The heating of glass can take place through conduction, convection (warm air contacting glass) or radiation. Whilst the behaviour of glass with conduction or convection is relatively consistent, the response of glass to radiant heating can be significantly influenced by glass colour, the presence of any coatings and composition.

BODY TINTED GLASS

Body tinted glasses are coloured for solar control and/or aesthetics. The presence of the elements to add colour to the glass, for example; iron for green and copper and cobalt for blue, will also increase the solar energy absorbance. The below table shows the solar energy absorptance, measured and calculated in accordance with EN 410:2011 [1] for SGG PLANICLEAR and SGG PARSOL Body Tinted float glasses.

Table 1 - Solar Energy Absorption for Body Tinted Float Glass

Glass Type	Solar Energy Absorptance (%)
4 mm SGG PLANICLEAR	5.2
4 mm SGG PARSOL Green	40.9
4 mm SGG PARSOL Bronze	33.9
4 mm SGG PARSOL Grey	37.1

When considering the temperature increase in a piece of glass due to incident radiation, the absorption will directly influence the increase in temperature.

COATED GLASS

SGG PLANITHERM low emissivity and SGG COOL-LITE solar control products both function by selectively reflecting infrared radiation. Thermal insulation is improved by reflecting long wave infrared radiation to the interior and, in the case of SGG COOL-LITE solar control is achieved by reflecting solar radiation away from the building.

With the addition of SGG PLANITHERM or SGG COOL-LITE coatings to our standard SGG PLANICLEAR substrate, there will also be some inherent change to the absorption, and influence on other panes in the insulating glass unit. The below table shows the solar energy absorptance, again as per EN 410:2011, for unit configurations with two 6 mm panes, with and without coatings.

Table 2 - Solar Energy Absorption for Coated Glasses Within IGUs

6-(16)-6 Construction with Coating	Solar Energy Absorptance (%)	
	Outer Pane	Inner Pane
None	7.9	5.7
SGG PLANITHERM ONE T (Surface 3)	10.4	9.2
SGG COOL-LITE SKN 176 II (Surface 2)	30.0	1.3

As can be seen from the above, the SGG PLANITHERM ONE T coating on the inner pane (Surface 3) will reflect some solar energy back to the outer pane, increasing the amount of energy absorbed, and will also result in more absorption on the inner pane.

The SGG COOL-LITE SKN 176 II coating on the outer pane (Surface 2) is designed to reflect solar energy back to the outside. In doing so, it effectively shields the inner pane from solar radiation, but will also absorb more solar energy itself, as the reflected portion of solar energy is passing through the glass thickness for a second time.

LAMINATED GLASS

PVB interlayers, included in our SGG STADIP range, even non-coloured, will increase the absorption of solar energy within a glass pane. The below table shows the increasing solar energy absorptance with the presence of a single thickness (0.38 mm) interlayer, and a quadruple (1.52 mm) thickness interlayer.

Table 3 - Solar Energy Absorption for Laminated Glass

Glass Type	Solar Energy Absorptance (%)
8 mm SGG PLANICLEAR	9.6
8.4 mm SGG STADIP	16.8
9.5 mm SGG STADIP	21.7

REFERENCES

[1] European Committee for Standardization, EN 410:2011 - Glass in building - Determination of luminous and solar characteristics of glazing, CEN, 2011.