Polycarbonate versus acrylic domes

One question that we're often asked is what is our dome made of and what difference does it make to the amount of daylight that a light tube system will deliver? This data sheet explains the differences between the options and the implications for customers.

Contrary to information from certain manufacturers, there are no specific regulations for sun tubes installed in roofs constructed in wood. This means you can choose light tube systems with with domes made of either polycarbonate or acrylic. You may be told, by manufacturers who employ polycarbonate, that you need this sort of dome. Polycarbonate is required for large roof windows where the area of the glazing exceeds a certain ratio. In truth, you'd need to put around 20 domes on an average size roof to exceed this figure.

However, polycarbonate is not the best option for a dome as it is not stable when exposed to the UV rays present in daylight as it will turn yellow and cloudy. In fact, these domes can lose up to 10% of their transmittance in as little as 4 years. Compare this with the loss on the acrylic dome tested and the loss was only 1.2%.

This is why all Solarspot domes are manufactured from 'crystal clear' acrylic PMMA to maintain the maximum daylight transmittance possible. Just another factor that allows us to guarantee more light from our system versus any other daylight pipe.

A Solarspot installer compares our acrylic dome with a 4 year old Solatube dome.

Dome sample	Transmittance before aging %	Transmittance after 1000 hours artificial aging %	Transmittance after 2000 hours artificial aging %	Transmittance after 3000 hours artificial aging %	Transmittance after 4000 hours artificial aging %
Monodraught Acrylic Dome	87.6	87.4	87.2	87.1	86.6
Monodraught Polycarbonate Dome	86.6	85.5	83.5	81.8	79.6
Solatube Raybender Dome	83.5	80.6	78.2	77.1	75.1

Reprinted from BRE report - Aging of light pipe materials.

The table on the right is taken from an independent BRE (Building Research Establishment) test - Aging of light pipe materials.

The tests showed the Solatube Raybender 3000 dome lost an additional 10% of it's transmittance in only 4 years.

The equivalent loss in an acrylic dome would be around 1%.

Summary

This summary highlights the undesirability of polycarbonate as a dome material. Not only is it not as efficient as acrylic when new, it degrades when exposed to daylight 10 times faster than domes made from acrylic.

For maximum daylight transmittance, make sure you choose Solarspot Acrylic domes for your home.

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