortable rooms while protecting the climate

Summers are getting hotter here: long dry spells with temperatures of well over 30 degrees are no longer uncommon even at our latitudes. Climate change is also having an impact on architecture. This is because the proportion of transparent surfaces in buildings, i.e. windows or glass façades, has also been increasing steadily for years. This has to do with the fact that glass nowadays can insulate just as well as solid façade elements, but at the same time allows a lot of daylight into the building. And as we all know, natural light is not only healthy and improves performance – it also ensures that less energy is needed for artificial light.

While maximum sunlight is welcome in winter, it can pose a challenge to the climate inside a building in the summer months. If appropriate protective measures are not taken, a heat wave can quickly lead to temperatures that make the room unpleasant to be in and jeopardise restful sleep. External sun protection solutions such as shutters and awnings offer one way to reduce temperatures. However, these are not always the right choice and can be complex, especially for large-scale glazing. Last but not least, they can dominate the view.

There is a demand for windows and glass façades that combine two, at first glance, rather contradictory characteristics: they should allow as much natural light into the building as possible, but at the same time help to prevent the interior from overheating during the warmer months. The Swiss standard SIA 180 also requires proof of sufficient summer heat protection for new buildings and energy-related renovations. This should be considered as early as possible, as early as the planning phase of a building. As a glass specialist, we would like to present solutions on the following pages that reconcile the advantages of glass as a transparent material with the requirements of modern climate management – and, importantly, that also visually meet the high demands of contemporary architecture.



# We are your partner for buildings that comply with the Minergie building standard

As an Alpine country, Switzerland is severely affected by climate change. Around 45% of our national energy requirements are used for heating, and increasing amounts also for cooling buildings. As a Swiss family-run company and manufacturer of building materials, we therefore feel a particular responsibility to make a significant contribution to reducing energy consumption in order to minimise the emission of harmful greenhouse gases. We do this primarily by developing energy-efficient glass solutions, as presented in this brochure. Glass is energy-intensive to manufacture. However, once installed in a building, its energy-saving potential is so high that this is balanced out within about two years. With an average lifespan of around 30 years, the positive energy balance of our window and façade glass is even more pronounced.

The Glas Trösch Group attaches great importance to constantly reducing the CO<sub>2</sub> emissions caused by the production of our glass. This can be achieved, for example, by using green electricity, through energy recovery, through increasingly efficient technologies and through the increasing use of glass shards in glass production. In doing so, we have ourselves audited and certified by independent institutions. In addition to the appropriate ISO certifications, this also includes the EnAW label "CO<sub>2</sub> & kWh reduced".

Minergie is the Swiss building standard for particularly energy-efficient new and modernised buildings. It represents independent quality assurance and enjoys widespread acceptance. An increasingly important component of the evaluation of Minergie buildings is the heat protection module, which should be planned as an interdisciplinary topic.

**MINERGIE®**

## **Glas Trösch – Your supply partner**

If you work with Glas Trösch, you will receive more than one solution – we offer our customers a complete package with every order.

### **Advice**

Get in touch with us. Our specialists will be happy to support you with their knowledge and experience. We would be happy to work with you to push the boundaries and develop unique solutions.

### **Quality**

SILVERSTAR insulating glass is manufactured in Switzerland. Assembly is subject to strict quality criteria.

### **Service and proximity**

Thanks to our many locally-based processing plants, we can quickly get to where you need us. Long-term availability of all system components.

# The tried-and-tested solution: SILVERSTAR sun protection glass

SILVERSTAR solar protection glazing features wafer-thin layers of metal or metal oxide that effectively reduce heat input without hindering transparency. The complex coating systems reflect the long-wave infrared rays of the incident solar radiation, which are largely responsible for heating up interior spaces. Short-wave, visible radiation, on the other hand, can pass through unhindered to a large extent. As a result, solar protection layers reduce the influx of energy from the outside to the inside and let a lot of natural daylight into the room.

Glas Trösch offers a wide selection of solar protection glazing with individually tailored levels of light transmission (LT value) and total energy transmission (g value). In this way, the indoor climate remains pleasantly comfortable even in summer and the costs of energy used for cooling are reduced or avoided altogether.

## In a nutshell

### Functionality

Highly effective sun protection coatings that combine summer heat protection with varied levels of light transmission; additional thermal insulation layers also give optimum heat insulation properties in winter.

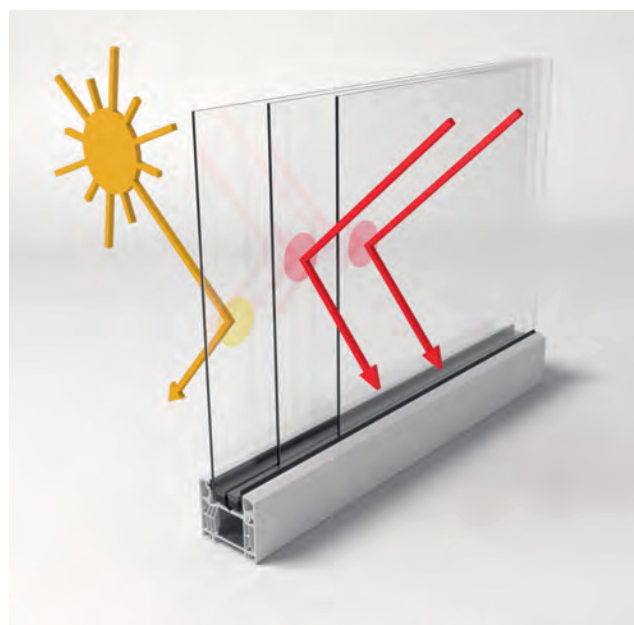
### Aesthetics

Depending on the sun protection glass, either a natural, neutral look or a brilliantly coloured appearance.

### Sustainability

High energy-saving potential thanks to permanent summer heat protection combined with thermal insulation properties for the colder months.

## The structure of SILVERSTAR solar protection glazing



	Energy efficiency	Summer heat protection	Anti-glare protection	Controllability	Costs
<b>SILVERSTAR</b> Solar protection glass	●	○	○		●
SILVERSTAR CONTROL	●	●	●	●	●●
OKALUX Capillary system	●	●	●		●●
SILVERSTAR eyrise®	●	●	●	●	●●●

# The clever solution: SILVERSTAR CONTROL

With SILVERSTAR CONTROL, the incoming sunlight can be individually controlled by remote control using a blind integrated into the gap between the panes. The slats are controlled by an electric motor integrated in the header profile of the window, which is controlled by a miniature control unit or an app. The motors are extremely quiet and reliable.

The advantages of this system are clear: The visual impact of the glass façade is fully preserved. And, compared to SILVERSTAR sun protection glass, the amount of sunlight and thus also the influx of energy can be individually controlled depending on the weather conditions. This means you can go from complete glare protection or privacy protection to partial shading, all the way to an unobstructed view when the slats are fully open. SILVERSTAR CONTROL thus effectively reduces total energy transmission (g value) if required and, in conjunction with ideal thermal insulation properties, ensures an excellent energy balance.

## In a nutshell

### Functionality

Integrated slat system for individual energy management and optimum use of daylight; easy-care and maintenance-free compared to external blinds; effective glare protection combined with indirect lighting possible.

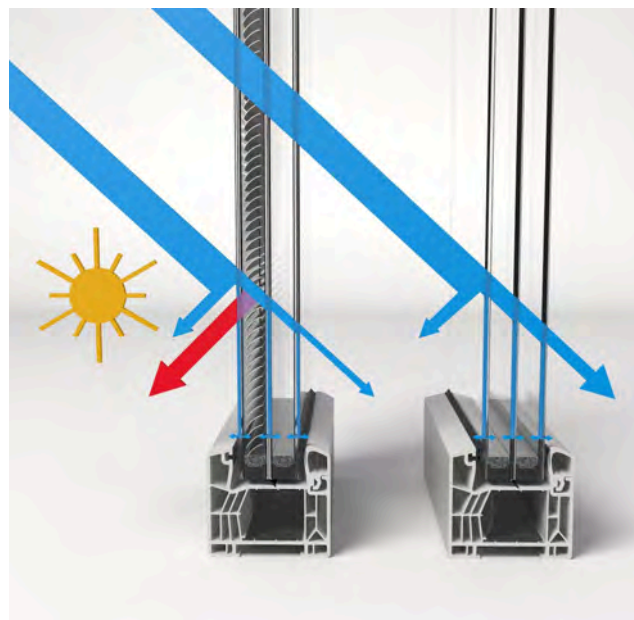
### Aesthetics

Consistently high-quality glass look without any aesthetic impairments.

### Sustainability

Particularly energy-efficient solution, as the g-value can be individually regulated by slat positioning; correspondingly low heating and/or cooling energy consumption.

## SILVERSTAR CONTROL design



	Energy efficiency	Summer heat protection	Anti-glare protection	Controllability	Costs
SILVERSTAR Solar protection glass	●	○	○		●
<b>SILVERSTAR CONTROL</b>	●	●	●	●	●●
OKALUX Capillary system	●	●	●		●●
SILVERSTAR eyrise	●	●	●	●	●●●

# The perfect solution: OKALUX capillary system

OKALUX insulating glass with capillary inserts ensures optimum light distribution indoors and also offers extremely effective protection against sunlight and glare. The countless fine scattering elements inserted in the space between the panes provide uniform and shadow-free illumination deep into the building.

The translucent panes are also suitable for areas of the building where views are not or only partially desirable: Depending on their intended use, they can be combined with fibre-optic fleece, which provides privacy and prevents glare. The capillaries are also ideal as roof glazing for lighting sports halls, museums and atria, for example. Depending on the design, the capillary structure is also visible on both sides and creates a vibrant façade surface that gives the impression of depth. The transmission value of the capillary glazing can be individually adjusted to the respective building requirements. This reduces or eliminates the need for air conditioning on hot summer days.

## In a nutshell

### Functionality

Integrated capillary system for optimum light distribution deep into the room; very high light transmission combined with effective summer heat protection; for rooms that need complete or partial privacy, or for roof glazing.

### Aesthetics

The fine surface of the capillary structure creates a lively appearance and interesting plays of light and shadow.

### Sustainability

High energy-saving potential thanks to permanent summer heat protection combined with optimum thermal insulation properties in winter.

## Design of the OKALUX capillary system

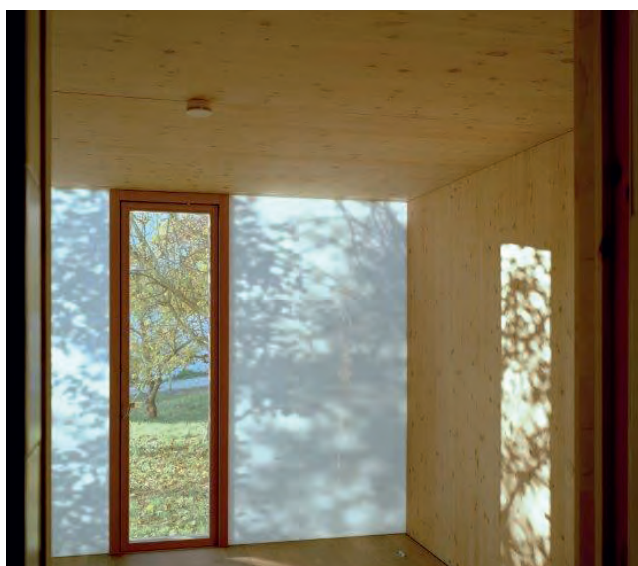
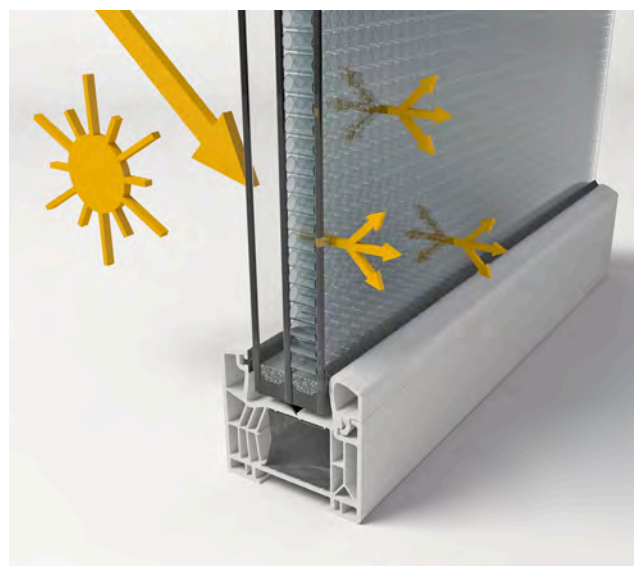


Photo: Deppisch Architekten



	Energy efficiency	Summer heat protection	Anti-glare protection	Controllability	Costs
SILVERSTAR Solar protection glass	●	○	○		●
SILVERSTAR CONTROL	●	●	●	●	●●
<b>OKALUX Capillary system</b>	●	●	●		●●
SILVERSTAR eyrise®	●	●	●	●	●●●

# The smart solution: SILVERSTAR eyrise®

With eyrise® technology, the light and energy input is controlled by liquid crystals in the space between the panes. At its heart is the transparent liquid crystal mixture licrivision®, to which dye molecules are added. This mixture is filled between two glass panes, which are provided with a transparent conductive coating. When a low electrical voltage is applied, the molecules change orientation and thus regulate the passage of light and heat.

eyrise® sun protection glass can be darkened in just a second, providing immediate protection from light and heat radiation. As the sunlight increases or decreases throughout the course of the day, the light transmission can be regulated and the shading of the windows is continuously adjusted. This reduces the cost of air conditioning and lighting. eyrise® windows with shade function lead to noticeable savings in energy costs, especially in variable weather conditions, when strong sunlight is replaced by temporary cloud cover.

## In a nutshell

### Functionality

Infinitely variable regulation of light and energy input via liquid crystals in the space between the panes.

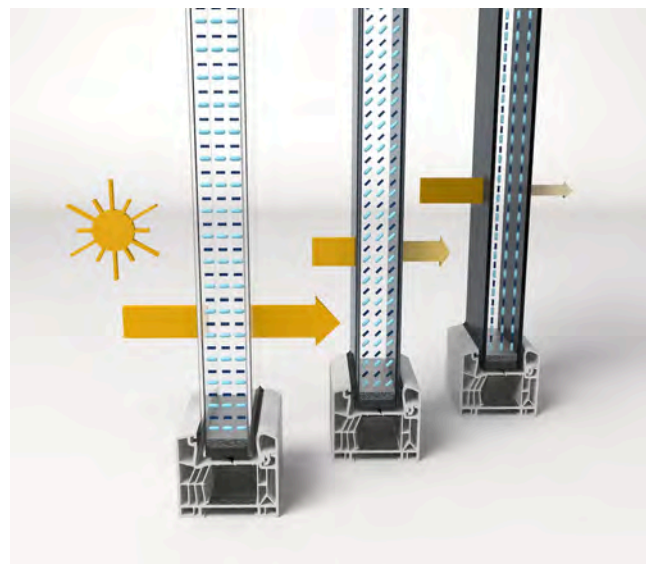
### Aesthetics

Uniform tinting of windows combined with transparency, even when darkened; various colours available.

### Sustainability

Particularly energy-efficient solution, as g-value can be individually regulated by liquid crystals; correspondingly lower heating and/or cooling energy consumption.

## SILVERSTAR eyrise® design



	Energy efficiency	Summer heat protection	Anti-glare protection	Controllability	Costs
SILVERSTAR Solar protection glass	●	○	○		●
SILVERSTAR CONTROL	●	●	●	●	●●
OKALUX Capillary system	●	●	●		●●
SILVERSTAR eyrise®	●	●	●	●	●●●

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