

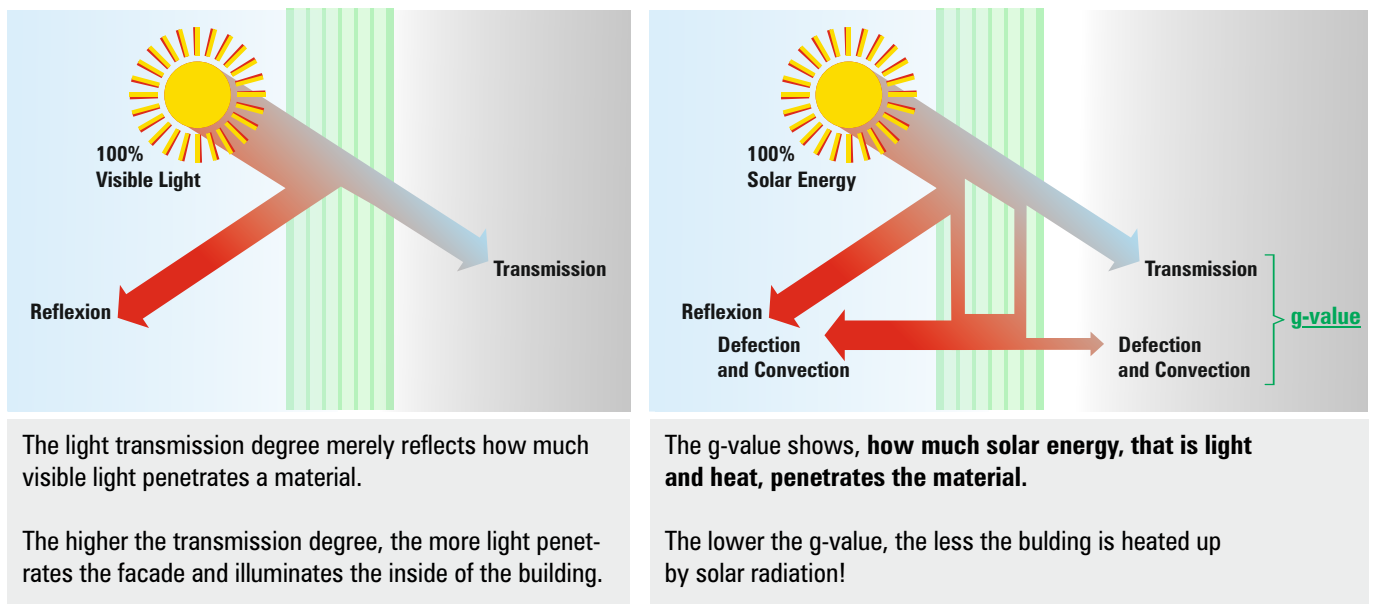
Total Energy Transmittance (g-value) of twin-walled fibreglass sheets made by Butzbach

Performance required for glazings (Facades, Doors etc.)

- Thermal Insulation:** The building is supposed to transmit a minimum of energy to the exterior
→ Reflected by the U-Value
- High Translucency:** Energy saving by waiving artificial lighting
→ Reflected by Degree of Transmission
- Light Diffusing Effects** Deep and even illumination of the interior combined with prevention of blinding effect
- Solar Protection:** Minimized heating of the interior even with permanent solar radiation
→ Reflected by the Degree of Energy Transmittance / g-value

Definition g-value

Sunlight always causes application of energy into the building when translucent materials are used. The g-value reflects the extent of that application within a certain period of time.



Both values are expressed in per cent.

Definition Selectivity Figure:

The selectivity number shows the relation between translucency and total energy transmittance (optimum situation: high translucency, low g-value)

$$\text{Selectivity figure} = \frac{\text{Light Transmission in \%}}{\text{g-value in \%}}$$

→ A selectivity > 1 is evaluated very good and means: despite optimal light transmission relatively few energy reaches the interior of the building.

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Test Results:

The test has been made complying with the „direct method“ (the entire component is tested Standard procedure: here the single parts are being measured and the values then are allocated)

The measurement is carried out with vertical solar radiation (then the strongest energy transmittance appears), this means only test results which relate to vertical radiation are significant)

Testing Institute	Bartenbach Institut (in 1998)	Fraunhofer Institut (in 2011)
Tested Element	Fibreglass 40 mm Colour: emerald-green 2 insertion foils	Fibreglass 60 mm Colour: brilliant 5 insertion foils
Testing Method	Direct method	Direct method
g-value	42 %	35 %
Selectivity figure (Light transmission/g-value)	$\frac{60\%}{42\%} = 1,4$	$\frac{46\%}{35\%} = 1,3$

- Two independent test results with congruent results are available
- Both values bear comparison with solar protection glazing
- No requirement for additional shading systems or air condition
- Very good selectivity figure

Price comparison VARIOPLANplus with competitive systems:

System	VARIOPLANplus	Thermal Insulation Glazing	Solar Protection Glazing (2walls)
Characteristics	Butzbach Fibreglass 60 mm	Twin-walled thermal insulation Glazing, System Schüco Provides practically no solar protection, this means additional shading systems required	System Schüco, in the region of Butzbach fibreglass 60 mm with Comparable U-value No additional shading systems Required
U-value	1,1	1,1	1,1
Price structure	280 - 350 €/m ² depending on zzgl. surface area and grid, incl. installation ex works	Incl. sunshade appr. 20% above VARIOPLANplus	Pricewise alike VARIOPLANplus

g-values of Butzbach-sheets in comparison to competitive products

Butzbach Fibreglass 40 mm,
2 insertion foils:
42 %

Butzbach Fibreglass 60 mm,
5 insertion foils:
35 %

Synthetic Double Glazing:
64-78 %⁽¹⁾

Thermal Insulation Glazing,
twin-walled:
54-64 %⁽¹⁾

Thermal Insulation Glazing,
triple-walled:
48-52 %⁽¹⁾

Solar Protection Glazing
(twin-walled):
26-46 %⁽¹⁾

Clear Polycarbonate-multi-layer sheets:
62-81 %⁽¹⁾

⁽¹⁾ values of competitive products acc. to DIN V 18599-4:2007-02

Considering the further advantages of Fibreglass (lightweight property, no blinding due to light diffusion) there are further arguments pro using VARIOPLANplus and fibreglass doors.