

SOLARDIM®-ECO

A Self-regulating Sun Protection Glazing Helps To Save Energy

Product Description

Description

The new **FORMGLAS "SOLARDIM®-ECO"** is a self-regulating sun protection glazing. Due to an increase of temperature caused by solar radiation **SOLARDIM®-ECO** changes from a clear to an opaque, light-diffusing state. In this state, incident solar and heat radiation are reflected partially. The switching process is reversible: If the temperature decreases below the switching temperature the window becomes clear again. In contrast to conventional smart windows **SOLARDIM®-ECO** needs no additional energy.

In summer, during periods of high solar radiation, **SOLARDIM®-ECO** contributes to a noticeable reduction of heat and to a well-balanced room climate. Air conditioning costs will be reduced. In winter, light and heat are mostly welcome to minimize the energy demands of heating and lighting. Thus, **SOLARDIM®-ECO** remains clear even when the sun is shining.

In addition, **SOLARDIM®-ECO** decreases glare and eye discomfort, harmful UV rays of the sun are absorbed.



Fig.1: Self-regulating sun protection glazing, left: 25 °C, right: 37 °C surface temperature.

Performance Data

Degree of Doping	Visible Transmittance [%]			Solar Transmittance [%]		
	off	on	Diff.	off	on	Diff.
no	90	90	0	85	85	0
low	86	69	17	81	68	13
medium	74	46	28	73	50	23
high	69	35	34	69	41	28

- **Glass Type 1** – laminated glass, 2 x 1 mm clear glass, resin layer = ~ 1.7 mm
- Normal-hemispheric transmittance
- Calculation of the transmittance values according to DIN EN 410
- Diff. = Difference

Glass Type	g Value		U Value [W/m²K]
	off	on	
1	0.78	0.59	5.74
2	0.69	0.51	2.72
3	0.53	0.37	1.13

- **Glass Type 1** – laminated glass, 2 x 1 mm clear glass, resin layer = ~ 1.7 mm, **Degree of doping = medium**
- **Glass Type 2** – outside: glass type 1, gap: 16 mm air, inside: clear glass, 4 mm
- **Glass Type 3** – outside: glass type 1, gap: 16 mm Argon, inside: low-e glass, 4 mm
- g value: DIN EN 410, U value: DIN EN 673

 <p>TILSE FORMGLAS GmbH Dammer Landstr. 1 D – 14715 Nennhausen OT Liepe Phone: +49(0)33876 - 40212 www.tilse.com e-mail: formglas@tilse.com</p> 	 <p>FRAUNHOFER IAP Dept. Chromogenic Polymers Volmerstr. 7B D - 12489 Berlin Phone: +49(0)30/6392 - 2034 www.thermochromic-polymers.com olaf.muehling@iap.fraunhofer.de</p>
---	---

Functional Principle

The new **FORMGLAS "SOLARDIM®-ECO"** consists of an optical active, thermotropic resin layer sandwiched between two glass panes. This resin layer is doped with spherical nanocapsules containing a mixture of compounds responsible for the thermotropic switching behaviour. In the off-state (e.g. 25 °C), the solar radiation passes directly through the resin layer: **SOLARDIM®-ECO** is transparent. Above the switching temperature (on-state, e.g. 40 °C) the thermotropic nanocapsules change their structure leading to scattering effects at the surface of the nanocapsules. As a result, **SOLARDIM®-ECO** becomes light-diffusing and up to 30 % of the solar radiation is reflected.

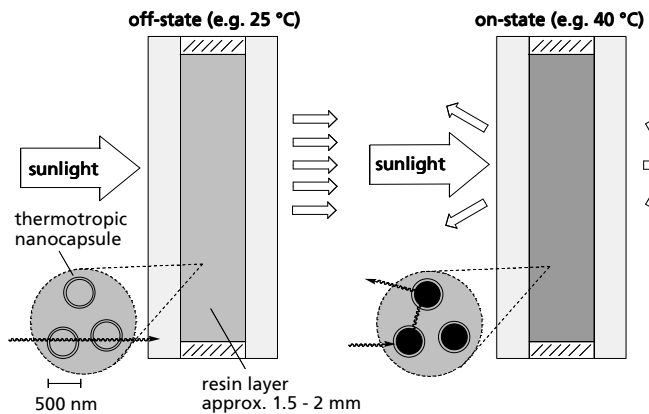


Fig. 2: Functional principle of a thermotropic laminated glass.

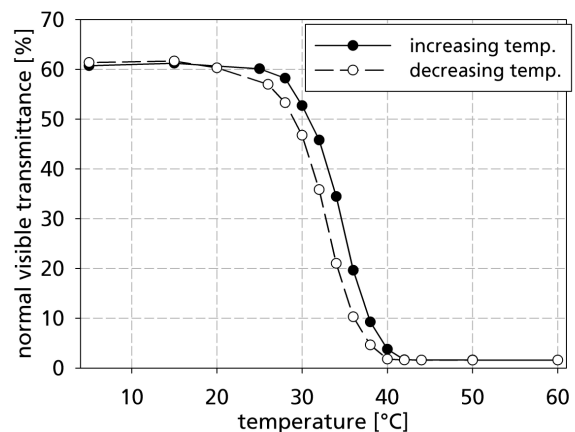


Fig. 3: Decrease of transmittance between 30 and 40 °C.

Key Features

- ✓ Self-regulating sun protection glazing
- ✓ Solar controlled, reversible change from a clear (off-) to a light-diffusing (on-)state
- ✓ Reflection of up to 30 % of solar radiation → Prevention of excessive heat during summer → Reduced air conditioning costs
- ✓ Efficient use of daylight during winter → Reduced heating and interior lighting costs
- ✓ Applications: protection against overheating and glare, blinds
- ✓ No additional energy consumption, no electrical power supply
- ✓ Degree of light scattering and switching temperature can be selected
- ✓ High long-time stability, ecologically sustainable, maintenance-free
- ✓ Compatible with existing technology, capable of being integrated into common glazings, no sealing frame
- ✓ Combination with an individual switching behaviour is possible

This work is funded by the **Bundesministerium für Wirtschaft und Technologie (BMWi)**.

 <p>TILSE FORMGLAS GmbH Dammer Landstr. 1 D – 14715 Nennhausen OT Liepe Phone: +49(0)33876 - 40212 www.tilse.com e-mail: formglas@tilse.com</p> 	 <p>FRAUNHOFER IAP Dept. Chromogenic Polymers Volmerstr. 7B D - 12489 Berlin Phone: +49(0)30/6392 - 2034 www.thermochromic-polymers.com olaf.muehling@iap.fraunhofer.de</p>
---	---