

# MODELLING BOARD

WITH EXPANDABLE MICROSPHERES

Make lightweight model making board with improved properties and less shrinkage



## OVERVIEW

### Product Type

Expanded microspheres

### Main Benefits

Cost savings  
Improved machining  
Reduced weight

### Applications

Artificial wood  
Decorative crown moulding  
Model making material  
Vehicle interior panels

## Expandable Microspheres

Dry expanded microspheres are used as a **lightweight filler** in a variety of **rigid epoxy, polyester, and polyurethane foams** because they have **smaller specification** profiles than chemical blowing agents (CBAs).

The microspheres **benefit** decorative crown moulding, model making material, and artificial wood in a variety of ways.

Compression set, drilling and sawing of artificial wood, and gasket sealing are all examples of **property enhancements**.

**Boud Minerals** produce **dry expanded microspheres** in the **United Kingdom** to bring down costs, make production more environmentally friendly and improve product availability. This gives our **customers** more freedom in the choice of densities and packaging.



# Properties

Advantages and improvements

## Expanded vs Glass

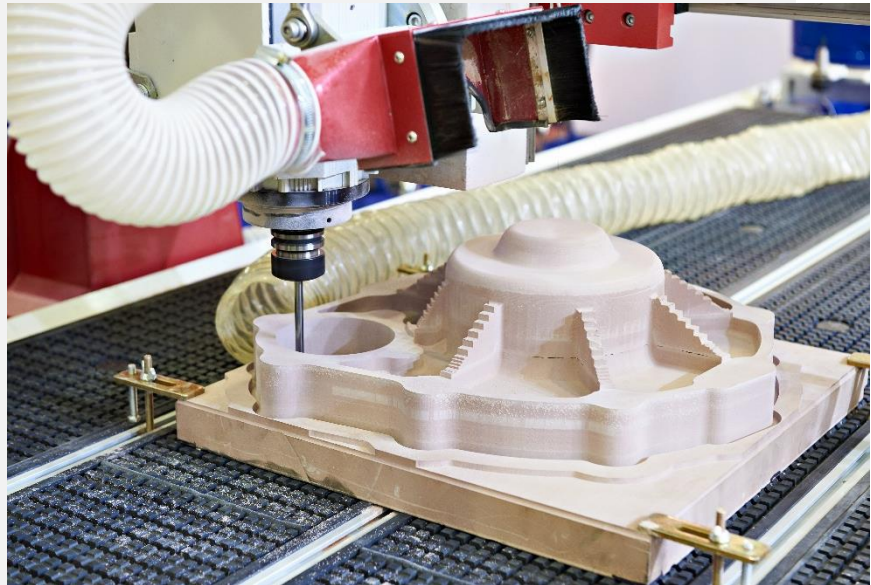
Using **1 to 3% w/w** of **dry expanded microspheres** with an average particle size of  $40\ \mu\text{m}$  and density of  $0.025\ \text{g/cm}^3$ , it is possible to reduce formulation density by up to 50%.

By comparison, at least **20% w/w** addition of **glass microspheres**, with a density of  $0.200\ \text{g/cm}^3$ , is needed to achieve a similar reduction in density.

**Mechanical forces** during processing can **fracture glass** microspheres. **Expanded microspheres** can be compressed **without breaking** and regain their original shape when unloaded.

Tests have shown **expanded microspheres** can withstand normal shear forces during mixing, being **unaffected** after mixing at **2000 rpm** for **20 minutes** with a dissolver disc. However, **high shear forces** can damage the microspheres in a **high viscosity** system. Should the spheres become damaged, using a grade with a **higher density** or **larger particle size** can overcome the problem.

In a **two component** polyurethane system **dry expanded microspheres** are generally added and **pre-mixed** into the polyol component. Alternatively, the spheres can also be **added** as a **separate** component in the mixer just before the injection into the mould, beside the polyol and isocyanate. This method is preferred since the microspheres can be pumped directly out of a silo.



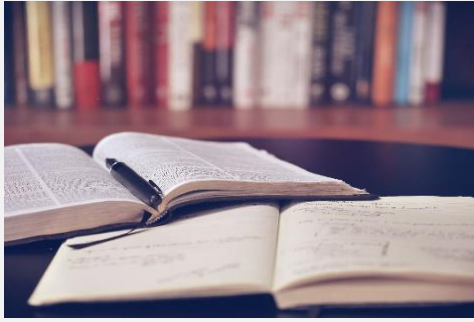
In addition to giving a considerable **weight reduction**, dry expanded microspheres form a **closed cell structure**, more **uniform** compared to conventional foams. The **excellent surface finish** of the modelling board can be lacquered immediately. There is usually no need to use crack fillers.

**Sound** and **vibration damping** as well as **thermal insulation** are improved.

Elasticity and internal pressure of the microspheres contributes to **less shrinkage** of the part during production, and can also **prevent stress cracking**.

**Dust** generated **post-treatment** of modelling board made with dry expanded microspheres is much **less irritating** for lungs and respiratory tracts **compared** to block material containing **glass microspheres**. Modelling board is also less abrasive, resulting in considerably **less wear** on **machine parts**.

The viscosity of a thermoset formulation will be affected by the addition of lightweight fillers. The low density of dry expanded microspheres means it is possible to achieve **lower formulation densities** **without** encountering issues with **high viscosity**.



## 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.

Should a crack filler be required to finish the surface of a modelling board, to find out about an easy to handle lightweight filler with good filling capacity in our **Application Guide – Crack Filler 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:

**t:** +44 (0)1406 351988

**e:** tracey@boud.com

**w:** www.boud.com

**a:** Boud Minerals Limited, West Bank, Sutton Bridge,  
Lincolnshire, PE12 9UR, United Kingdom

### Something to Note

The information contained in this guide is a result of our experience and research. It is given in good faith but under no circumstances does it constitute a guarantee on our part, nor does it hold us responsible, particularly in the case of legal action by a third party.