



## **SYNTHESIA S-303 THE MOST SUPERIOR WAY TO SEAL A BUILDING ENVELOPE**

Dan Bowden and his team of construction specialists at Lite Homes LTD were tasked to build two timber framed properties at Longdown in Devon. Whilst they wanted to maintain their high standards and produce even more quality properties to add to their portfolio, they also wanted to improve on past airtightness test results that they had been getting. Dan knew that by installing Synthesia S-303 his airtightness and insulation requirements would be met. But why would you want to improve airtightness?

### **Airtightness and its importance in a building.**

The general consensus is that achieving a reasonable level of airtightness is important for the energy efficiency of dwellings and the comfort of occupants. The benefits of improved insulation levels and more energy-efficient heating systems are lost if warm air can escape from a building and cold air can leak in - leaking energy is leaking money!

The Air Tightness Testing and Measurement Association (ATTMA) defines 'air leakage' as the '...uncontrolled flow of air through gaps and cracks in the fabric of a building. It is sometimes known as infiltration or draughts. Air leakage is not to be confused with ventilation, which is controlled airflow in and out of a building'.

Building regulations also state that it '...is the uncontrolled exchange of air between inside a building and outside through cracks, porosity and other unintentional openings in a building, caused by pressure difference effects of the wind and/or stack effect.'

Wherever infiltration occurs, there is a corresponding exfiltration somewhere else in the building. During the summer, infiltration can bring humid, outdoor air into buildings. In winter, exfiltration can result in moist indoor air moving into cold wall cavities and can result in condensation and ultimately mould or rot. A significant amount of air leakage resulting in heat loss occurs in all buildings, but much less in air-tight buildings.



## The benefits of air-tight buildings include:

- Lower running costs through reduced heat loss.
- Fewer defects.
- Reduced condensation.
- Improved comfort.
- Reduced carbon emissions.

## Insulation and Airtightness

Traditional insulating materials have been used for their thermal capabilities but are notoriously bad at assisting with the airtightness of a building! This is because they are either porous, such as fibreglass allowing air to freely move through it, or they rely on perfect fitment such as PIR boarding. This fitment is often rushed or carried out by persons unaware of the importance of airtightness and often gaps and cracks are left and not sealed correctly, resulting in excessive energy loss!



## An Easy Solution for a Multitude of Conundrums

### Synthesia S-303 spray foam insulation offered three key factors - making it the perfect solution!

1. Firstly, its closed-cell content is greater than 90%, making it excellent at achieving an airtight blanket throughout the property. The installation method ensures that you get a fully sealed airtight blanket every time!
2. It has a water absorption rate of 0.20 kg/m<sup>2</sup> making it a superb water defence, stopping moisture ingress into the property.
3. It also has a compressive strength of 223.56 KPA! This adds additional structural strength to the construction.



### Here are some of the key benefits of Synthesia S-303 and the reason Dan chose to use it:

- The r-value of 0.22 w/m<sup>2</sup>K meant that its insulation abilities were unrivaled by any traditional materials such as fiberglass or PIR boarding!
- The speed of install, meant it took a quarter of the time it would have taken if a more traditional insulation was used.
- It will improve the home's air quality and create an even temperature throughout the property.
- It aids in enhancing the value of the property by reducing the EPC rating.
- It drastically reduces noise intrusion like no other standard insulation on the market.
- It comes with a 25 year warranty to protect your financial investment.



## The Results

### Airtightness Results

The minimum specified airtightness target is 10 m<sup>3</sup>/h.m<sup>2</sup> as specified by building regulations. Dan and the Lite Homes team were issued a target of 5.00m<sup>3</sup>/h.m<sup>2</sup> @ 50pa or less by the local building control department! The Synthesia S-303 performed brilliantly and with some other standardised methods achieved the following results:

- Measured air permeability plot 1 – 1.51m<sup>3</sup>/h.m<sup>2</sup> @ 50pa – Pass
- Measured air permeability plot 2 – 1.57m<sup>3</sup>/h.m<sup>2</sup> @ 50pa – Pass

### Acoustic Results

The team were also required to carry out some acoustic tests. Approved Document E states that the individual values of airborne sound insulation (D<sub>nt,w</sub> + C<sub>tr</sub>) should not be less than 45db for walls and floors in new properties. This was not a problem as all areas that used Synthesia S-303 had a test result of 50db (D<sub>nt,w</sub> + C<sub>tr</sub>), easily passing the test!

## Dan Bowden of Lite Homes commented:

“It is pleasing to be able to offer our customers a highly advanced product that not only is one of the best insulating materials available on the UK market, but also superb at obtaining airtightness throughout a property! This made my job much easier at the design and construction stage, as I knew several areas of concern would be rectified by utilising the Synthesia S-303 Closed Cell Spray Foam Insulation.

I was also delighted with the acoustic test results as it was another conundrum that I didn't have to think about. In addition to this, with the multitude of other benefits it produces, it really is a wonder why anybody would want to use anything else in this day and age? I think that people often see spray foam insulation as a gimmick but it really isn't! Synthesia products have BBA certification and strict application guidelines to ensure that it complies with building regulations and delivers maximum satisfaction on every application.”

**Install completed by one of our accredited teams, Foamtek based in Honiton, Exeter. October 2019**

**Case Study by: [swisdistribution.com](http://swisdistribution.com)**

