

ELASTOMERIC COATINGS

WITH EXPANDABLE MICROSPHERES

Make coatings with higher solar reflectance and lower thermal conductivity



OVERVIEW

Product Type

Expanded microspheres

Main Benefits

Good thermal insulation
Good filling capacity
High spreading rate
High solar reflectance
Improved stability

Applications

Paints
Roof coatings
Wall coatings

Expandable Microspheres

Expandable microspheres are used to add **functionality** and **quality** to paints and coatings, and **reduce cost**. These **resilient ultra-light** thermoplastics spheres are widely used in elastic waterproof **wall** and **roof coatings**. They **keep** their **shape** and **volume** during mixing and application, by brush or roller with **less splatter**, or by **spray** application. Expandable microspheres are compatible with many different resin types, and available in grades **suitable** for both **solvent-based** and **water-based** coatings.

Expandable microspheres have low binder demand which means **less binder** can be used, without comprising the quality of the coating, **reducing weight** and **reducing** formulation **costs**. In warm climates air conditioning accounts for up to two thirds of energy consumption in residential areas. Exterior coatings formulated with expandable microspheres will have **higher solar reflectance**, lower thermal and reduced surface temperature. This will help **reduce** indoor **temperature** and the requirement for air conditioning, reducing **energy** consumption.



PVC, Permeability & Flexibility

Pigment volume concentration (PVC) and volume solids can be significantly increased due to the low binder demand and good rheological properties of the microspheres. Compared to conventional fillers and pigments, expanded microspheres have a very low surface area per unit volume, with oil absorption normally between 35 to 45 g/100 cm³ (ASTM D 1483). This affects binder demand. When inorganic fillers are replaced with expanded microspheres the critical pigment volume concentration (cPVC) will be higher, coating quality will be improved and formulation costs reduced. With lower water/solvent content thicker layers can be applied, and drying time reduced.

Vapour permeability is improved, allowing the transportation of water vapour through the material, giving a breathable coating.

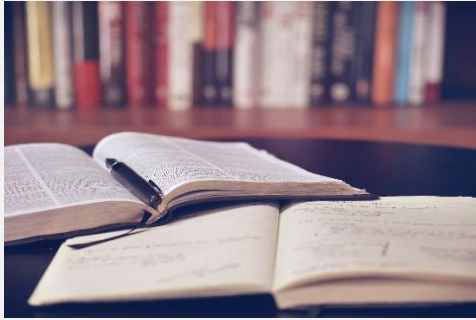
Expanded microspheres are elastic and resilient, remaining **flexible** at low temperatures. Elasticity is necessary to maintain the protective properties of elastomeric coatings, such as, crack bridging. Coatings should be able to move with the substrate, expanding in heat and contracting on cooling. The spheres adhere to the resin and their elasticity allows good film deformation, and is not compromised when PVC is increased. By comparison, coatings with a high level of inorganic filler normally lose some elasticity.

Energy Efficiency

Thermal conductivity and insulation



Inorganic fillers increase **thermal conductivity** of a coating. Expanded microspheres reduce it, improving **thermal insulation**, an important property which can be utilised in warm and cold climates. In **warm climates**, thermal insulation keeps heat out and reduces the need for air conditioning. In **cold climates**, interior paints keep the heat inside, reduce the need of heating and prevent water condensation on cold walls. Expanded microspheres improve durability of elastic coatings, helping to keep buildings cool in the sun. The spheres have excellent solar reflectance capacity for visible light, especially in the near infrared (NIR) region, beneficial in **reducing** surface heat load and **energy consumption**. Tests have shown heating, ventilation and air conditioning (**HVAC**) can be **reduced** by at least **40%**, with coatings reflecting the whole range of wavelengths; 3% ultraviolet (UV), 44% visible light (VIS) and 53% NIR. Replacing inorganic filler with expanded microspheres can **improve solar reflectance**, which is **maintained** after **dirt-pickup**, and improve hiding power, making the coating **appear whiter**. Dirt pickup resistance can be improved by making the surface of the coating more hydrophilic. **Coloured coatings** shown to have increased durability.



Further Reading

Our **Technical Guide – Expandable Microspheres** takes an in depth look at the properties of expandable microspheres. A great introduction if you are new to the world of expandable microspheres.

Expanded microspheres are also highly effective in paints and coatings. These are just a couple of examples which benefit from the use of the microspheres, but they are not the only possibilities. To discover more refer to our **Application Guide – Paints & Coatings with Expandable Microspheres**.

For guidance on the best way to handle and mix dry expanded microspheres take a look at our **Technical Guide – Handling Expandable Microspheres**.

What's Next?



Do you need help **choosing the right grade** for your application, **more information** or a **sample** to try?

We are always happy to help and answer any questions you may have. Please do not hesitate to contact us:

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Something to Note

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