

PRODUCT BULLETIN

Fillers

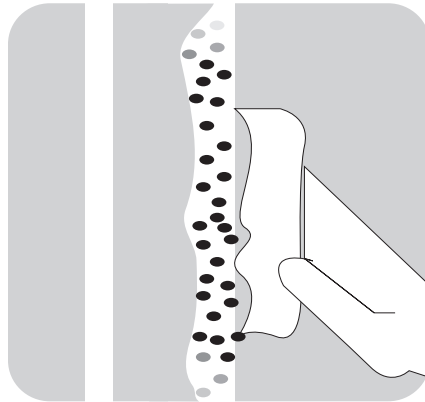
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Cab-O-Sil

Microspheres

Milled Glass Fibers

Chopped Fiber Glass



Add to polyester or epoxy resins to:

- make resin easy to sand
- strengthen bond properties
- thicken resin to patch/fillet
- reduce cost of resin mixture
- improve abrasion resistance
- reduce weight, shrinkage, or exothermic heat

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Tips

Some fillers can be difficult to mix by hand, due to their extremely fine particle size. Use a Squirrel Mixer (available in a TAP store) for mixing fillers thoroughly into resin. However, when mixing Microspheres with a Squirrel Mixer, do not over-mix, as they may break apart causing a reduction in their beneficial properties.

Add fillers in small quantities, especially as you approach the thickness you desire. Resin can thicken suddenly with the addition of very little filler.

Use resins that provide adequate preparation time, Mixing fillers can be a time consuming process which depletes your working time.

Fillers can reduce the shrinkage of polyester resin.

Beware of heat build up during the curing process. Excessive thick layers of resin can get quite hot and possibly damage the surface being bonded.

Experiment with cure times. Fillers can affect the cure times of resins.

Other fillers, besides those mentioned above may be used. Dry sand is an economical filler, which will reduce resin use (and cost), and create a hard abrasion resistant surface. It is excellent for repairing cracks in concrete.

Using Fillers to Transform Resins

When added to polyester or epoxy resins, fillers can dramatically change the properties of the final product.

Use fillers when you want to:

- thicken resin into putty for patching or filleting
- cause low viscosity resin to hang on a vertical surface
- create an easy-to-sand resin
- reduce the cost of a resin mixture
- strengthen bonding properties
- improve abrasion resistance
- reduce weight, shrinkage, or exothermic heat

Both polyester and epoxy resins readily accept fillers with similar results. When resins with fillers are used for bonding and adhesion, epoxy is recommended because of its adhesive properties. Fillers can affect the pot life of the resin. It is always best to experiment with small quantities first to understand how much working time (pot life) you will have to complete your project.

Where to Use TAP Filler

| | Cab-O-Sil | Microspheres | Milled Fibers | Chopped Strand |
|-----------------------|-----------|--------------|---------------|----------------|
| Fillets | Best* | Best* | — | — |
| Bonding | ✓ | — | ✓ | — |
| Surf/Sailboard Repair | — | ✓ | — | — |
| Fairing | Best* | Best* | — | — |
| Strength | ✓ | — | ✓ | Best |
| Sanding | — | Best | — | — |
| Bulking Out | — | ✓ | — | — |
| Reduce Weight | — | ✓ | — | — |
| Vertical Surface | Best | — | ✓ | — |
| Reduce Shrinkage | — | ✓ | ✓ | Best |
| Fill Holes | ✓ | — | ✓ | ✓ |

* Combine Cab-O-Sil and Microspheres, see paragraphs below.

Safety

Always work in a well ventilated area. Wear a dust mask when working with fillers, and especially when sanding. Avoid skin contact with resins. Wear rubber gloves.

Cab-O-Sil

Cab-O-Sil is a superfine fumed silica. When Cab-O-Sil is added to resin at least three properties of that resin change: viscosity, thixotropy, and bond strength. When used in small amounts (1%-3% by weight or 2 parts resin to 1 part filler by volume), Cab-O-Sil does not significantly change the viscosity but does improve thixotropy, making the resin suitable for vertical applications with minimal run off.

When used in higher concentrations (3%-7% by weight), Cab-O-Sil can transform the viscosity of resin from a *syrap* to a consistency like *peanut butter*. When roughly equal volumes of resin and Cab-O-Sil are mixed, the result is a translucent paste similar to *petroleum jelly*. Experiment to create the consistency you desire.

Thickened resin can be used for hole/gap filling, filleting, and bonding porous and nonporous objects. See below for bonding instructions. Cab-O-Sil creates an extremely hard, somewhat brittle, abrasion-resistant surface. Cured resin with Cab-O-Sil is very difficult to sand, so use care in application to avoid sanding problems. Combine with Microspheres to create a putty-like mixture for sanding.

Microspheres

Microspheres are just what their name suggests, microscopic hollow glass spheres. By virtue of their shape, microspheres act as tiny ball bearings, providing better flow properties than other fillers. When added to resin they displace the resin with air, creating a thick but very low density compound. Microspheres increase impact resistance, make resin much easier to sand, and are more economical than buying pre-mixed compounds. They are an excellent filler for surf and sail board repairs.

Microspheres will thicken a resin, but even in a thickened state, the resin can sag because Microspheres are not thixotropic. A one-to-one mix by volume will yield a very viscous but flowing liquid. Two parts Microspheres to one part resin creates a consistency like *peanut butter*.

When a resin filled with Microspheres is sanded, the surface becomes porous. So do not use this piece below the water line unless it is sealed with several coats of TAP Premium Marine Grade Epoxy.

Use care when mixing Microspheres with a mechanical mixer. Microspheres are fragile, and excessive mechanical mixing can crush the spheres and destroy their properties.

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