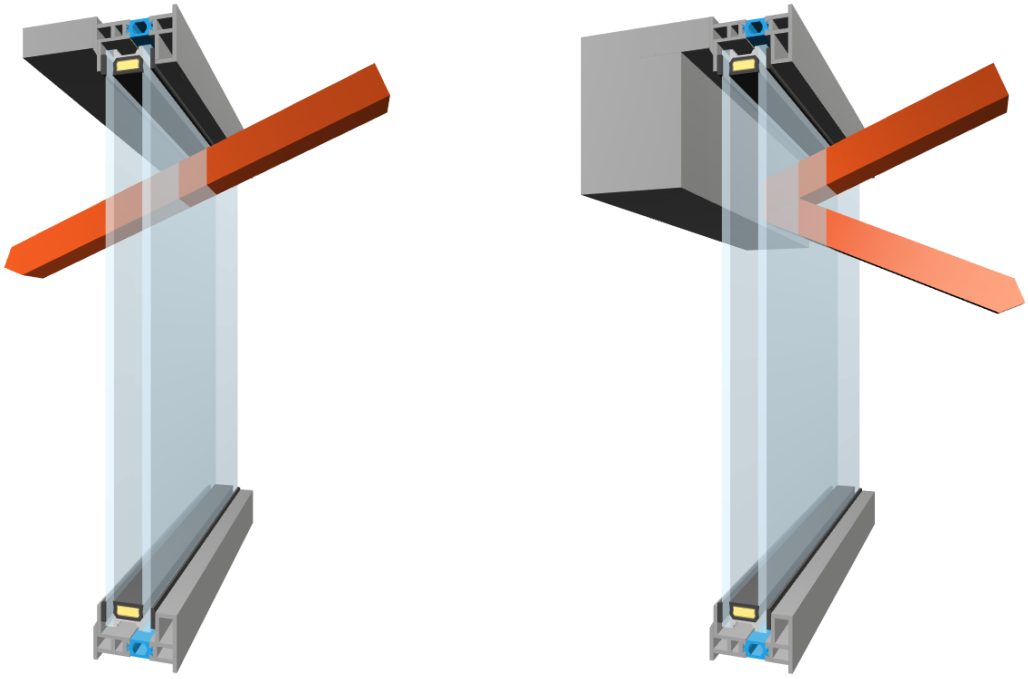
Any solid elements situated behind the glazing are considered as backups where thermal safety is a consideration, and can take the form of columns, dropped ceilings, dwarf walls or bulkheads. These elements can trap heat as well as reflect solar energy back on the glazing from the interior.



No Backup Bulkhead

Figure 1 - Illustration of Backup Reflectance

REFLECTED SOLAR ENERGY

Potentially, a portion of any solar energy passing through the glazing and incident on any backups can be reflected back onto the glazing. The amount of solar energy reflected will be dependent on the colour of the backup, with lighter materials reflecting more and darker materials less.

HEAT BUILD-UP BEHIND THE GLAZING

As well as reflecting solar energy back into the glazing, warm air can be trapped between backups and glazing, causing additional heat build-up in the glass. Where gaps are present above or around the sides of a backup, warm air can rise out from the cavity, and

the influence on the glass is more limited. For backups at the top of glazing, or that are completely sealed off, warm air can become trapped against the glazing and has a greater potential to create a significant temperature rise.

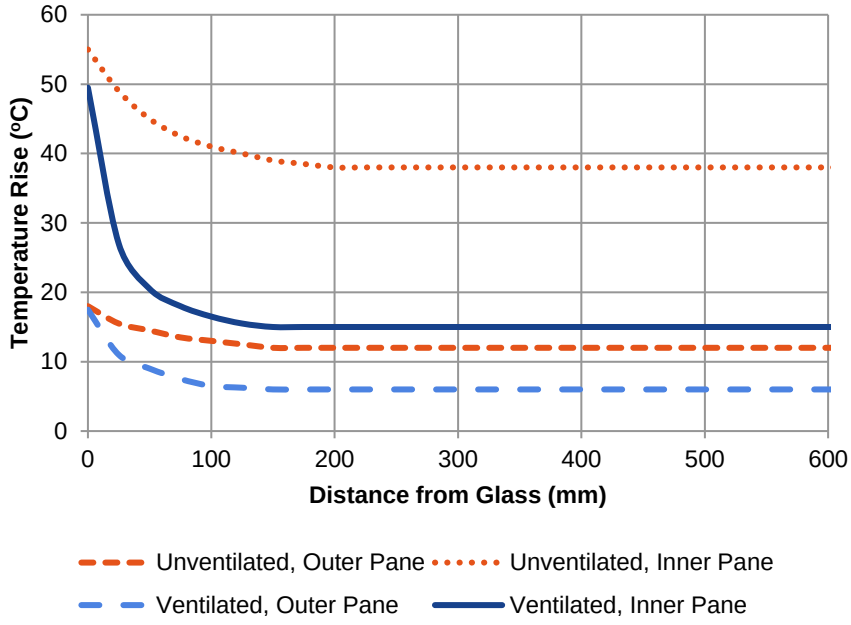


Figure 2 - Influence of Backup Based on Distance

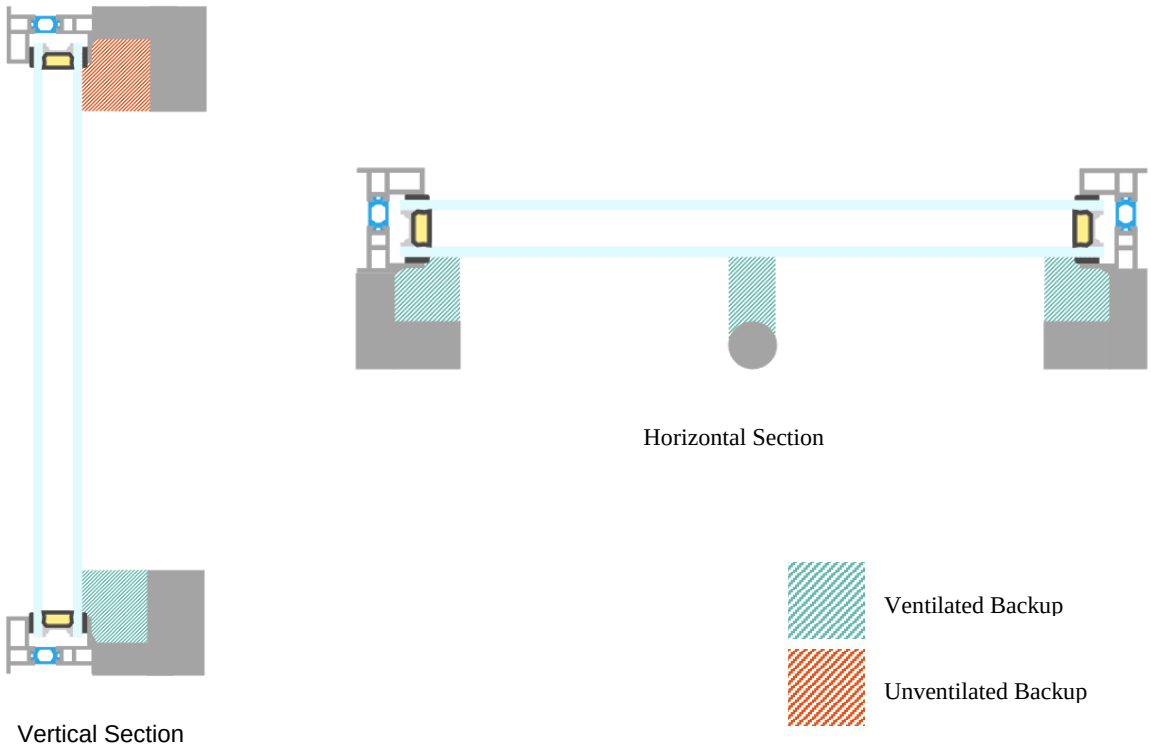


Figure 3 - Backup Ventilation

INFLUENCE ON CALCULATED TEMPERATURE DIFFERENCES

The influence of backups on the calculated temperature differences is simplified based on colour and whether it is considered ventilated or unventilated, and is defined by a temperature increase to modify the calculated temperature differences (ΔT_c), as below;

Outer Pane: $$\Delta T_{c;1} = \left[\Delta T_{b;1} + T_{bl;1} + T_{bu;1}\right] \cdot F_S \cdot F_F$$

Inner Pane: $$\Delta T_{c;2} = \left[\Delta T_{c;1} + T_{bl;1} + T_{bu;1} + C_F \cdot (T_i - T_e)\right] \cdot F_S \cdot F_F$$

When both backups and blinds are present, they will be considered to be mutually exclusive, as where they overlap, one will exclude the other. As such, the worst case situation is taken when assessing thermal safety.