

Outdoor use tips - Boto Plastics PVC board

The effects of outdoor exposure on tensile, color, impact resistance and dimensional stability are as follows:

- **Color consistency** - Based on the field experience of many users, it shows acceptable color maintenance using white sheet. Sheets with black and other colors are not recommended for long-term exterior usage. Colored sheets are produced with organic pigments. Exterior light and some interior light fixtures emit light waves in the lower range of the light spectrum. These low range light waves may cause a fading of the colors over time.
- **Impact Resistance & Environmental Stress Effect of temperature** – With decreasing temperature, there is a tendency towards decreased impact resistance. For exterior cold weather applications with minimal framing (i.e., post signs), it is recommended to use PVC sheet with 6mm gauge or thicker.
- **Effect of Chemicals** - Certain solvents (such as cyclohexanone) present in inks can cause environmental stress, cracking, and poor impact resistance. For this reason, the solvent systems used to dilute Screen Printing inks must be carefully chosen.
- **Thermal Expansion** - In the installation of Boto PVC sheet in outdoor applications with very drastic temperature changes, the linear thermal expansion of the material has to be taken into consideration. As in all plastic materials, the sheets can warp, bulge, or inadmissible stress conditions can occur. The linear thermal expansion of PVC sheet is about the same magnitude as that of solid plastic materials, and is clearly larger than those of metals, wood and inorganic building materials like brickwork and concrete. The dimensional change in each case depends on the expected difference between

minimum and maximum temperature and the length and width of the sheet to be mounted. As a reference, the below table shows a quick reference of thermal expansion & contraction rate during difference thickness of sheets.

Total Temp. Change (Δ)	Expansion / Contraction of Material at Standard Lengths / Widths (in inches)			
	48 in.	60 in.	96 in.	120 in.
20°F	0.036	0.044	0.071	0.089
40°F	0.071	0.089	0.142	0.178
60°F	0.107	0.133	0.213	0.266
80°F	0.142	0.178	0.284	0.355
100°F	0.178	0.222	0.355	0.444
120°F	0.213	0.266	0.426	0.533
140°F	0.249	0.311	0.497	0.622

Sheet Thickness	Distance Between Fastening Points
2 mm	6 - 8 in.
3 mm	12 -16 in.
4 mm	20 -28 in.
5 mm	31 - 43 in.
6 mm	47 - 70 in.

- **Painting** – The painting of Boto PVC sheet is easily accomplished with paints known to have compatibility with rigid PVC. When used for outdoor use, it is important that a light reflectance value of 55 or higher shall be used in order to avoid excessive heat absorption, which will result deforming or distortion. One side painting is always not recommended since the tension difference on each side may cause bending after a period of using outdoors. Vinyl and Acrylic Lacquers paintings are suggested to use on Boto PVC sheet as it brings a good adherence properties.