EPS TECHNICAL BRIEFING

For Construction, Civil Engineering and Architectural professionals

High Performance and Reliability

Expanded Polystyrene (EPS) is proven in use over decades across the globe for construction, insulation and civil engineering applications. It has many advantages including light-weight, strength, durability, low environmental impacts and brings exceptional cost-effectiveness.

HOW DOES EPS PERFORM?

EPS has been in use for more than 50 years and has had BBA Approval since 1976. EPS has long been the architect's number one choice for economy, performance and sustainability in a wide range of applications including:

- Roof, floor and wall insulation
- Sub-structures and void-fill blocks for civil engineering
- Foundation systems
- Clay Heave protection
- Supporting bridge, rail and road widening schemes
- Heating system support
- Interior and exterior decorative mouldings

High Strength and Structural Stability

In spite of its light weight, the unique matrix structure brings exceptional impact strength and block-rigidity. It is ideal for use in construction and civil engineering, particularly as a structural base infill in road, railway and bridge infrastructures. Independent strength testing in Northern Europe of such applications showed that after 3 decades EPS was just as strong as the day it was first laid. EPS stability does not deteriorate with age - it is the closest of any modern building material to fulfilling the 60-year life set as a performance target by the UK Building Regulations.

Independent Report Proves Long-Term Strength

A European independent report from the Norwegian Public Roads Administration, entitled 'Long-term performance and durability of EPS as a lightweight fill', based on periodic site inspections and tests on EPS embankments and highway foundations confirms the durability of EPS in extremely demanding applications.

EPS was first placed in the ground almost 30 years ago and it is just as strong today – the tested strength routinely exceeding the original minimum design strength of 100kPa. EPS bridge foundations, subject to many years of sustained loading, show 'creep' deformation of less than 1.3% - only half as much as had been theoretically predicted.

Resistance to Water Ingress

After 30 years in the ground, samples of EPS retrieved from locations as little as 200mm above the groundwater level all have less than 1% water content by volume, whilst blocks which are periodically entirely submerged show less than 4% water content – performance notably superior to most other foamed plastic materials.

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EPS
ECONOMY PERFORMANCE SUSTAINABILITY

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Insulation

EPS has a long established reputation for its exceptionally high insulation qualities. Its BRE 'A Plus' rating makes it the perfect choice for under-floor, between-floor, walling and roofing applications giving a constant insulation value across the full service life of the building.

For those requiring high-performance EPS capable of meeting the Code for Sustainable Homes, there are low lambda specifications widely available. With EPS thickness as low as 70mm, it is therefore possible to achieve total floor thickness of 135mm within the performance criteria of CSH.

Design Versatility

Ease of cutting or moulding allows the factory production or on-site preparation of complex shapes to match demanding architecture and design– usually without the need for specialist cutting tools or skills.

Accredited Performance

Tested to some of the world's most demanding performance standards, EPS has BBA Approval, as well as BRE Certification and many wider industry accreditations which testify to its light weight, high compressive and impact strength, insulation, safety and eco-credentials. Fire retardant EPS is available and generally meets the requirements of Class E when tested in accordance with BS EN ISO 13501-1 (2002). EPS will self-extinguish on removal of the flame source.

Safe and Secure

EPS is non-toxic, chemically inert, non-irritant and rot-proof. Fungi and bacteria cannot grow on EPS and it is insoluble and non-hygroscopic. It is also rodent-proof and offers no nutrient attraction to vermin. Nor is it affected by water thus ensuring that moisture contact will not lead to deterioration of the product or its performance. All of this makes it entirely safe across all construction applications including subterranean and marine environments.

EPS boasts **ECO points** projected over a 60-year life of only 0.043 - a clear assurance of the eco-credentials of EPS making it the best choice for sustainable building projects.

EPS enables full compliance with **Building Regulations Part L1 and L2**.

EPS is **non-hygroscopic, non-irritant and rot-proof**.

EPS provides a **constant insulation value** across the full life of a building. EPS is available in standard specifications ranging from 0.038Wm²K to 0.030 Wm²K thermal conductivity.

EPS remains **dimensionally stable** unlike fibrous materials which will settle over time.

EPS manufactured by BPF members carries the CE mark.

EPS is widely used in a **fire-retardant** grade. Standard grade EPS should be installed in a protected/enclosed environment such as under concrete screed, behind plasterboard, in building cavities and underground.

EPS is well proven in decades of use in civil engineering applications where it has been **subjected to millions of loading cycles**.

EPS is a **high-performance, value-for-money** material. Well-invested and highly efficient manufacturing processes help manufacturers maintain competitive pricing policies compared with other less effective and higher installed-cost alternatives.

This is one of a series of Technical Briefings for building and architectural professionals. It accompanies our new Specifier Guide. Please visit our web site for copies of all these publications.

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