



GEWE-therm[®] Insulating Glass

SMALL INPUT – BIG IMPACT

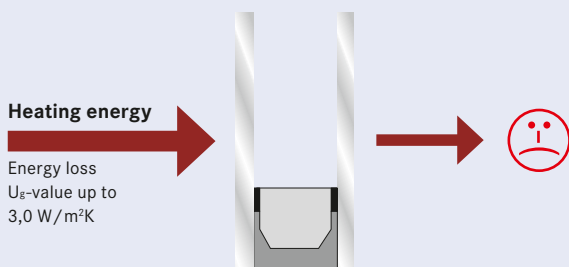
High-quality thermal insulation of structural components is one of the key topics in discussions on climate change and energy saving.

The SCHOLLGLAS group is offering highly effective, energetic, insulating glass under the GEWE-therm[®] brand for decades. Outstanding heat transmission values are the basis of a wide entire range of functional glass. The possible uses are as diverse as the number of combinations. Whether for floor-to-ceiling glazing in your own new, chic home or for modern facade architecture, insulating glass is and will remain a great high-tech product.

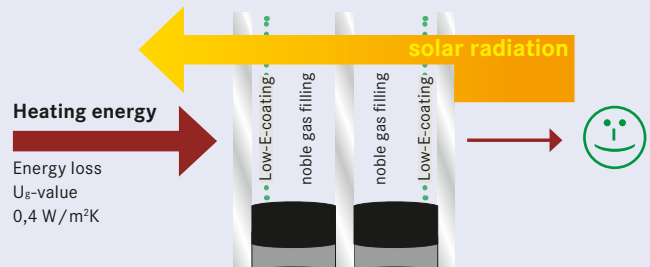
Benefits of energy rehabilitation

- Heating savings
- CO₂-minimisation / climate protection
- Increase in value of the building
- Greater living comfort

Double insulated glass (traditional)



Triple insulated glass



Triple pane insulating glass will replace today's double pane glazing in the medium-term.



SCHOLL
GLAS



Residential estate PolygonGarden in Berlin – due to GEWE-therm® a quiet haven in the middle of urban life.

TRANSPARENCY WITH ADDED VALUE – TRIPLE PANE INSULATING GLASS FOR WINDOWS AND FAÇADES

While insulating glass had an U_g value of around $3.0 \text{ W/m}^2\text{K}$ up to the mid 1990s, this value has now improved with modern insulating glass to approximately $1.0 \text{ W/m}^2\text{K}$ and even to around $0.7 \text{ W/m}^2\text{K}$ as a standard for triple pane insulating glass. This means an improvement of energy efficiency of up to 75 percent. At the same time, however, cosiness increased and hence living comfort along with it. Solar energy

production in particular plays a pivotal role when planning energy-efficient buildings, and is often underestimated. Especially in autumn and spring, the heating period will be shortened if uncoated insulating glass is replaced by coated insulating glass. This means that approximately 20 litres of heating oil can be saved per square metre of window area, and it even means 30 litres with triple-pane glazing.

Benefits of triple pane glazing

- insulates considerably better than conventional double pane insulating glass and achieves values that are comparable to a well-insulated outside wall
- stops heat losses by using intelligent attachments in combination with innovative coatings so that U_g values of 0.8 to $0.4 \text{ W/m}^2\text{K}$ can be reached
- can be configured as functional insulating glazing (e.g. protection against sun, noise or break-ins)
- provides a heat gain from solar radiation for free
- active environmental protection
- effectively combats the rising energy costs for heating and reduces the CO_2 emissions
- provides cosy living comfort



Today modern GEWE-therm® glazing for windows and facades fulfills several functions at the same time: It provides daylight and view, is part of passive solar power generation, has low heat losses, and high air exchange rates are cooling down the building.

The proportion of glass surfaces on facades has increased constantly over the past few years and has become indispensable in modern urban development. Thanks to tremendous progress in structural glass construction, today multifunctional insulating glass is also already taking over numerous safety-relevant tasks. The spectrum of GEWE-therm® insulating glazing with a great variety of special functions is a true problem solver in modern, energy-efficient architecture. Planners focus on sun protection as an easy way to combine functional and design

material at the same time, mainly for commercial construction. The key words in sun protection glass are absorption and reflection. Depending on the configuration or alternatively on the desired level of efficiency, modern sun protection glass can keep out 50 to 80 percent of the solar energy finally causing a reduction of room temperature. At the same time, the glass allows between 50 to 70 percent of the visible sunlight to get into the room. Principally, this means: The larger the glass surface, the higher the demands on the sun protection glass.

Triple pane insulating glass is the glass of the future. The effectiveness is achieved through coatings made of metals and metal oxides, fillings with noble gas and a thermally optimised edge bond.

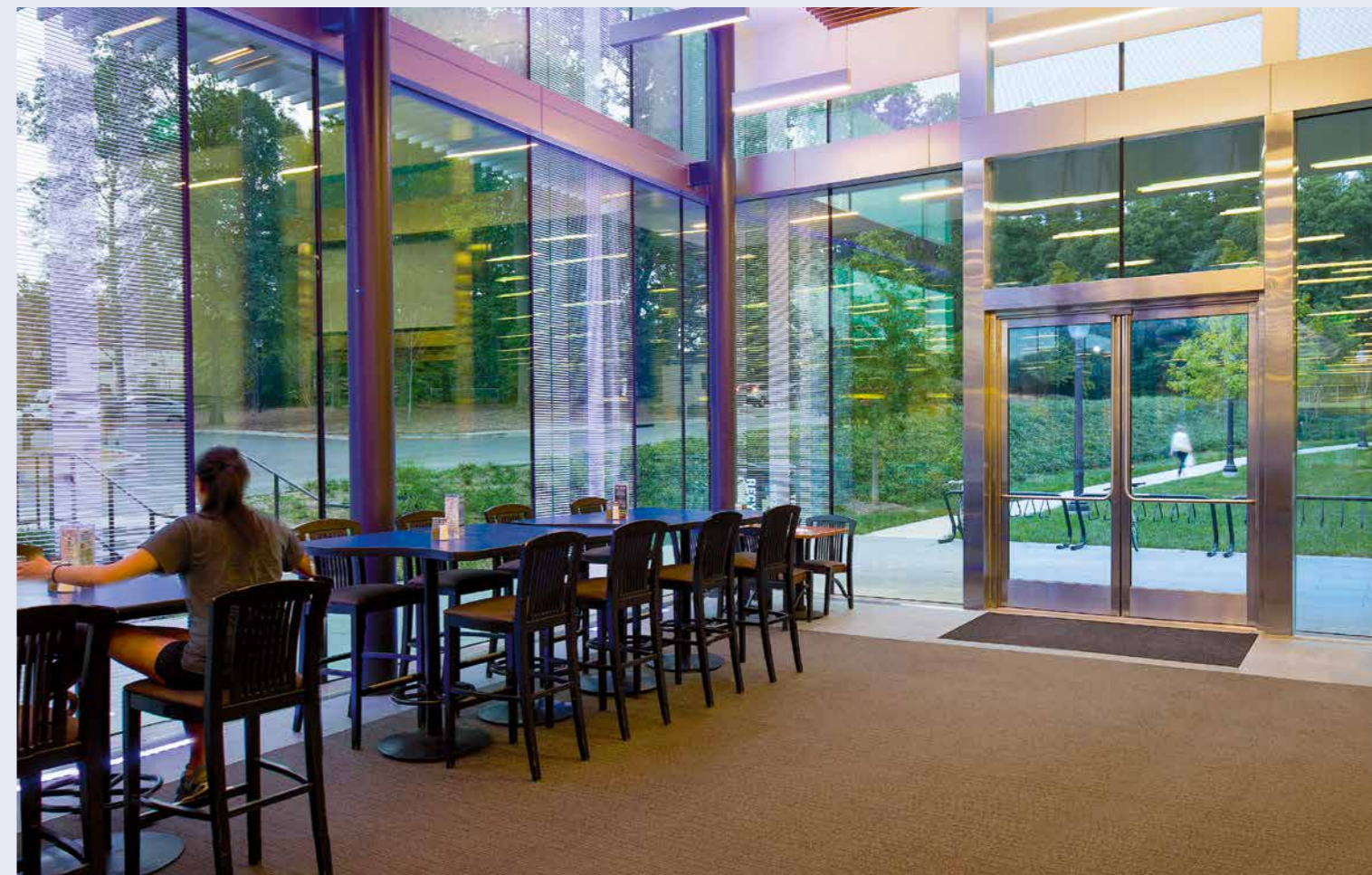


Above: Schuppen Eins in Bremen – a historical warehouse with modern GEWE-therm® sun insulated glasses. Below: the built-in GEWE-therm® creates beautiful views from inside as well as from outside.

Interesting in any combination

A new generation of high-quality GEWE-therm® glass with integrated combinable functions, such as heat and sun protections, noise protection and break-in protection – depending on what you need:

- **GEWE-therm® safe**
Safety insulating glass
- **GEWE-therm® sun**
protects against solar excessive impact heat
- **GEWE-therm® phon**
for noise protection insulating glass
- **GEWE-therm® safe alarm** (VdS approval number G107018)
insulating glass with an alarm function
- **GEWE-therm® multi**
thermal / sun / noise / break-in protection integrated in one insulating glass



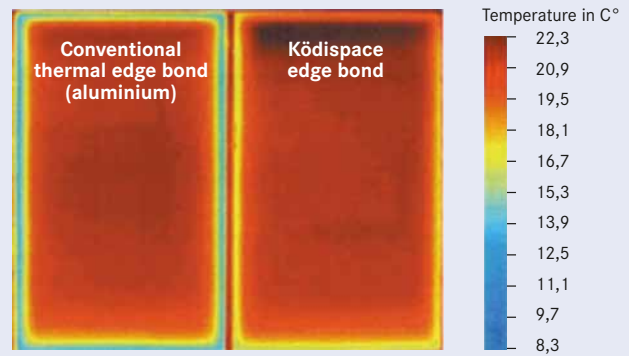
»WARM EDGE« SPACERS – RESOURCE PROTECTION WITH MODERN EDGE BOND SYSTEMS

In addition to the window frame material, the heat transfer coefficient of the glass and the heat transfer of the edge bond system are significantly responsible for the thermal insulation properties of the window. The SCHOLLGLAS Group offers a whole range of edge bond systems

with improved material properties for insulating glazing. These »warm edge« spacers are a clear plus when it comes to the overall energy balance of a building. The big advantage: With »warm edge« edge bond systems heat cost savings of up to five percent are possible.



Thermal bridges in comparison



Infrared picture

Left: GEWE-therm® sun insulated glass installed in Schuppen Eins in Bremen/Germany, Maisonette-Lofts with parapets on all gallery floors: GEWE-safe® Laminated safety glass

Psi values [W/m × K] in comparison – triple pane insulating glass standard design with »warm edge« spacers

Spacer types	Metal frame (thermally separated)	Plastic frame	Wooden frame	Wooden/ Metal frame
Chromatech Plus	0,060	0,048	0,051	0,056
Chromatech Ultra F	0,043	0,037	0,038	0,041
Ködispace	0,038	0,034	0,034	0,036
Nirotec AHSZ 017	0,061	0,048	0,052	0,057
Swisspacer Ultimate	0,031	0,030	0,029	0,030
Multitech	0,030	0,030	0,028	0,030
TGI	0,044	0,038	0,039	0,042
Thermix TX.N plus	0,045	0,039	0,040	0,043
Aluminium*	0,094	0,065	0,076	–

* Comparable value »cold edge system«

Source: These are the current data sheets. However, they are subject to change service (i. e. without liability).



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