

INSULATED GLASS UNITS – GLASS SELECTION

1. Glass for insulated glass units should be selected to the following standards:
 - NZS 4223:Part 3:1999 Glazing in Buildings – Human Impact Safety Requirements
 - NZS 4223:Part 4:2000 Glazing in Buildings – Dead, Wind and Snow Loadings
 - AS/NZS 4666:2000 Insulating Glass Units
 - NZS 4218:2004 Small Building Envelope if units are for housing, or buildings with floor area of 300m² or less

2. The factors to consider during selection are:
 - Appearance of glass – clear, tinted and/or reflective, visible light transmittance and reflectance levels.
 - Thermal insulation - the centre-of-glass U_{cog} value. This value is a measure of heat gain or loss through glazing due to environmental differences between the outdoor and indoor air. The lower the value the better the insulation. The R_{cog} value is the reciprocal of the U_{cog} value ($R=1/U$), so the higher the R-value the better the thermal insulation. U_{cog} and R_{cog} values do not take into account the effect of the frames and size of the glass.
 - Location of glazing if units are for housing, or buildings with floor area of 300m² or less. NZS 4218 divides New Zealand into 3 zones (refer Figure 1) - insulation requirements are different for each zone.
 - i. Refer Building Code Compliance Document Clause H1 Energy Efficiency
 - ii. Refer NZS 4218:2004 Small Building Envelope – this provides a schedule, calculation and modelling method for determining insulation.
 - iii. Refer document on Insulating Glass Units – Housing for guidance.

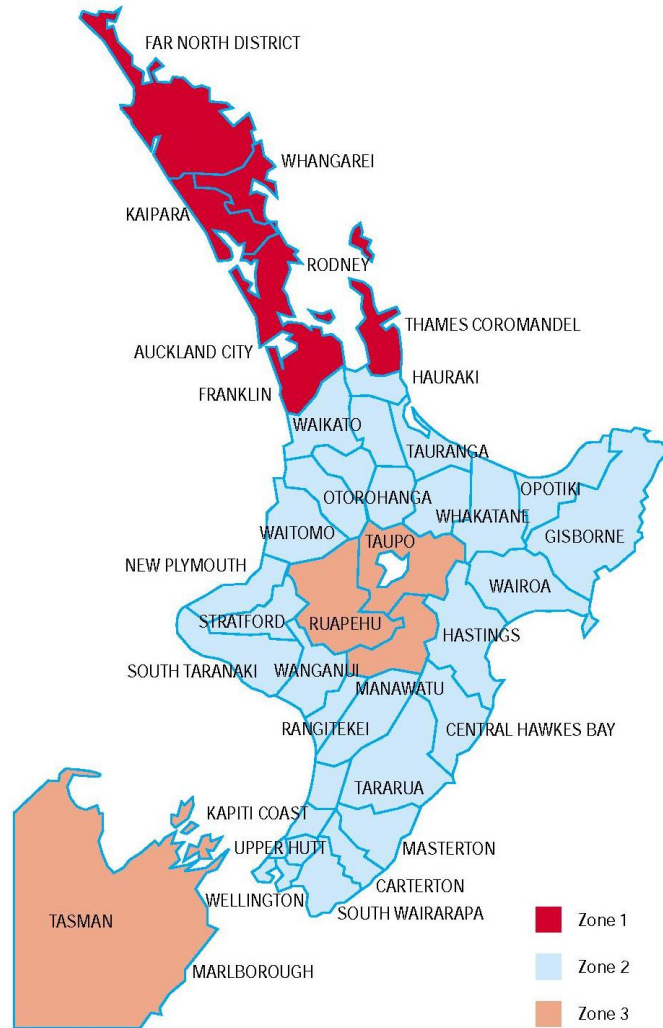


Figure 1 – Climate zones

- Solar insulation - the shading coefficient or SC required. This is the ratio of solar heat gain through the glass relative to that through 3mm clear glass at normal incidence. The lower the SC the better the solar insulation.
- Strength and deflection – these are dependent on limit state design wind pressures.
 - i. Ultimate limit state (ULS) design wind pressure is used to determine the thickness and type of glass. Refer wind charts in NZS 4223:Part 4.

- ii. Serviceability limit state (SLS) design wind pressure is used to calculate glass deflection. In most cases SLS pressures are 65% of the ULS pressures. Deflection should be restricted to 1.5 times the airspace thickness, or 18mm maximum, otherwise it can become visually disturbing.
- Human impact safety
 - i. Insulating glass units for low level glazing, doors, side panels, shopfronts, internal partitions and overhead glazing are required to meet the requirements of NZS 4223:Part 3:1999.
 - ii. The maximum permitted area of sealed insulating glass units is 1.5 times the area permitted for a single pane of thickness which is equal to the thinner of the two panes of the sealed unit.
 - iii. When an insulating unit is installed in a location where there is pedestrian access to both sides of the unit, then both panes of the unit shall meet the requirements of NZS 4223:Part 3. In situations where pedestrian access is restricted to one side of the unit, then only the accessible side need to conform.

Notes:

- Units glazed at high altitude require special care as often pressure equalization is required once in location or by using pressure valves or capillary tubes. The barometric pressure is 101.3 kPa at sea level, and this will drop by about 1 kPa per 100 metres increase in altitude.
- Unless a special request is made, polysulphide is used for the standard secondary seal.
- Structural silicone must be used for the secondary seal of units which are structurally glazed and butt jointed with silicone. The structural secondary silicone seal provides support for the outer pane of the unit. Silicones for glazing and secondary sealing must be compatible, such as Dow Corning 795, 995 and 982 silicones. For fast cure use DC 982. Polysulphide must not be used.
- Units with CIP laminated glass must be manufactured with a compatible secondary silicone seal such as Dow Corning 795, 995 or 982. Polysulphide must not be used as this can cause the CIP interlayer to delaminate.