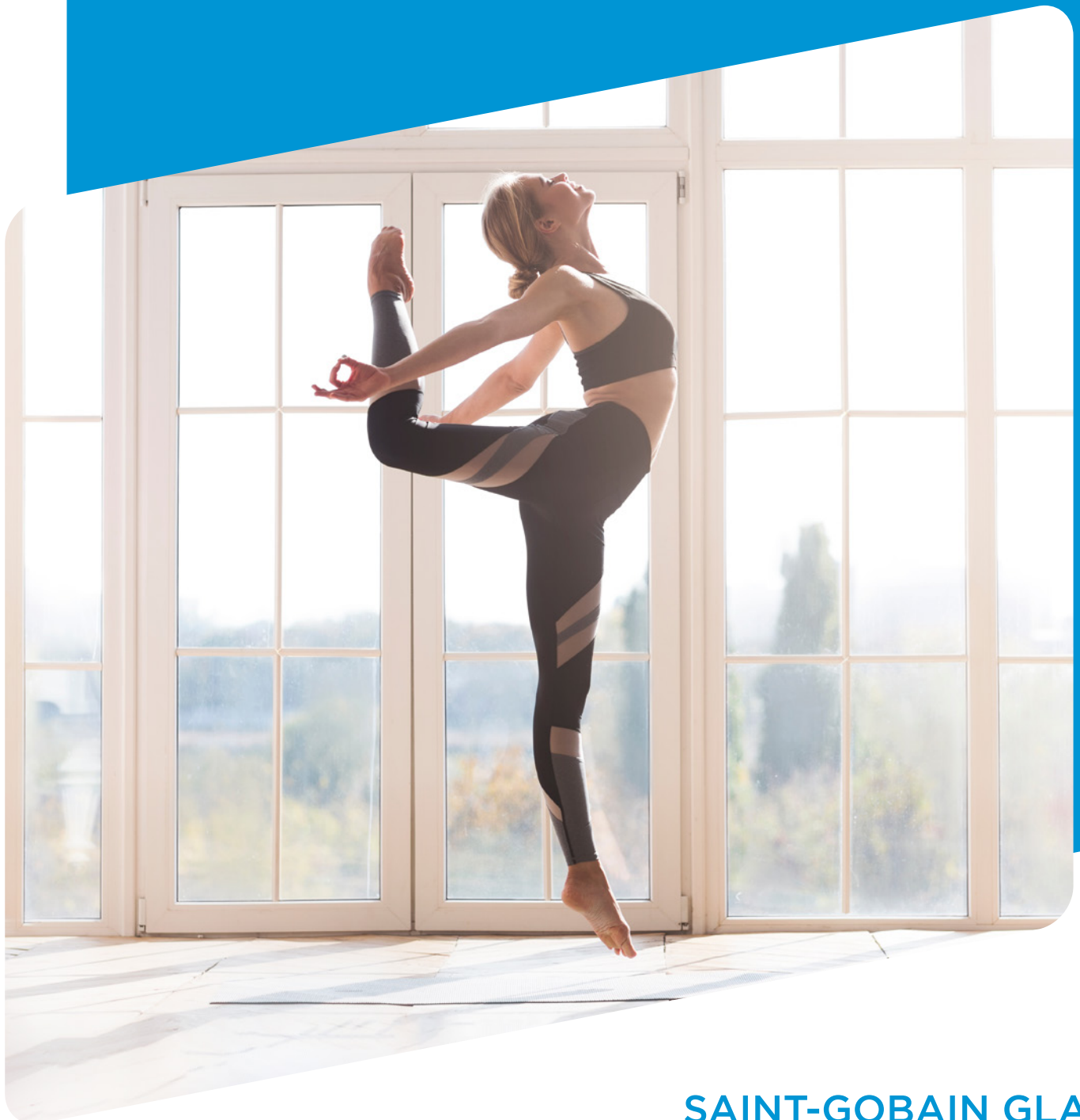


# LIGHTWEIGHT GLASS

Slender design - full functionality





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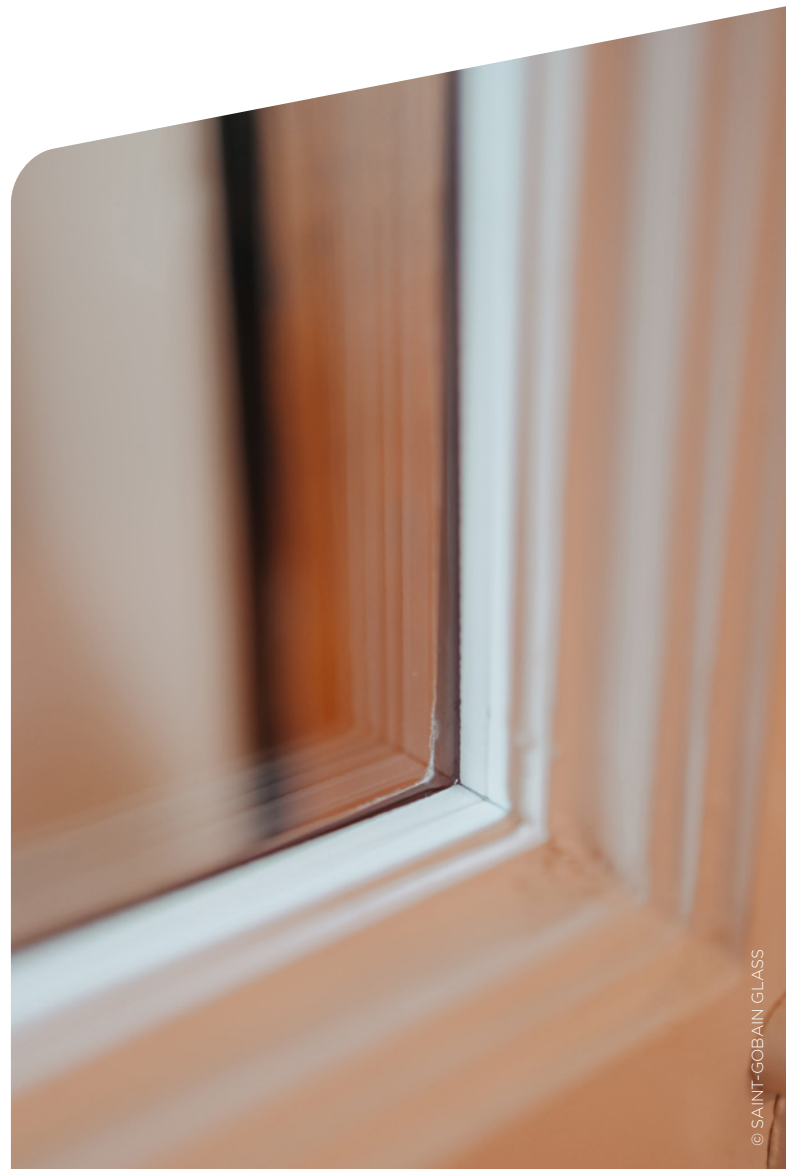
# INSULATING GLASS MADE EASY

With  $U_g$  values of 0.5 to 0.7 W/m<sup>2</sup>K, triple glazing is a convincing answer to the requirements of modern, energy-saving construction. However, they are thicker and, above all, considerably heavier than the double-glazed units that were common in the past. The higher material input is not only a greater burden for glaziers, window fitters and installers, but also for the environment, since the higher proportion of glass leads to higher material and energy consumption.

Lightweight glass from the CLIMATOP® LIGHT and CLIMATOP® EXTRA LIGHT range provide a remedy, as they enable particularly slim and lightweight glazing with comparable glass-specific characteristics. The lower weight simplifies the handling of the glass

in the workshop and during installation. The lower use of materials in lightweight insulating glass conserves resources and reduces CO<sub>2</sub> emissions for the glazing. CLIMATOP® LIGHT and CLIMATOP® EXTRA LIGHT thus make a direct contribution to sustainability and offer glass processors and window manufacturers the opportunity to prepare for a decarbonised future.

Lightweight insulating glass can be used wherever triple glazing is also installed. The same requirements apply to the light insulating glass, which apply to conventional glazing.



# LIGHT, LIGHTER, CLIMATOP® LIGHT

Even in the simple basic configuration of a triple glazing without additional safety requirements, weight savings of over 30% are possible when using thin glass. The difference becomes even clearer when safety glass is required: here, weight savings of over 40% can be achieved with CLIMATOP® EXTRA LIGHT. This enables easier handling of the glass in the workshop and during installation – a weighty advantage for workers from the field of production and installation of windows and glass doors.



## Weight reduction

Glass size (cm)	Surface (m <sup>2</sup> )	Glass weight (kg) 4-12-4-12-4	Glass weight (kg) 3-12-2-12-3	Difference (kg)
140 x 200	2.80	84.0	56.0	-28.0
90 x 200	1.80	54.0	36.0	-18.0
90 x 120	1.08	32.4	21.6	-10.8
60 x 80	0.45	14.4	9.6	-4.8

For comparison, the weight per unit area of CLIMATOP® XN EXTRA LIGHT triple glazing is in the order of magnitude of earlier standard double glazing. The recommended maximum size is 1400 x 2200 mm. Around 85 % of common window and door applications are in this size range.

	Standard triple glazing	CLIMATOP® LIGHT	CLIMATOP® EXTRA LIGHT
Glass configuration	44.2 / 12 / 4 / 12 / 4	33.2 / 12 / 3 / 12 / 3	22.2 / 12 / 2 / 12 / 3
Glass weight in kg/m <sup>2</sup>	41	31	23

By reducing the workload of the workers at the installation site, assembly times can be shortened and the construction site process can be made more efficient.

Lightweight insulating glass, however, also offers optimisation for the frame profiles and fittings, as they are subjected to less stress. The advantage is obvious: longer use and service life of the window and glass door.

# MULTIFUNCTIONAL APPLICATION

## Sound insulation

The sound insulation performance of windows with lightweight glass can be considered comparable to the sound insulation performance of windows with conventional insulating glass. On the basis of the test standards, comparative measurements were carried out between windows with CLIMATOP® LIGHT insulating glass and windows with conventional triple glazing. The results obtained showed comparable to better sound insulation values ( $R_{w,P}$ ) for windows with light insulating glass.

	Standard triple glazing	CLIMATOP® LIGHT	CLIMATOP® EXTRA LIGHT	CLIMATOP® EXTRA LIGHT
Glass configuration	4/14/4/14/4	3/14/3/14/3	3/14/2/14/3	4/14/2/14/3
$R_{w,P}$ (C;Ctr) in dB*	36 (-2;-5)	34 (-2;-6)	35 (-2;-6)	38 (-2;-7)

\*Sound reduction index taking into account spectrum matching values C and Ctr (DIN EN ISO 717-1)

## Thermal insulation

The energy efficiency requirements for window and façade constructions have made triple glazing a standard product for new buildings and window renovations. In terms of thermal insulation, the triple insulating glass units of the CLIMATOP® LIGHT series, which are only 33 mm thick, achieve  $U_g$  values of 0.5 to 0.7  $W/m^2K$ , depending on the coating and gas filling. This ensures a contemporary high level of thermal insulation. Due to the lower glass thickness, even greater light input and higher g values for more solar heat gains are possible.

	Standard triple glazing	CLIMATOP® LIGHT	CLIMATOP® EXTRA LIGHT
Glass configuration	4 XN/12/4/12/4 XN	3 XN/12/3/12/3 XN	3 XN/12/2/12/3 XN
LT value*	73 %	74 %	74 %
g value*	53 %	54 %	54 %
$U_g$ value**	0.7 $W/m^2K$	0.7 $W/m^2K$	0.7 $W/m^2K$

\*according to EN 410 \*\*according to EN 673



## Safety glass

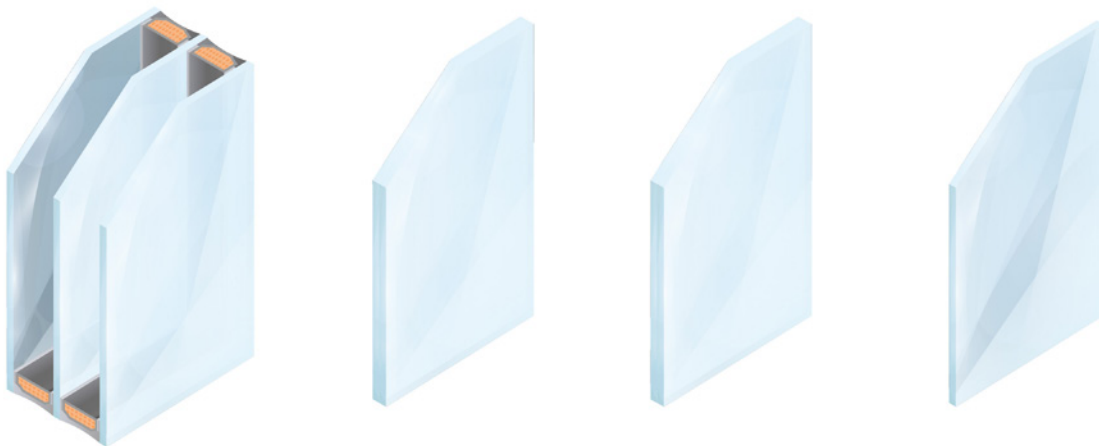
High standards are also achieved in terms of safety. Thin glass can be processed into toughened safety glass and laminated safety glass without having to forego the advantages of lower weight:

- Laminated safety glass can be produced with a total glass thickness of 4 mm. It weighs only 10 kg/m<sup>2</sup>, a third less than conventional laminated glass with 6 mm and 15 kg/m<sup>2</sup>
- SECURIT® LIGHT, the lightweight toughened safety glass, is even only 3 mm thick and weighs only 7.5 kg/m<sup>2</sup>
- If required, triple glazing can be produced for security windows of resistance class RC-2: STADIP® PROTECT P4A LIGHT, the laminated safety glass of class P4A according to DIN EN 356, is suitable for the production of burglar-resistant windows of class RC-2.



© SAINT-GOBAIN GLASS

## Safety glasses of the CLIMATOP® LIGHT series



**Basic configuration**  
CLIMATOP® LIGHT

3-12-3-12-3  
22.5 kg/m<sup>2</sup>  
**-7.5 kg/m<sup>2</sup>**  
**-25%**

**Laminated glass P4A**  
STADIP® P4A LIGHT

6 mm  
12 kg/m<sup>2</sup>  
**-9 kg/m<sup>2</sup>**  
**-43%**

**Laminated glass**  
STADIP® 22.2 LIGHT

5 mm  
11 kg/m<sup>2</sup>  
**-5 kg/m<sup>2</sup>**  
**-31%**

**TSG**  
SECURIT® 3 mm LIGHT

3 mm  
7.5 kg/m<sup>2</sup>  
**-2.5 kg/m<sup>2</sup>**  
**-25%**

# MAKING RENOVATION AND NEW CONSTRUCTION SUSTAINABLE

With these outstanding technical values, the thin glasses are suitable for all common applications in new buildings and renovation. Especially in residential construction, depending on the installation situation, glass sizes of up to 1400 x 2200 mm and thus around 85% of the usual installation dimensions can be offered.

## Small weight, great effect

Thin glass and the light insulating glass made from it make a direct contribution to the sustainability of buildings. The use of materials is significantly reduced – and this throughout the entire life cycle of a product, from the extraction of raw materials to production, transport and processing. The reduced use of materials also means that significantly less energy is consumed in the individual life phases. The CO<sub>2</sub> emissions for glazing are reduced compared to conventional triple glazing.

CLIMATOP® LIGHT and CLIMATOP® EXTRA LIGHT series equip your range for a decarbonised building sector.



	Standard triple glazing	CLIMATOP® LIGHT	CLIMATOP® EXTRA LIGHT
<b>GLASS CONFIGURATION WITH THERMAL INSULATION</b>			
Configuration	4 XN/12/4/12/4 XN	3 XN/12/3/12/3 XN	3 XN/12/2/12/3 XN
Carbon footprint* in kg, CO <sub>2</sub> equiv/m <sup>2</sup>	51	42	39
<b>GLASS CONFIGURATION WITH LAMINATED SAFETY GLASS</b>			
Configuration	44.2/12/4/12/4	33.2/12/3/12/3	22.2/12/2/12/3
Carbon footprint* in kg, CO <sub>2</sub> equiv/m <sup>2</sup>	69	56	47

\*Carbon footprint (GWP) is calculated with Calumen based on EN 15804+A2

## For more design freedom

In renovation projects, building owners, architects and window manufacturers benefit from the use of lightweight glass. With the LIGHT series, older double-glazed units can now be replaced by slim, highly insulating triple-glazed units. This means no compromises in appearance: narrow face widths for the profiles without additional loads on the fittings. A simple replacement of the glazing is also conceivable. Depending on the situation, the old frames can even be reused. This is also an important argument for the protection of listed buildings.

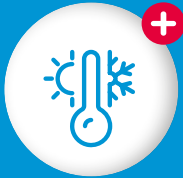
	Standard triple glazing	CLIMATOP® XN EXTRA LIGHT
Configuration	4 XN/12/4/12/4 XN	3 XN/12/2/12/3 XN
Thickness in mm	36	32

**Did you know?**

With Calumen you can calculate the CO<sub>2</sub> footprint of insulating glass. Try it out now at: <https://calumen.com/>

# LIGHTWEIGHT GLASS

Not a heavy decision



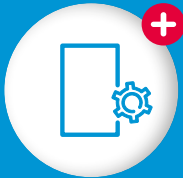
## *Better handling*

Weight savings of over 40% possible and thus easier handling when glazing and installing windows and glass doors – especially when renovating windows, where the elements usually have to be transported manually.



## *More sustainability*

Material use and energy consumption are significantly reduced over the entire life cycle. This can be significant for a desired certification, for example according to DGNB or BNB!



## *Full functionality*

The thin glass fulfils all current physical building requirements, e.g.  $U_g$  values of 0.5 for triple glazing. The lower glass thickness leads to a higher daylight transmission and to more solar heat gains.



## *Beautiful look*

Thin glass enables visually slimmer profiles. Building owners and architects gain additional design freedom.



**SAINT-GOBAIN  
GLASS DEUTSCHLAND GmbH**

Nikolausstraße 1  
D-52222 Stolberg  
glassinfo.de@saint-gobain.com  
www.saint-gobain-glass.de

For more information about lightweight glass, visit our website at  
[www.saint-gobain-glass.de](http://www.saint-gobain-glass.de).  
And if you have specific questions about your individual planning task,  
simply ask us directly about your options.

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