VERY BOWED SPACER BARS

For those of you that avidly search the Trade Press for technical articles relating to our industry a recent article attracted my attention relating to the **co-efficient of linear expansion** for spacer bars used in the manufacture of sealed units.

The article advised that a spacer bar would increase in length by 20% and cited that a sealed unit 2000mm in length, the spacer bar would increase in length by 400mm during the summer months. Yes, 400mm really and causing problems with the unit. You bet it would!

Clearly change in temperature will affect all of the components used in the manufacture of a sealed unit. The German Warm Edge Working Party already have in place a protocol that tests the critical features of a warm edge spacer according to VE-17engl/1 within the test standard, all spacer bar manufacturers will have their own product tested and verified. Why not ask them for a copy.

The industry for many years have used aluminium spacer with robust success. Aluminium has a co efficient of linear expansion of 2.31 x 10^{-5} ^{0}K so it seems to make sense that any warm edge spacer with a similar expansion is going to function OK. The typical values are as follows:-

Glass 0.85 x 10^{-5} ^{0}K
Aluminium 2.31 x 10^{-5}K
Multitech Polymer 2.01 x10^{-5}K
Foil 1.83 x 10^{-5}K

Lets refer back to the article stating that a 2000mm long size of the unit will increase in length by 400mm (20%). Assume the unit is manufactured at an ambient temperature of 20^{o} and in summer with a south facing elevation the cavity temperature is 80^{o}C. This gives a ΔT temperature rise of 60^{o}C.

The following is a worked example of a spacer bar that will increase in length by 20%.

$$a = \frac{\Delta L}{(Lo \times \Delta T)}$$

a = co-efficient of linear expansion
ΔL = change in length
Lo = the original length
ΔT = change in temperature

$$a = \frac{400mm \text{ increase in length}}{(2000mm \times (80^{o}C - 20^{o}C)}$$

$$a = \frac{400}{2000 \times 60}$$

$$a = 0.003333$$

$$a = 333.33 \times 10^{-5}\ ^{o}K$$

The co-efficient of linear expansion for the theoretical spacer will be $333.33 \times 10^{-5}\ ^{o}K$ this is circa 16,000% higher than the typical industry average of $2.0 \times 10^{-5}\ ^{o}K$ for an approved warm edge spacer.

FACT OR FICTION

For Peace of Mind ask your spacer supplier to confirm and verify their approved value.

p.s. For comparison purposes Multitech would increase in length according to the same boundary conditions by 2.4 mm rather than 400mm as per the article.

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