

## Daylight Systems – Required components of integrated light solution

Klaus Buntkiel-Kuck | 10.03.2014 | Innsbruck



# Agenda

---

	Page
1. Why daylighting	03
2. Basic parameters of daylight design	05
3. Integrated daylight solutions	07
4. Function and application of moveable prism system	13
5. Function and application of micro sun shielding louvre	18

---

# Why should we use daylight?

---



Daylight is a natural and free resource with its own qualities (dynamic, light color, color rendering).

Reducing the energy consumption for buildings (heating, ventilation, cooling)

Improving the energy efficiency of buildings

Reducing the CO<sub>2</sub> emissions

Sustainability in Civil Engineering

# How should we use daylight?

---



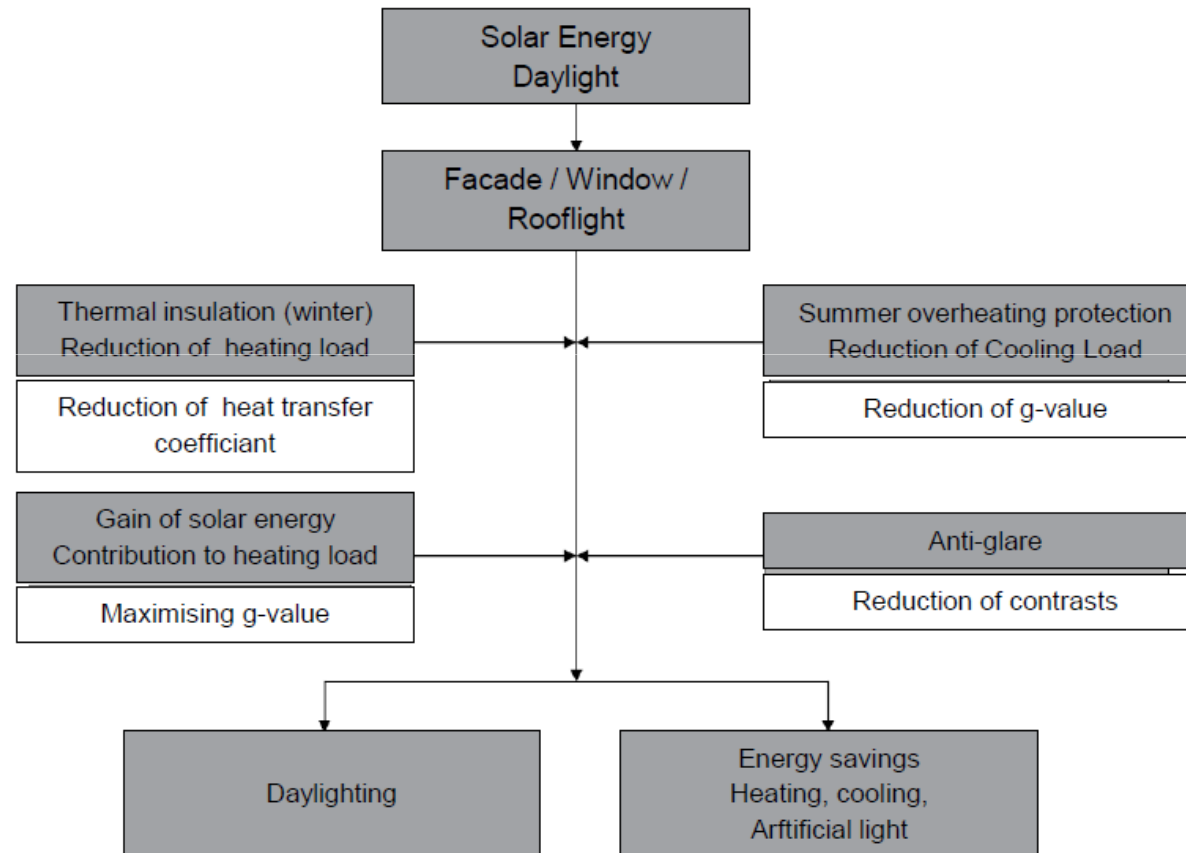
Fulfillment of modern standards and certification methods

Fulfillment of photometric quality criteria (illuminance, color rendering, glare, light distribution etc.)

Dynamic light situation for a good visual perception and improved well-being of the user.

# Basic parameters of daylighting design

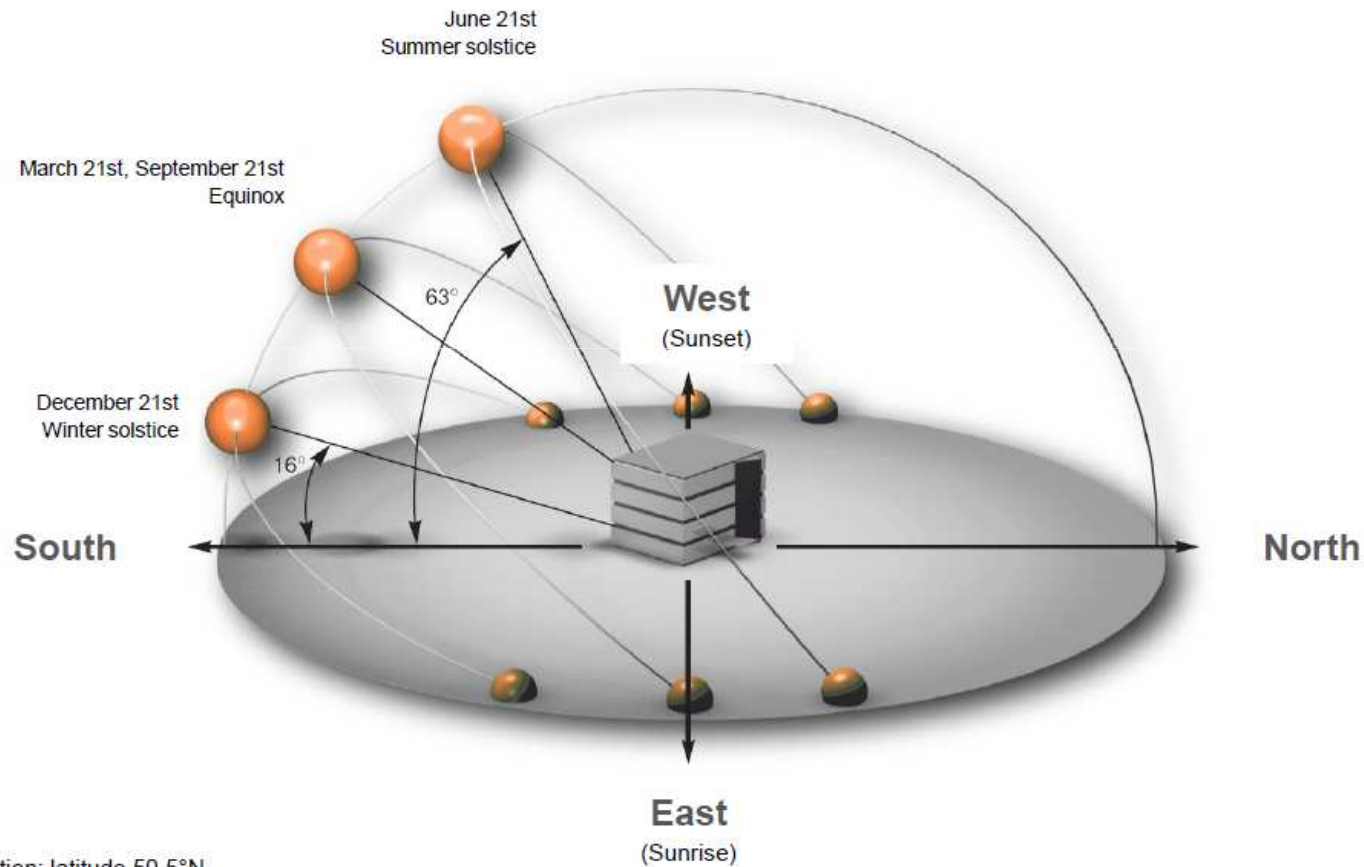
## Building Envelope – Daylighting Properties



Reference: Similar VDI 6011

# Basic parameters of daylighting design

Solar declination, solar altitude and azimuth



Example location: latitude 50,5°N

Reference: Similar VBG Broschüre „Sonnenschutz im Büro“

# Integrated daylighting solutions

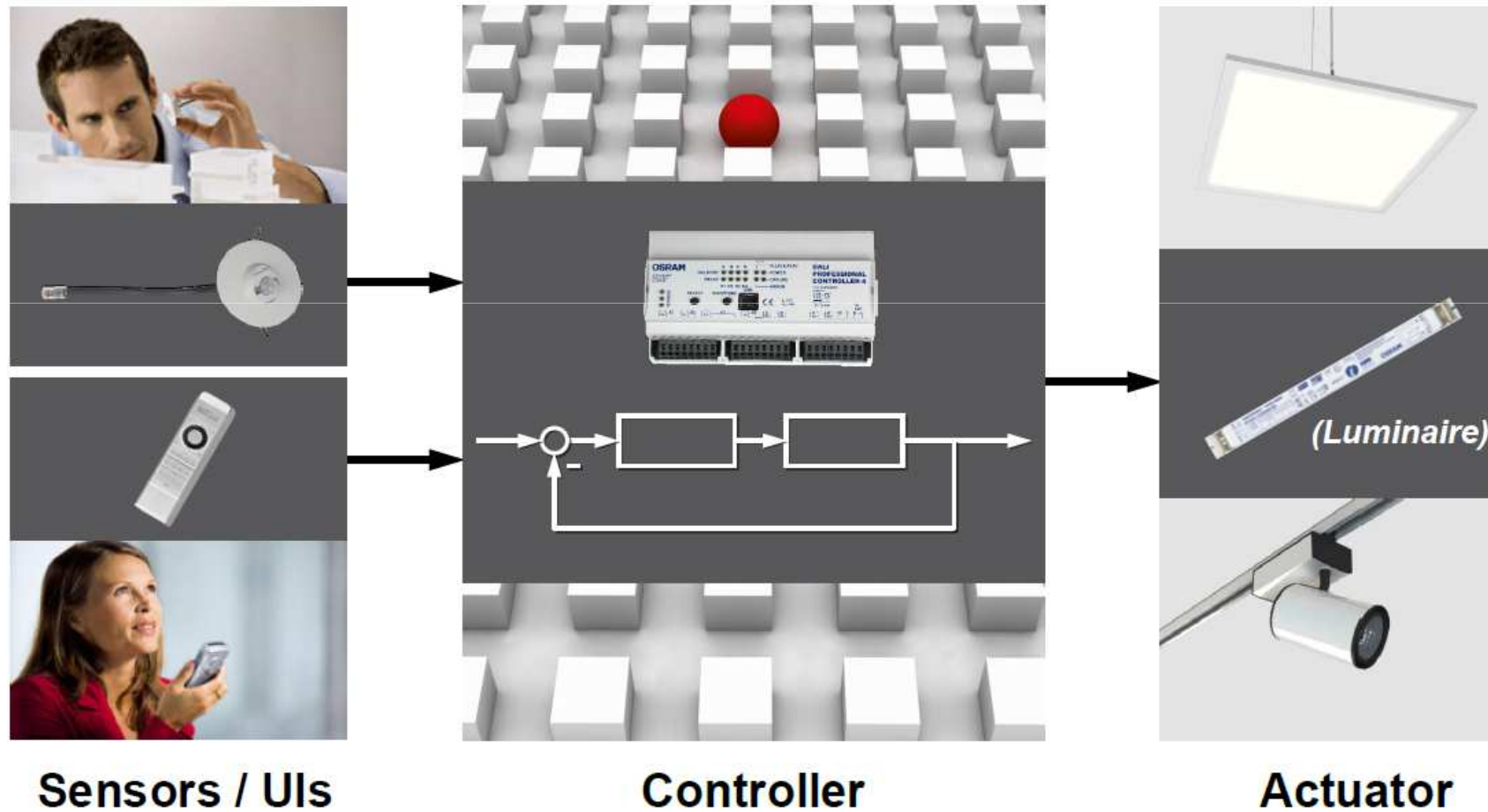
---



- Artificial light from best in class, highly efficient luminaires
- Benefiting from the advantages of daylight, whilst avoiding its disadvantages
- Light management using innovative technologies and compatibility with standard BUS systems

# Integrated daylighting solutions

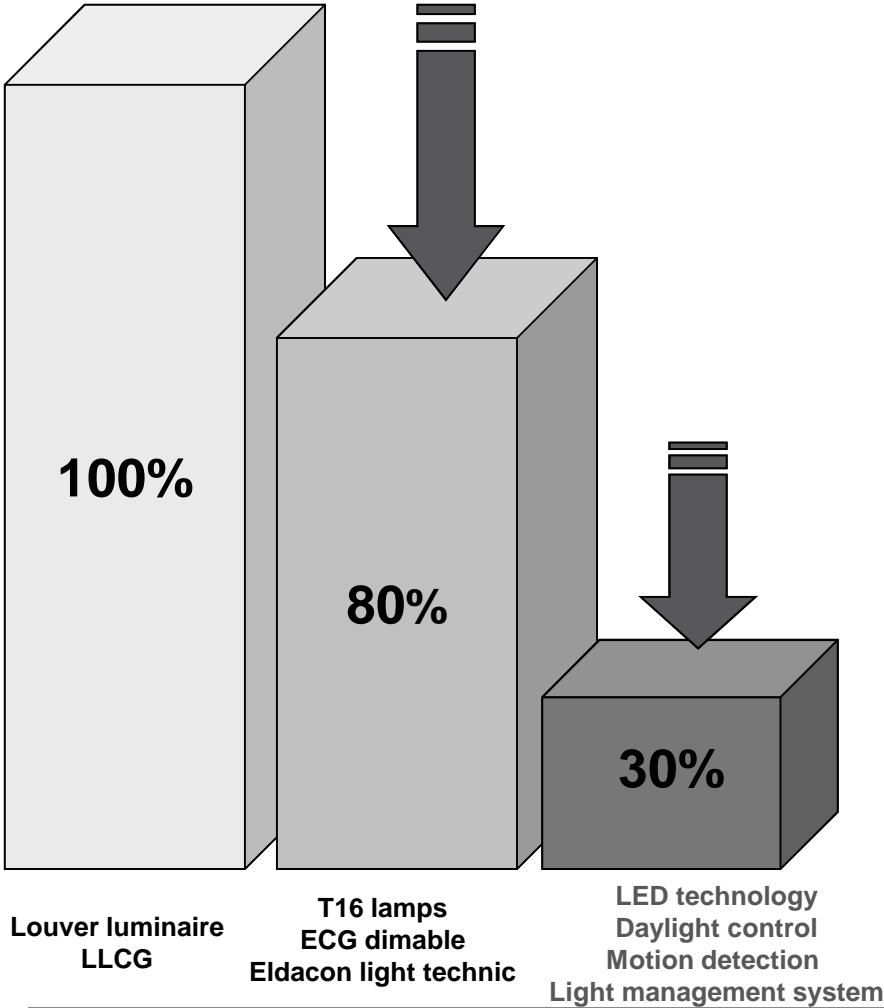
## Light Management Systems





# Energy savings

## Light management

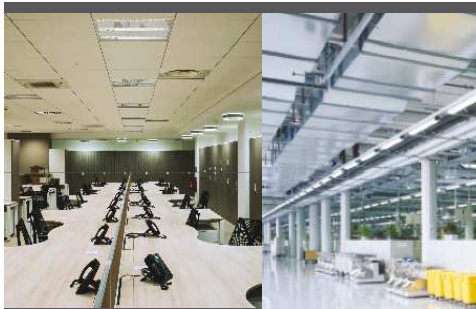


# Light management

## Luminous flux tracking

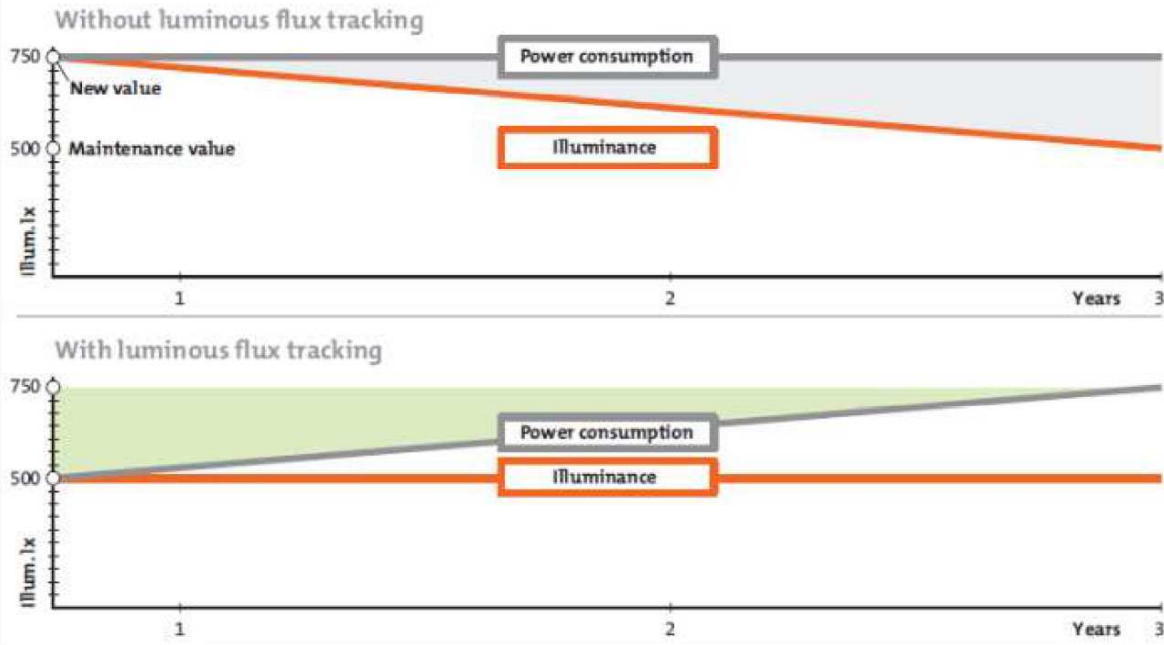
### Initial situation:

- Continuous use of areas
- No daylight entry



- Reaction with individual sensors, light management system or integration in building management system
- Energy savings depend on maintenance factor  
EN 12464-1, approx. 10–20 %  
(Source: licht.de)

### Options for saving – luminous flux tracking

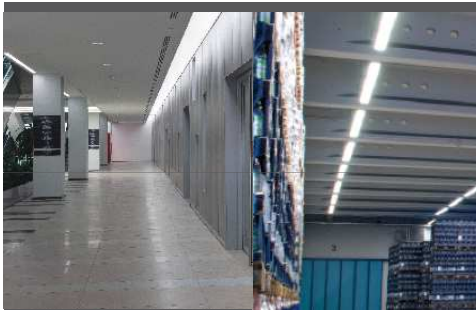


# Light management

## Motion detection

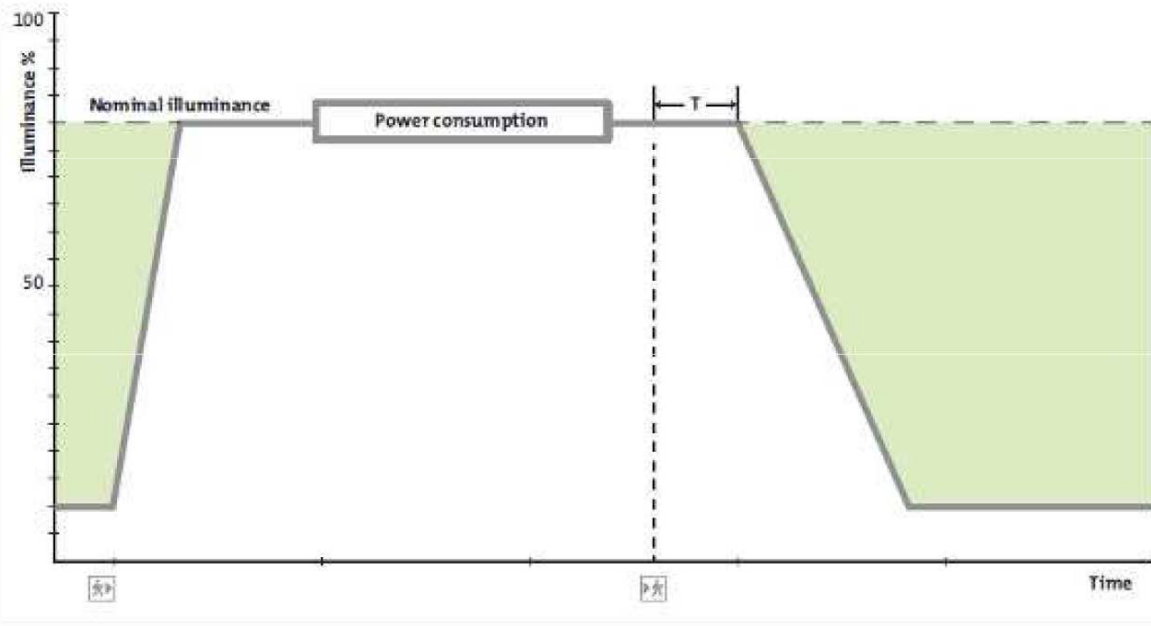
### Initial situation:

- Temporary use of areas
- No daylight entry



- Reaction with individual sensors, light management system or integration in building management system
- Energy savings depend on structural conditions approx. 10–50 % (Source: licht.de)

### Options for saving – motion detection (corridor function)



# Light management

## Motion detection and daylight control

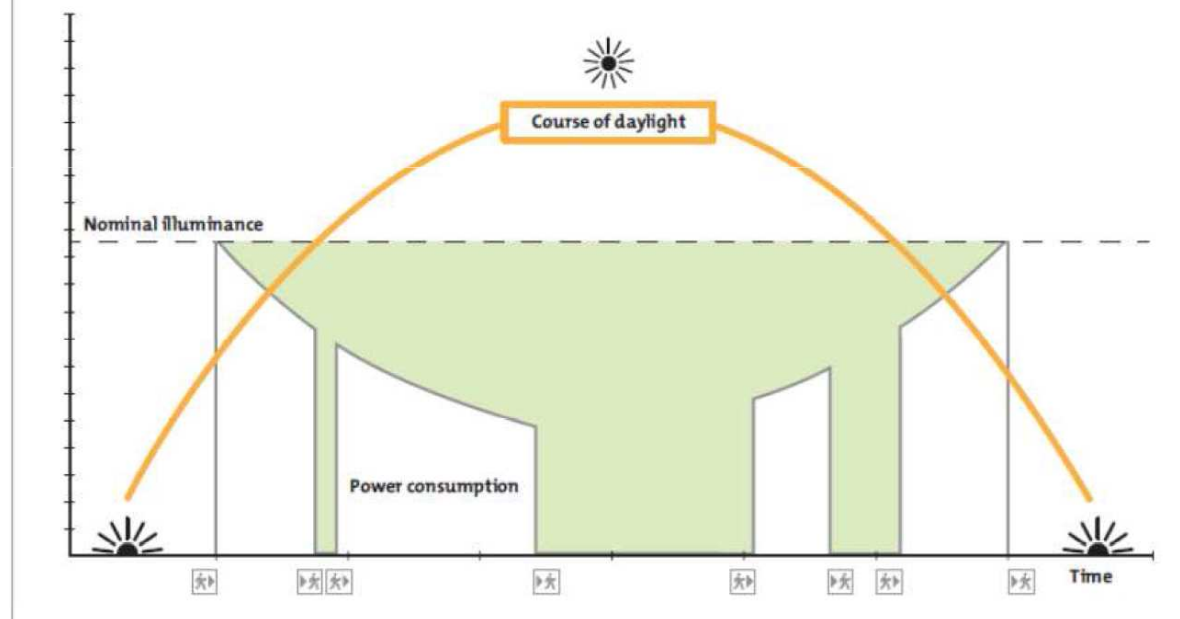
### Initial situation:

- Temporary use of areas
- Daylight entry



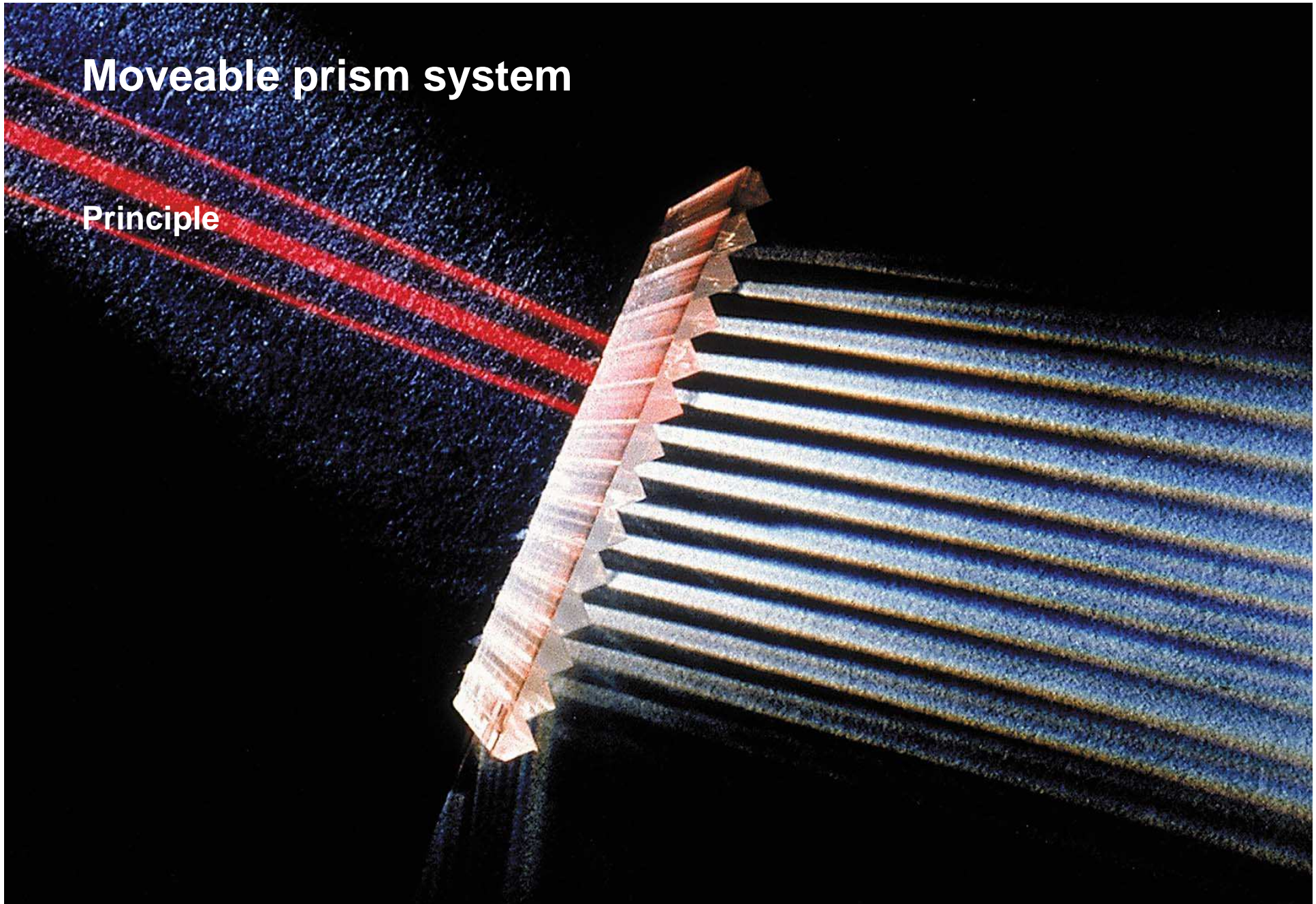
- Reaction with individual sensors, DALI light management system or integration in building management system
- Energy savings depend on structural conditions and daylight entry, approx. 10–60% (Source: licht.de)

### Options for saving – motion detection and daylight control



# Moveable prism system

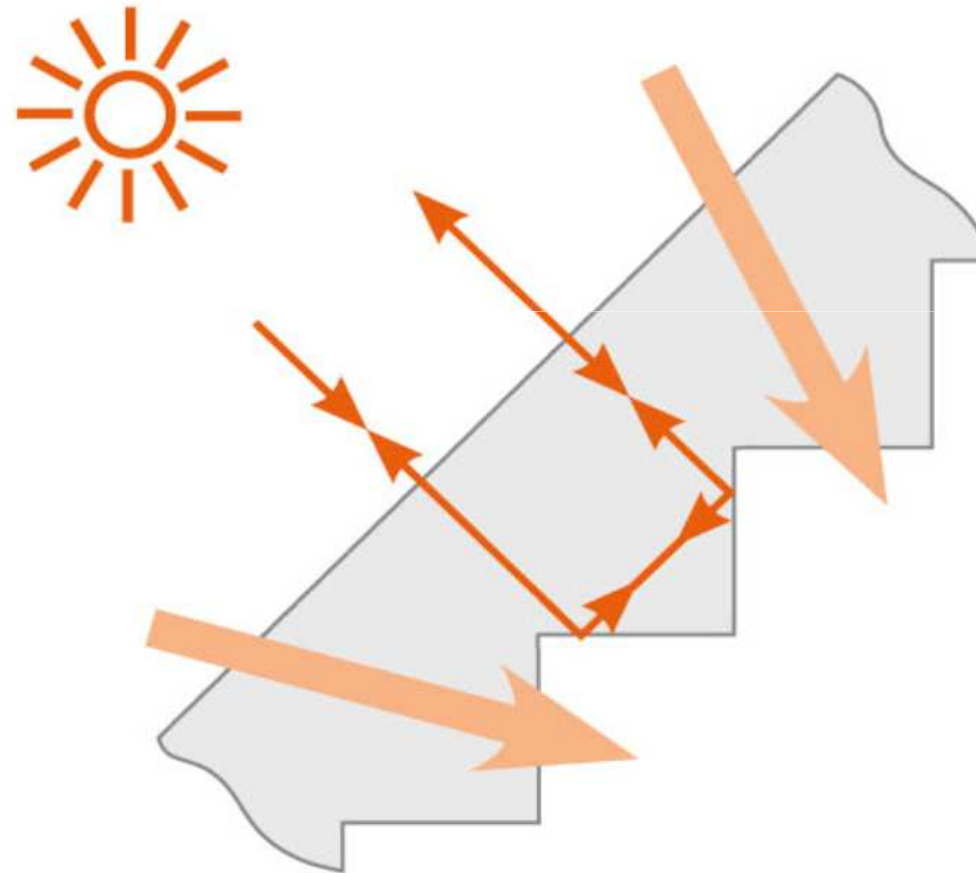
Principle



# Moveable prism system

---

## Functionality



# Moveable prism system

---

## Technical Data



**Dimensions** 310 x 750 x 12 mm

**Total energy transmission value**  $g < 12\%$

**Light transmission**

in sun shielding position  $\tau = 53\%$

in horizontal position  $\tau = 74\%$

**Pros:**

- highly translucent and effective sun protection
- high degree of transparency by turning of the prism lamellas
- automatic control
- high-value mechanical components

# Moveable prism system

## Emergency hospital Linz, Austria



Architect: Prof. Lintl & Moser Architects, Vienna, 2001-2005



# Moveable prism system

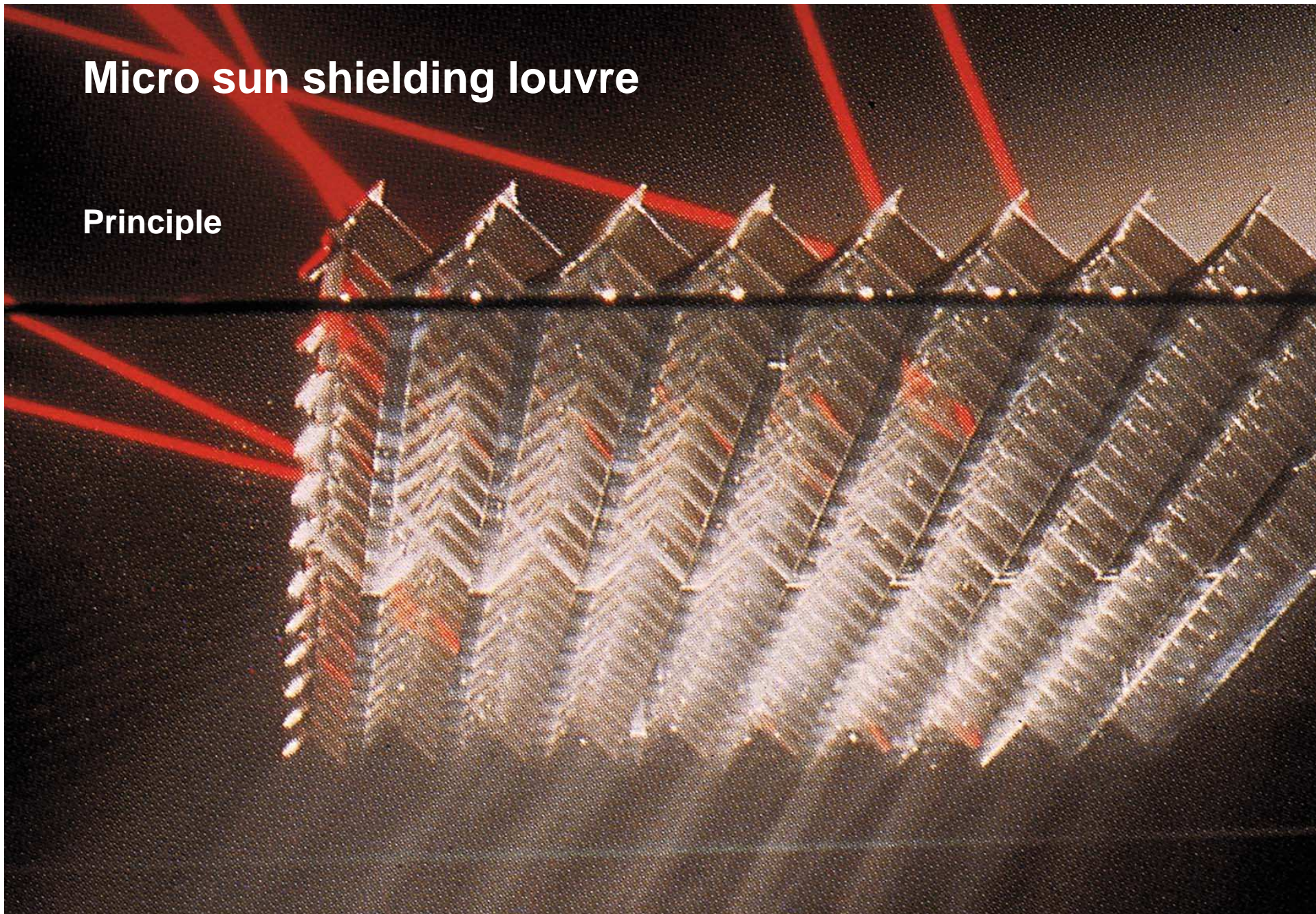
Emergency hospital Linz, Austria



Architect: Prof. Lintl & Moser Architects, Vienna, 2001-2005

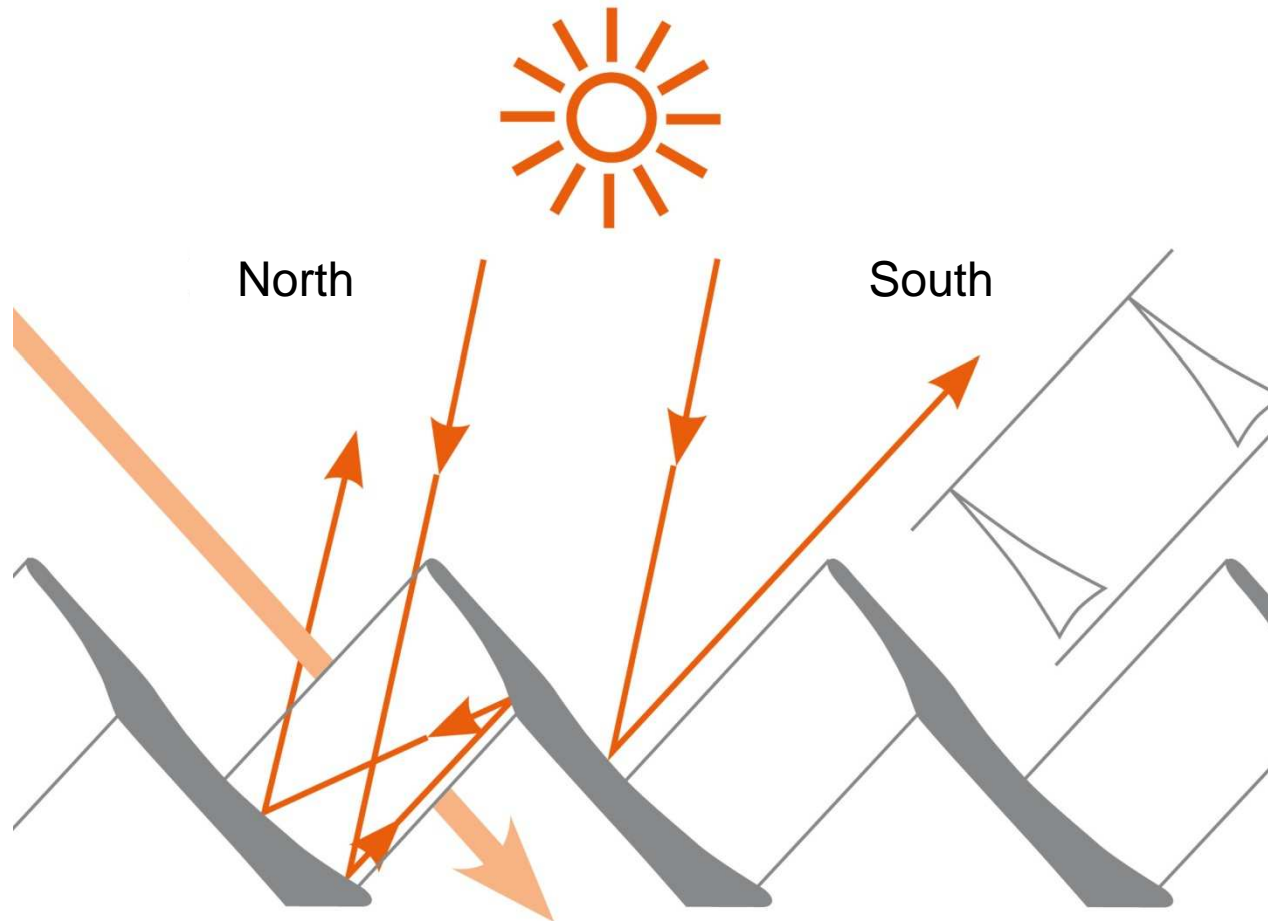
# Micro sun shielding louvre

Principle



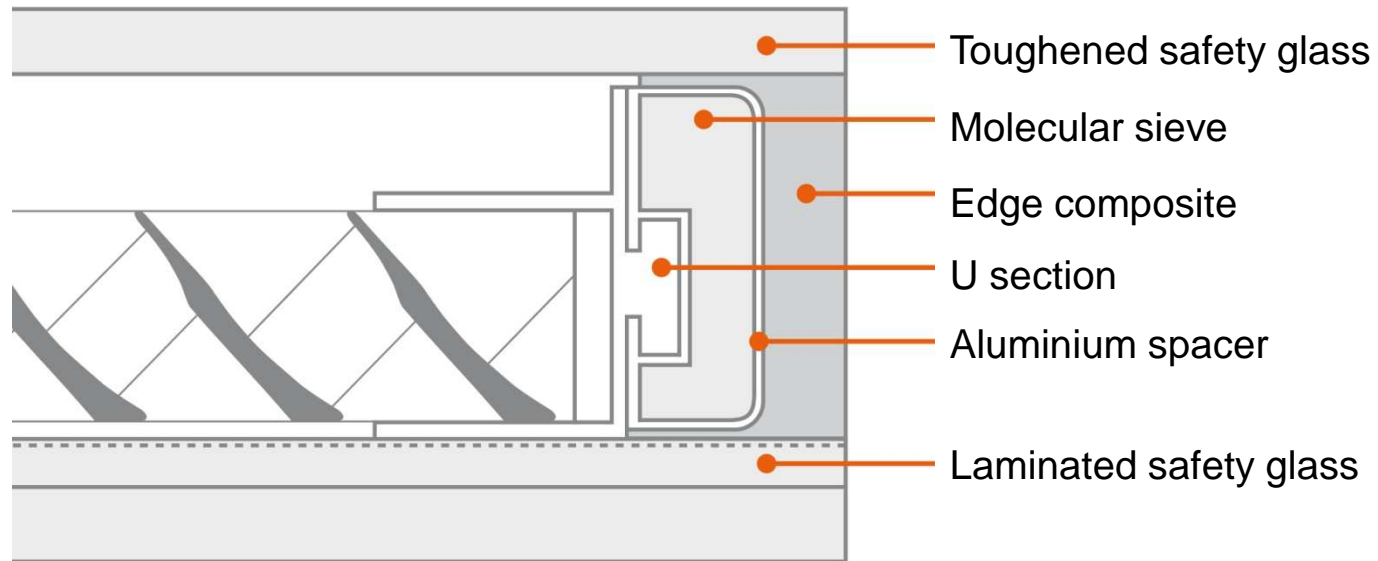
# Micro sun shielding louvre

## Functionality



# Micro sun shielding louvre

Securely integrated in glass



# Micro sun shielding louvre

## Technical Data



**Dimensions (max.)** approx. 2.20 x 3.00 m  
respectively approx. 1.50 x 4.00 m

**Airspace** 24 mm

**Total energy transmission value**  $g = 14\%$

### Light transmission

depending on the angle of incidence  $\tau = 0 - 55\%$   
diffuse  $\tau = 12 - 38\%$

**Thermal transmittance**  $U = 1.1 - 1.7 \text{ W/m}^2\text{K}$

**color rendering index**  $\text{CRI} > 97$

### Pros:

- highly translucent and effective sun protection
- no mechanical components
- low-maintenance
- excellent transparency towards the North

# Micro sun shielding louvre

ALDI Süd Futurestore, Rastatt, Germany



Architect: Finzel Architekten, Würzburg / Light Consultant: start.design, Essen

# Micro sun shielding louvre

ALDI Süd Futurestore, Rastatt, Germany



Architect: Finzel Architekten, Würzburg / Light Consultant: start.design, Essen

**Thank you for your interest.**

**Dipl.-Ing. Klaus Buntkiel-Kuck**

Application Business Development Manager  
Daylight Systems

[K.Buntkiel-Kuck@siteco.de](mailto:K.Buntkiel-Kuck@siteco.de)

