






Fire Resistance

The Beattie Passive Design

-  Fire safety at the heart of Beattie Passive Design
-  Fire resistant materials
-  147 minutes protection to one side of a party wall

Fire safety has been at the heart of Beattie Passive's design from the start. When initially designing the method of construction fire safety for occupants, fire fighters and the impact on the building fabric was heavily researched to understand the potential outcome of a fire within a Beattie Passive new building or retrofit.

With any timber frame building a main cause of concern is the inherent risk of combustion of the timber, structural components and insulations. Detailed research was carried out to look at the most effective way to reduce fire spread within and outside the fabric of the building.

Beattie Passive New Build and Retrofit System

- Importantly, Beattie Passive only use **Magnesium Oxide Class A1 Racking Boards (fire boards)** to the inside and outside of **every building**. These boards have a very high resistance to fire spread.
- **Internally:** 15mm plasterboard is separated from the fire board by a 25mm service void. This provides air space between the layers and increases heat transfer time.
- **Externally:** There is a 25mm ventilation void between the external fire board and the external render/brick façade/cladding.
- The injected EPS Eco-bead insulation greatly reduces air supply within the void reducing flame spread.
- For new builds the Beattie Passive structural floor forms the ceilings and are not integrated in to the wall design having a 50mm solid timber ring beam which is outside the wall structure. This is specifically designed to stop fire speeding from the ceiling to walls
- All window and door reveals are protected with **Class A1 fire board** and plasterboard to stop the spread of fire around windows and doors and travelling into the structure and exterior cladding
- Fire stops are designed at all party wall and roof / floor junctions to stop the spread of fire from one property to another. Within flats there are **fire stops between horizontal and vertical party walls**



- Within the Retrofit system the **Mechanical Ventilation with Heat Recovery (MVHR) ducting is fitted with fire stops** and intermittent covers at all MVHR penetrations

Fire Testing

Beattie Passive has designed the system to resist a fire, giving occupants additional time to escape, and protect other adjacent buildings. Consultation was undertaken with the London Fire Brigade to look at the effects for flashback and understanding the firefighting methodology within a Beattie Passive Building.

Testing on a Beattie Passive party wall section at **Warrington Fire Test Centre** resulted in one side of the party wall being **fire resistant for 147 minutes**. Thus, potentially giving an overall dwelling to dwelling of in excess of 3 hours fire protection.

Although testing under laboratory conditions is fine the most effective test is a natural fire caused by, one of the most powerful forces known to man, a **large lightning strike**.

In 2015, a Beattie Passive project was directly struck by lightning, receiving in **excess of 1 million volts**. The high levels of insulation and fire protection stopped the fire taking hold, causing no structural damage to the building or danger to occupants.



Station Manager, Callum Faint said: "The construction of this eco-built house helped us considerably at this incident and ultimately prevented the entire house being engulfed by a fire. There was a large volume of insulation in the walls and after the lightning bolt struck, heat got into the walls and the insulation has kept it all in there and prevented it from spreading through the house. We had to cut holes to let the heat out but there has been very minimal fire damage." We understand that nine other buildings were hit by lightning strikes that evening, and the Beattie Passive building was the only one that did not sustain major structural or fire damage.

If you would like further information on fire resistance or to discuss your project with us please contact us.