

PAINTS & COATINGS

WITH EXPANDABLE MICROSPHERES

Make high quality paints and coatings, with increased functionality at lower cost



OVERVIEW

Product Type

Expanded microspheres

Main Benefits

High water permeability
Improved application
Increased product volume
Matting effect
Reduced cost
Spray application

Applications

Anti-condensation paints
Anti-slip coatings
Interior flat paint
Solar reflective coatings

Expandable Microspheres

Expanded ultra-lightweight **microspheres** have been successfully used as a lightweight filler in paint and coatings for decades. They can **add value** to many different types of paints and coatings by adding **functionality** and **quality**, and **reducing** formulation **costs**.

The microspheres offer **unique** properties, in comparison to other lightweight fillers. They are highly **elastic** and **resilient**, keeping their volume and spherical shape during **preparation** and **application** of paints and coatings, allowing them to be **spray applied**.

The thermoplastic polymer shell of the microspheres gives them an excellent **compatibility** with resins.

Expanded microspheres are available in different **particle sizes**, such as 40 μm and 80 μm , and with **densities** as low as **0.025 g/cm³**. Offered as dry powder or pre-wetted microspheres they provide solutions for **aqueous** and **non-aqueous** paints and coatings.



Preparation & Formulation

Expanded microspheres, unlike ceramic and glass microspheres, are highly **elastic** and can **withstand** hard **mechanical** treatment without damage. When preparing coatings there is no need for special dispersing equipment; dissolver, butterfly and planetary mixers are suitable. A small amount of anti-foaming agent can help minimise stabilisation of air bubbles. Any entrapped air can be removed by de-aeration in vacuum. As the spheres have a significantly **lower specific surface** than a similar volume of mineral fillers the demand for dispersing agents will be lower. All lightweight fillers have a tendency to float, it is recommended to evaluate suitable rheology modifiers.

Substituting other fillers, such as calcium carbonate, ceramic or glass microspheres, with expanded microspheres will **reduce binder** demand and **density**.

The lower binder demand and higher cPVC of expanded microspheres, giving a **lower PVC/cPVC** ratio, makes it possible to **increase filler** loading and **maintain** the same **PVC/cPVC** ratio.

Since pigment per % volume will be less pigment addition should be re-calculated to account for the lower coating density and maintain the same pigment volume addition,

With the spheres adding volume and decreasing density, a coating with a total volume solid content of at least 60% and a density of **0.7 to 0.8 g/cm³** is possible.

Unique Properties

Why are expanded microspheres used?



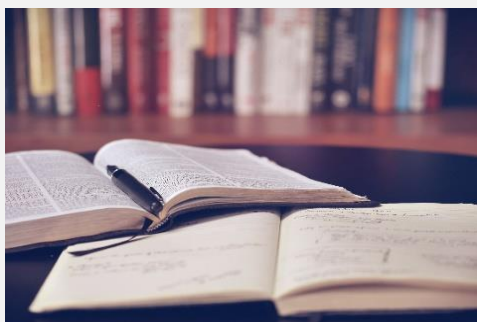
Cost savings can be made by using less binder due to lower binder demand, increased product volume and lower transport costs due to reduced weight, which also makes **handling easier**.

Coatings are **easy to apply** as the spherical spheres work like ball bearings, providing rheology properties that help **minimise sagging** and **splattering** during application, by brush, roller or spraying. Coatings have **good filling capacity** and a **higher spreading rate**, than conventional formulations. The spheres can be used to **modify** the **surface finish**, contributing to matting and creating soft touch effects. The degree of effect depends on the microsphere particle size used.

Low binder demand and rheological properties of the microspheres make it possible to **increase** pigment volume concentration (**PVC**) and volume solids. This means less water/solvents in the formulation is needed and **drying time is reduced**.

Coatings have **low water absorption** due to the microspheres being closed cells, having a positive influence on long-term **durability** of the coating, and substrate. **Vapour permeability** is improved.

While mineral fillers increase thermal conductivity, expanded microspheres reduce it, improving **thermal insulation** properties.



Further Reading

Our **Technical Guide – Properties of 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 cool roof and elastomeric coatings. These are just a couple of coating applications which can benefit from the use of the microspheres, but they are not the only possibilities. To discover more about using expandable microspheres in elastomeric coatings, refer to our **Application Guide – Elastomeric 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 of 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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