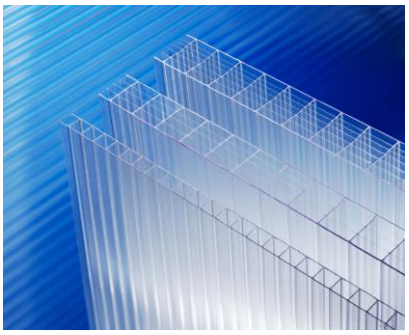
marlon st
LONGLIFE

Expansion allowance



EXAMPLE
A Marlon ST sheet is to be used to form a sign panel on the outside of a building. It is expected that the panel temperature will be as low as -12°C in winter and as high as 31°C in summer. The panel measures 1.2m wide and 3.0m high in a workshop at a temperature of 18°C. The panel is to sit on its bottom edge with a fixed point at the centre, so that thermal movement takes place from the bottom up and from the centre horizontally to each side. Estimate the clearance required in retaining channels which will frame the bottom and sides of the sheet.

1. Width
Dimension change in cooling from 18°C to -12°C
Temperature change = 30°C
Initial width = 1.2m
Expansion coefficient = 0.068mm/m°C
Reduction in width = 1.2 x 30 x 0.068 = 2.45mm
Dimension change in heating from 18°C to 31°C
Temperature change = 13°C
Initial width = 1.2m
Expansion coefficient = 0.068mm/m°C
Increase in width = 1.2 x 13 x 0.068 = 1.06mm
Total width change = ™w = 2.45 + 1.06 = 3.51mm, say 4mm when rounded up to the nearest mm.
As the sheet is fixed at its centre it will move half of this distance each side of the fixed point, ie. 2mm clearance is required in each side channel.

2. Length
Dimension change in cooling from 18°C to -12°C
Temperature change = 30°C
Initial length = 3.0m
Expansion coefficient = 0.068mm/m°C
Reduction in length = 3.0 x 30 x 0.068 = 6.12mm

Dimension change in heating from 18°C to 31°C
Temperature change = 13°C
Initial length = 3.0m
Expansion coefficient = 0.068mm/m°C
Increase in length = 3.0 x 13 x 0.068 = 2.652mm
Total length change = ™L = 6.12 + 2.652 = 8.862mm, say 9mm when rounded up to the nearest mm.

The edge engagement should be at least 15mm.
The rebate depth should then be 15 + 9 = 24mm to allow for the expansion and contraction of the sheet length.

Access Plastics Ltd., Unit 16 Ashbourne Industrial Estate, Ashbourne, Co Meath. Ireland. A84 W972.
Tel: + 353 1801 0022 Email: sales@accessplastics.com