

ADHESIVES

WITH EXPANDABLE MICROSPHERES

Make adhesives lighter and more cost effective



OVERVIEW

Product Type

Expanded microspheres
Unexpanded microspheres

Main Benefits

Control flow
Increased production volumes
Reduced weight
Cost savings

Applications

1 or 2 component adhesives
De-bonding adhesives
Expandable adhesives
Hot melt adhesives
Solvent-based adhesives
Water-based adhesives

Expandable Microspheres

In adhesives, expandable microspheres can be used as a **lightweight filler** or as a **blowing agent**.

Expanded microspheres, with **densities** as **low** as **0.025 g/cm³**, are used as a lightweight filler in **1 or 2 component adhesives, hot melt adhesives, solvent-based adhesives** or **water-based adhesives**.

Unexpanded microspheres are used in **de-bonding adhesives** and **expandable adhesives** as a physical blowing agent.

Expandable microspheres make it possible to formulate adhesives with reduced **weight**, lower product **volume** cost and increased **flexibility**. The spheres can also be used to adjust **viscosity** of adhesives.

Elastic and resilient, expandable microspheres can be used in **spray applications**.



Application Ideas

And type of microsphere to use

Why Use Expandable Microspheres?

Adding **expandable microspheres** to an adhesive will reduce its density, increase its volume and decrease binder demand, giving a **lower volume price**.

When expanded, the microspheres are extremely lightweight. This means even a small addition, such as **0.1% w/w**, can **reduce** the **density** of an adhesive.

Unlike ceramic and glass microspheres, expandable microspheres are elastic and resilient, **improving flexibility**.

Binders are often the most expensive component of an adhesive formulation. By adding expandable microspheres it is possible to **reduce** the amount of **binder**. Compared to fillers such as calcium carbonate, the microspheres have a **low specific surface area** per volume. This means expandable microspheres have a **lower binder demand**.

The lower specific surface area of the microspheres makes it possible to **increase the volume** of an adhesive without increasing the binder demand.

Expandable microspheres can be used to **adapt viscosity**, and **reduce** its **flow capacity**. Replacing a heavy filler with the microspheres will reduce its viscosity. Adding more microspheres to regain volume will further **increase product volume** and **reduce cost**.



Expanded microspheres as a lightweight filler:

1 or 2-component adhesives e.g. *structural adhesives* at **≤5% w/w***

Hotmelt adhesives e.g. *bookbinding, electronics, packaging, woodworking* at **≤1% w/w***; the microspheres can withstand multiple heat cycles without collapsing during production and application

Solvent-based adhesives e.g. *graphics, labels, tapes* at **≤0.5% w/w***

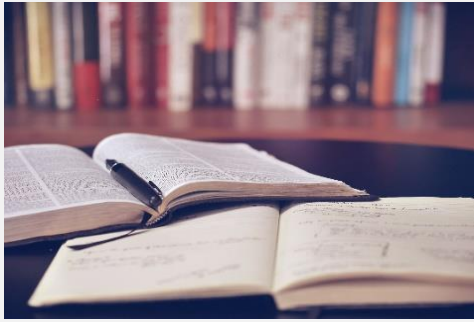
Water-based adhesives e.g. *automotive interiors, building and construction, labelling, sealing packaging* at **≤0.5% w/w***

Unexpanded microspheres as a blowing agent:

De-bonding adhesives e.g. *aerospace, automotive, electronics, telecommunications, recycling component parts at end of life* at **<10% w/w***; heat causes the microspheres to expand and the adhesive to lose its grip

Expandable adhesives e.g. *sealing functions, insulation materials* at **≤5% w/w***; utilising internal pressure created during expansion of the microspheres

*Suggested addition



Further Reading

Discover the unique properties of expandable microspheres and the benefits of using them in our **Technical Guide – Properties of Expandable Microspheres**.

Hybrid adhesives and sealants offer an innovative and versatile solution, the strength of an adhesive, together with the elasticity and flexibility of a sealant. Learn about using expandable microspheres in sealants in our **Application Guide – Sealants 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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