



There are some that think aluminium framed windows will not be able to meet the thermal demands of the upcoming changes to document L of the building regulations. Whilst it is fair to say that the proposed changes do pose a challenge and not just for aluminium. But membership feedback at our recent spring forum confirms that our systems company members are already prepared, Phil Slinger writes



So why make windows out of aluminium when the material clearly has no thermal insulation characteristics of its own?

First of all, aluminium is highly durable and virtually 100% recyclable, not just once but many times over. Since its commercial availability in the 1880's, 75% of all aluminium produced is still in active service today.

Second, structurally, aluminium in 6060 or 6063 grade offers a high strength to weight ratio, allowing for slim frame profiles to be utilised whilst ensuring a high visible glass to frame ratio. This is achieved without additional structural components being added to the material.

Together with its recyclability credentials and its structural capabilities, a further consideration in its use in fenestration is the surface finish that it can carry. Anodised or powder coated, these finishes are some of the most sustainable that can be applied to any architectural product, often lasting the lifetime of the building itself. It is hardly surprising that other fenestration materials often have an external skin of aluminium in order to take advantage of these capabilities.

So, to thermal insulation, how is this achieved?

Clearly a thermal barrier is needed within the aluminium profile to introduce a thermally efficient frame design. This can be achieved in two ways, a 'pour and set' or a 'roll-in profile'. The majority of thermal breaks used today are profiles of polyamide, a glass reinforced nylon. These offer excellent structural rigidity combined with thermal efficiency. There are also various polyurethane 'pour and set' systems in use as well; these also offer excellent thermal characteristics.

Some of the highest frame U values that can be achieved have been tested and recorded by the independent Passivhaus Institute. Aluminium systems are shown on its website as achieving frame U values as low as 0.7M²k using polyamide thermal breaks, clearly demonstrating that

aluminium profiles can achieve excellent thermal insulation characteristics. Whilst these systems seem extreme for this year's changes to document L, they do demonstrate what is achievable as we move towards 'zero carbon' homes. Simply put, current aluminium framed systems for use in commercial and residential applications will continue to evolve to meet pending legislation.

Whilst frame insulation is a critical factor in the compliance stakes, cold bridging around the frame also plays a big part in enabling the installed window to achieve its claimed U value. In fact the London Energy Transformation Initiative (LETI) states that much of the thermal benefit of fitting a new replacement window can be lost by not considering the likely cold bridging where the window meets the reveal.

It is clear to see that members of CAB are working towards the uplift of thermal insulation values for all systems to meet or exceed the requirements of document L being implemented this year. Installer members are also reviewing their installation methodologies to include improved thermal efficiencies around the reveal by introducing new materials and techniques. As an association CAB will continue to support and communicate new methodologies to ensure aluminium remains at the forefront of thermal efficiency in the fenestration market. □

CAB staff are always on hand during normal working hours to answer any membership, training or technical aluminium fenestration related questions. News and event information is regularly updated on the CAB website at www.c-a-b.org.uk and also in the monthly ezine *A Window Into Aluminium*, which is free to sign up to. For membership enquiries please contact Jessica Dean by email: jessica.dean@c-a-b.org.uk or telephone 01453 828851.