

FAIRING COMPOUNDS

WITH EXPANDABLE MICROSPHERES

Learn about a putty that is simple to make, fantastic to use and easy to sand



OVERVIEW

Product Type

Pre-wetted expanded microspheres

Main Benefits

Easy application
Extraordinary sanding properties
Price competitive

Applications

Boat repairs
Surfboard repairs
Surfboard shaping
Windsurf board repairs
Windsurfboard shaping

Make it Your Own

Creating your own fairing, filling or structural **putty** offers you a more **versatile** approach to **repairs**.

Using low density fillers in fairing compounds makes the cured resin much **easier** to **shape** and **sand**.

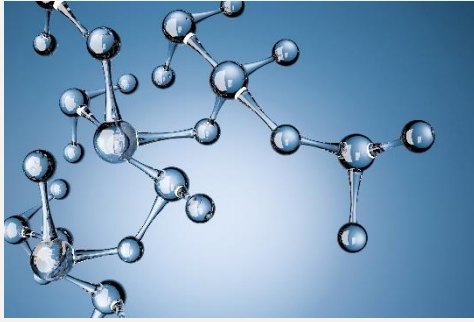
Microspheres **941** is a **dust-free**, **ultra-lightweight** and cost effective filler. It is blended into resin at additions of 5% to 10%, by weight, giving a **lightweight paste** that is **easy** to **spread** and **shape**.

When cured is **easy** to **sand**, allowing you to create a **smooth surface** without bumps or hollows.

Microspheres 941 can be used with epoxy or polyester resin to create a **light** and **workable** fairing compound.

Boud Minerals produce dry expanded microspheres in the **United Kingdom**. From them we produce blends, including our **pre-wetted** and completely **dust-free** **Microspheres 939** and **Microspheres 941**.

Photography by David Kilner



It's all in the Mix

Preparing your own fairing compound

Ingredients

Microspheres 941, epoxy resin and epoxy hardener is all that is needed to make an epoxy fairing compound.

Epoxy resin is the best choice where performance really matters, finding many different uses in boat building and repair. It delivers better strength, increases skin-to-core adhesion and improved water resistance (compared to other resin types). Epoxy resin also offers added toughness, creep resistance and improved resistance to deterioration caused by structural fatigue.

Hardeners for **epoxy resins** come in different types, A fast curing hardener is typically used in cold weather to speed up the curing process. A slow curing hardener is favoured in warmer temperatures to extend the working time of the resin. This can also be useful if you have a particularly complex project. It's important to note that increasing the quantity of a hardener will not make the resin cure faster. When choosing your hardener, consider the required working time, the ambient temperature, amount of epoxy that will be mixed and preferred cure speed.

Microspheres 941 is a completely dust-free microsphere blend, a pre-wetted version of our expanded microspheres. Dry expanded microspheres are an extremely lightweight, dry powder. By adding a suitable liquid it gives a product that is much easier to handle and disperse in resin.



Always follow the manufacturer's **safety instructions** and wear appropriate **personal protection** when working with all resins, hardeners and fillers.

It's important to **keep track** of the **quantities** of ingredients used to create the filler, as careful measuring ensures **repeatable results**.

Using the **mix ratio** specified by the manufacturer, thoroughly mix the **resin** and **hardener**. The **working time** of the resin, starts once the resin and hardener are mixed together.

Add **Microspheres 941** to the mixed epoxy, checking the consistency as you stir in the microspheres to determine if the mixture has the correct viscosity for your application. Ensure the microspheres are **thoroughly dispersed** as this will result in a smooth application. Small batches of putty can be **mixed** by hand, for larger batches a drill-driven stirrer may be preferred.

When the **weather gets colder**, the resin and hardener will become thicker and harder to mix. It is possible to use a water bath to lower the viscosity of the resin so it is easier for you to mix. Care must be taken to keep water out of the mix.



Application

In a few easy steps

Our Working Example

In our laboratory tests, we used an epoxy resin (700 mPas, standard Bisphenol A/F mixture) and an epoxy hardener (300 mPas, mixture of phenols and amines) at the required ratio of 65:35.

The ambient temperature was 20°C. The epoxy resin, epoxy hardener and Microspheres 941 were conditioned to this temperature prior to use.

Our results showed only **5% to 10% w/w** of Microspheres 941 was needed to modify the viscosity of our mixed resin:

5%, by weight, of Microspheres 941

- Ketchup consistency, typically used for bonding and laminating
- Not dripping off a vertical surface, but sagging

7%, by weight, of Microspheres 941

- Mayonnaise consistency, typically used for bonding and filleting
- Unstable peaks formed

10%, by weight, of Microspheres 941

- Peanut butter consistency, typically used for fairing and filling
- Stable peaks formed



The **quality** of the **finish** is in the **preparation**, so after the repair surface has been carefully cleaned and sanded, coat the area just sanded with a **thin coat** of **epoxy resin**. This **base coat** acts as a **key** between the substrate and the fairing compound. The **fairing compound** is applied when the epoxy resin coat is tacky, but not fully cured.

The liquid epoxy resin **base coat** is applied to the repair surface by brush or roller. As the resin begins to cure, the liquid begins to gel. Any further spreading of the epoxy resin during this initial polymerisation will damage its adhesive bond to the surface.

As polymerisation progresses the gel state becomes tackier and harder. The **fairing compound** should be applied when the surface is no longer in the gel state but still tacky – think masking tape. The time it takes to reach this stage depends on the hardener used and ambient temperature.

If the **base coat** has **fully cured** it will be necessary to clean and sand prior to over-coating with the fairing compound.

Efficient application of your fairing compound means **less wastage** and **less sanding**.



Words from the Professionals

Advantages

There are numerous **benefits** to creating a fairing compound with Microspheres 941:

- Dust-free
- No fine lightweight particles that easily become airborne and act as a respiratory irritant, as with Fumed (Colloidal) Silica or Glass Microballoons
- Easy to apply and shape
- Elastic and resilient
- Improved flexibility
- Light in colour
- Less dust when sanding
- Less eye or respiratory irritation; dust does not contain broken microballoons with sharp edges
- Less wear on tools
- Microspheres 941 can withstand repeated loads of pressure without breaking, unlike glass microballoons
- Reduced cracking
- Reduced shrinkage
- Smooth surface, no pinholes



Don't just take our word for it, here's some comments we received from **professional surfboard shapers** after they made their own fairing compound with Microspheres 941 for the first time:

"I've used it on a few repair jobs and it mixes in well with epoxy and polyester resin. Turns into a really nice pliable filler and hold for vertical filling applications."

"Its sands really well too and is super nice to sand by hand for critical shaping."

"It's great that I'm not getting any air born when mixing like I do with other fillers so therefore being safer to use."

"Nice light colour, very buildable putty, sands very nicely."



What's Next?

Further Reading

Our **Application Guides** and **Case Studies** show the many other ways in which expandable microspheres can be used:

- Adhesives
- Automotive bodyfiller
- Concrete
- Crack filler
- Elastomeric coatings
- Fairing compounds
- Faux leather
- Faux marble
- Filling compounds
- Leather finishing
- Lightweight foam
- Modelling board
- Modelling clay
- Paints & coatings
- Plastisols
- Polyester putty
- Porous ceramics
- Printing ink
- Rubber
- Sealants
- Silicone rubber
- Technical textiles
- Thermoplastics

If your application is not listed, then please get in touch so we can help you.

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



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

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.