



SOLTHERM FSC
External Wall Insulation System
Innovative Fire Safe Technology



INTRODUCTION

The Soltherm FSC External Wall Insulation (EWI) system utilises a new advanced insulation, ensuring it is the safest and most economical solution of its type. As an ECO innovation classed system, it benefits from enhanced funding and increased property eligibility in social housing. This is part of a suite of innovative systems and products Soltherm are bringing to market this year to improve the safety and performance of EWI across several applications and sectors.

There are two main insulations utilised in the United Kingdom (UK) External Wall Insulation (EWI) market, mineral wool and grey, graphite infused, expanded polystyrene (EPS). Both insulations have their specific pros and cons, see Figure 1.

Grey EPS has many pros, with its main cons being associated to its fire performance. All applicators prefer using Grey EPS due to its superior workability, mainly related to its ability to be easily cut and formed around

intricate detailing. Mineral wool, on the other hand, has superior fire performance, achieving a non-combustible classification. This classification makes mineral wool the go to insulation for EWI high-rise projects in the UK.

With the benefits of Grey EPS considered, it is easy to see why it was the preferred option for low rise. It is workable, cost effective and provides great thermal efficiency whilst remaining compliant with Building Regulations. After the Grenfell disaster, mineral wool began replacing Grey EPS as the insulation of choice on low rise projects. Though providing an improved fire performance, the project cost and insulation thicknesses increased as well as the program of works due to the enhanced specification and installation requirement of mineral wool EWI systems. Advantages of Grey EPS considered, Soltherm instigated an innovation program to explore the possibilities of improving the fire performance of Grey EPS EWI systems. This resulted in the development of a patented Fire Safe Composite (FSC) insulation panel, unique to the industry.

FIGURE 1.

Criteria	Mineral Wool	Grey EPS
Fire Performance	A1	E
Suitability for High Rise	***	*
Lightweight	*	***
Water Resistance	**	***
Workability	**	***
Thermal Performance	**	***
Impact Resistance	**	***
Render Adhesion	*	***
Recyclability	**	***
Cost	*	***

*** Excellent
 ** Good
 * Poor

HOW DOES GREY EPS PERFORM IN FIRE?

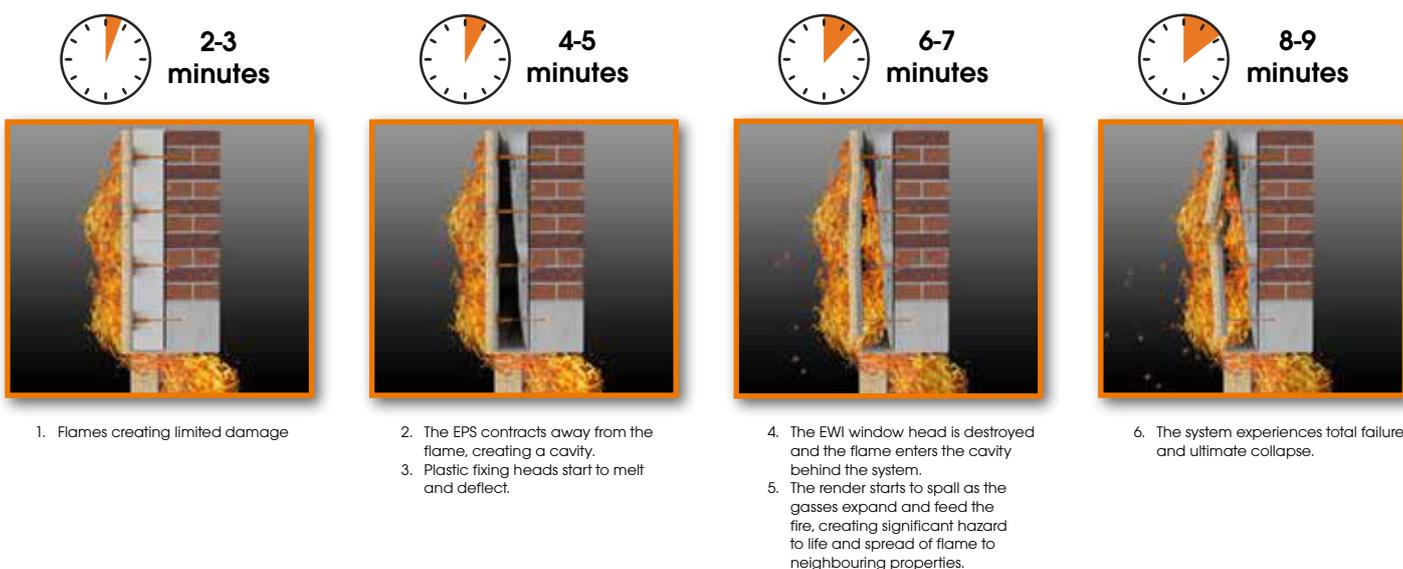
Most Grey EPS external wall insulation systems will achieve a B fire rating in accordance with BS EN 13501-1 Fire classification of construction products and building elements. This means they are fully compliant with UK Building Regulations when used in low rise applications and not within 1m boundaries.

So why the apprehension to specify Grey EPS?

Grey EPS, by its own nature, facilitates the spread of flame within the system. The insulation contracts away from the flame creating cavities behind the render. Conventional Grey EPS EWI systems currently manage this risk with the

integration of mineral wool fire barriers and stainless-steel fire fixings, as per the recommendations of BR135 fire performance of external thermal insulation for walls of multi-storey buildings. Fire barriers are installed at every floor slab above the first storey as well as fire fixings at a rate of 1 per meter squared. These measures assist in slowing the spread of flame and render collapse respectively but do nothing to prevent the formation of cavities. These cavities provide a gateway for flames to move freely behind the system, seeking oxygen and spreading rapidly.

FIGURE 2.



In addition, when Grey EPS melts the liquid matter can fuel the flame. This liquid EPS will also form on the surface, absorbing into, the fire barriers. These fire barriers then act like fire lighters in a BBQ, continuing to burn the liquid EPS and produce black toxic smoke. At such temperatures, hot flammable gases are created, which ignite instantaneously, resulting in damage to the system in the form of spalling render and system collapse. This scenario is hazardous for people escaping the building or those individuals fighting the fire.

HOW DOES SOLTHERM FSC-EWI WORK?

The Soltherm FSC-EWI system utilises a patented composite Grey EPS insulation board. Exceptional fire performance is achieved due to three unique features that dramatically reduce fire spread through the EWI system.



1. A1 fire rated compartmentalisation - The FSC has built-in A1 fire barriers that generate fire safe partitions within the insulation panel. These barriers prevent direct fire exposure inside the system and restrict the melted polystyrene foam from running down to the fire source and fuelling the fire.



2. Innovative window & door head fire barriers - The FSC-EWI system requires that a specially modified mineral wool fire barrier is installed above all window and door heads. This pioneering fire barrier has been developed to prevent the absorption of melted polystyrene foam.



3. Mechanically & wet fixed - Composite panels are both mechanically and adhesively fixed. The insulation is glued to the substrate with A1 rated Soltherm adhesive. This adhesive prevents the movement of fire and toxic gasses behind the system.

A PROVEN SOLUTION

The Soltherm FSC-EWI system has demonstrated that it far outperforms that of standard Grey EPS and behaves more like mineral wool. This has been proven through full scale fire testing in accordance with BS 8414-1 Fire performance of external cladding systems. This testing method is widely known as the most real to life and extreme method of fire performance evaluation.

Notably, the system exhibited similar properties to that of a mineral wool system, passing the 60-minute test with flying colours. The innovation demonstrated a high resistance to the spread of flame with no collapse, concluding that the system is a justified alternative to mineral wool.

Even with the above considered, Soltherm do not recommend the system be used in the following scenarios to ensure compliance to Building Regulations;

- On high rise buildings
- Within one-meter boundaries



SUMMARY

- ▶ A tested and proven solution – full scale fire tested in accordance with BS 8414-1
- ▶ Fire safety that is comparable to mineral wool systems
- ▶ Cost effective in comparison to mineral wool EWI systems
- ▶ Maintains essential advantages associated with Grey EPS systems i.e.
 - Impact resistance
 - Low water absorption
 - Easy installation
 - Render adhesion strength
 - Thermal properties
- ▶ An excellent fire safe solution for low rise applications
- ▶ Increased fire evacuation times compared to standard Grey EPS EWI systems.

The FSC panel, through extensive testing, demonstrates a significantly improved fire performance to that of conventional EPS. This innovative solution from Soltherm provides an economic & fire safe alternative to mineral wool.

Please contact Soltherm to arrange a CPD.
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