Spandrels and shadow boxes are typically used to conceal regions of the building containing utilities (pipes/cables) or structural elements, whilst still maintaining the appearance of a full glass façade. Spandrel units will typically have an opaque pane, and insulation in contact with the rear of the glazing unit, either adhered to the glass or secured in metal trays.

Shadow boxes differ from spandrels in that the glass will typically be transparent, with a coated sheet material, or other light blocking structure, situated at a distance behind, in order to give the appearance of depth.

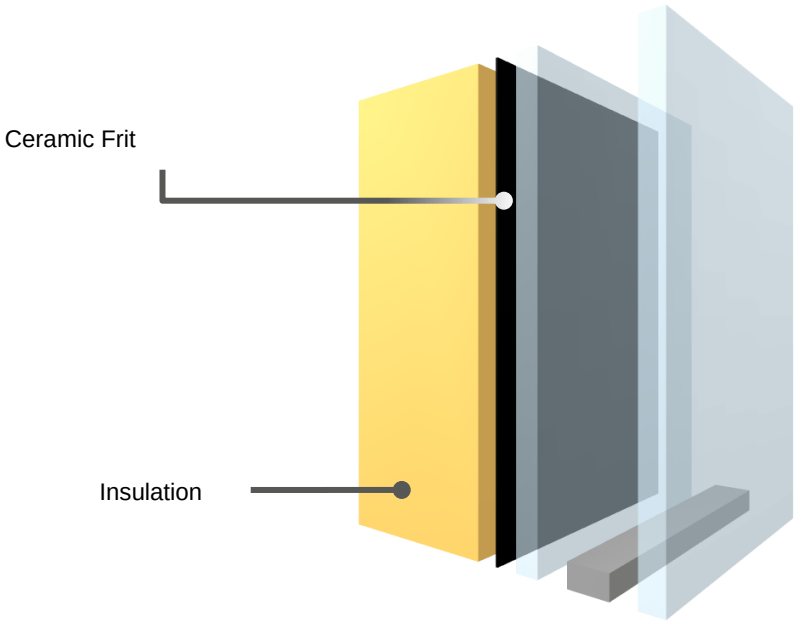

Figure 1 - Spandrel Configuration

SPANDREL PANELS

A fully fritted opaque pane of glass will have a significantly higher absorptance than a clear pane. In addition, within an IGU, light reflected to the exterior out by a fritted pane, will also increase the absorptance on the outer pane.

Below are the outer and inner pane absorptance values for a 6 mm COOLITE SKN 165 II outer, 16 mm Argon (90%) filled cavity, and a 6 mm inner pane, clear and fritted. Replacing the clear inner pane of a unit with a fully fritted pane in order to create a spandrel, will increase the absorptance of the outer pane for reflective colours (whites and greys) and decrease it by a fraction for black.

Table 1 - Absorbance for SGG EMALIT Spandrel Panes

Inner Pane	Absorptance (%)	
	Outer Pane	Inner Pane
PLANICLEAR	33.6	1.3
White EMALIT	37.5	10.8
Grey EMAILT	34.8	28.1
Black EMAILT	33.4	33.4

In addition to the solar energy, the presence of the insulation prevents heat from being readily transferred from the internal surface of the glazing. Basic calculations comparing a standard vision unit of the construction; 6 mm COOLITE SKN 165 ii outer, 16 mm Argon (90%) filled cavity, and a 6 mm inner pane, again with and without frit and insulation, shows the temperature build-up that can occur. The following data is indicative of performance, and assumes 750 W/m^2 of incident solar flux.

Table 2 - Temperature for Clear and Insulated Spandrel Panes

Inner Pane	Temperature (ºC)	
	Outer Pane	Inner Pane
6 mm PLANICLEAR	21.2	25.1
6 mm Graphite Frit	23.8	47.9
6 mm Graphite Frit & 150 mm Foam Insulation	40.4	137.1

SHADOW BOXES

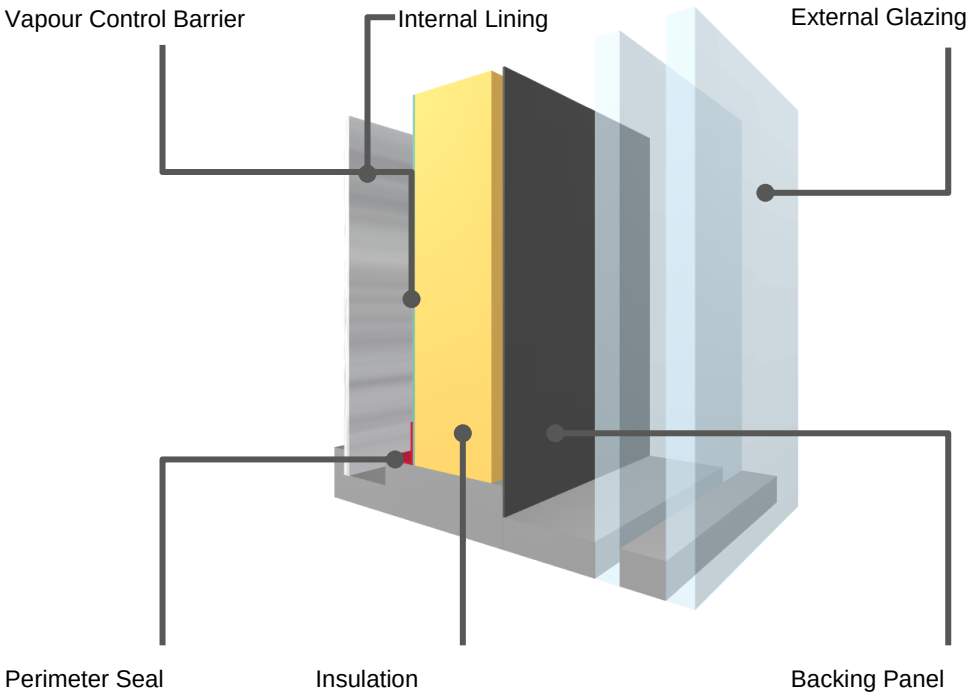

Figure 2 – Shadow Box Configuration

Although the lack of an opaque pane within a shadow box will reduce the amount of solar energy absorbed, in comparison to spandrel units, the air cavity between the inner surface of the glazing, and the insulation will trap warm air, resulting in a heat build-up against the interior of the unit.

THERMAL SAFETY

For both spandrel panels and shadow boxes, the temperatures generated within the glass can be significant, and as such heat treated glass, whether heat strengthened or thermally toughened, would be recommended for these applications, where thermal safety is a consideration.