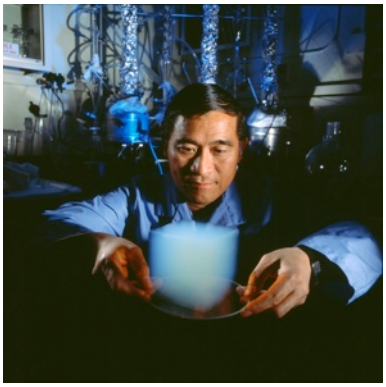
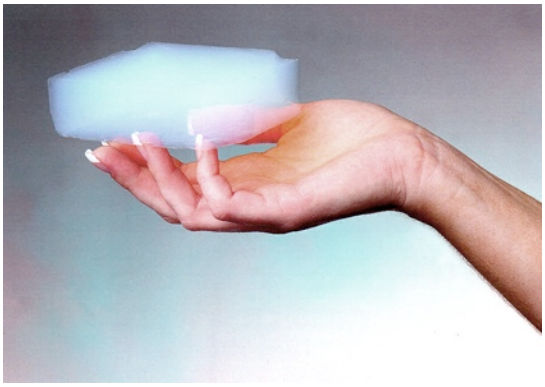
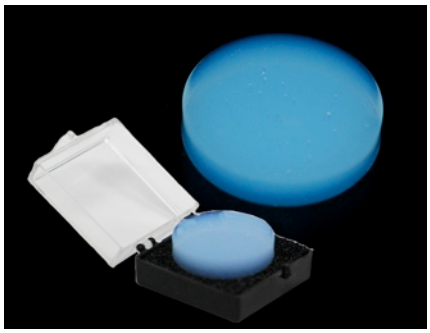
AEROGEL FAQs





What do I get when I order one disk?

You get a disk sample of the extremely hard-to-find transparent monolithic form. Great for gifts, science projects and display. The disk with diameter of 27 mm and thickness of approximately 7 mm comes in a clear padded gift box. Each aerogel disk is supplied with a handling / fact card with a link to an informational mobile website about the samples.



What is aerogel?

Aerogels are a class of ultra-low density, nano-porous solid foams with impressive insulating capabilities, strength-to-weight ratios, and many other amazing materials properties, not to mention a striking ethereal appearance. The density is ~ 0.095 g/cm^3

How are the aerogels made?

The aerogels start their lives as wet gels physically similar to edible gelatin. The chemistry used to synthesize these gels depends on the type of aerogel. For silica aerogels, the gels are formed through the sol-gel process using silicon alkoxides. After setting, the gels are soaked in an organic solvent to remove excess water from the gels. Next, the gels are placed in a high-pressure autoclave and soaked in liquid carbon dioxide until most of the organic solvent has been displaced by carbon dioxide. Finally, the vessel is heated past the critical point of carbon dioxide and isothermally depressurized to remove the carbon dioxide from the pores of the gels without causing capillary collapse of the gels. The result is the isolation of the low-density, solid, nano-porous structure of the original wet gels from their liquid medium, leaving an aerogel. Once the vessel has been depressurized to ambient pressure, it can be opened and the aerogels removed.

Is aerogel safe?

Aerogels are a diverse class of materials and, as such, the toxicity of a particular type of aerogel depends largely on what it is composed of. Monolithic aerogels of the type sold by Prof Bunsen Science are safe to handle and work with, although if you intend on breaking, crumbling, or attempting to machine them, you should avoid inhaling nuisance particles by wearing a breathing mask.

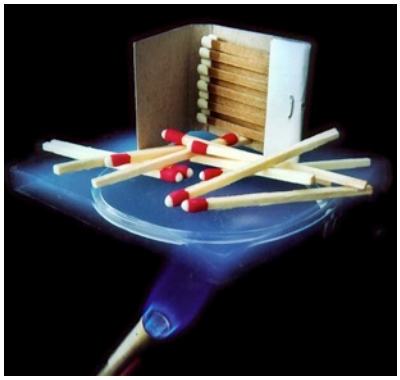
How strong are the aerogels you sell?
The aerogels have high strength-to-weight ratios like other aerogels, however they have not been specially modified to improve their resistance to fracture and break easily so they should be handled carefully.

I broke my aerogel disk. Can I return it?
Aerogels, like glass and other materials, do break if not handled properly and we cannot replace broken aerogel.

My aerogel was cracked/broken on arrival. Can I get a new one?
We make every effort to package our aerogel disks so that they arrive at your address in tact. Please contact us if you receive them broken - which should rarely be the case.

Can you machine aerogel?
Not really. You can always try, but in general aerogels that have not been specially strengthened are friable (that is, they tend to fracture and cleave into tiny chunks).

If one uses a small pencil gas torch - can the thermal insulation properties be shown?
You certainly could demonstrate so, but it might be better to place the sample on a hot plate, and put a thermometer probe on the top.



Does aerogel soak up water?
It's also important to note that aerogel is extremely hydrophilic - if you put a drop of water on the sample it will soak it up like nothing you've ever seen - *but this destroys the sample in the process*.

Can it suspend a heavier object without breaking the aerogel?
This kind of test must be done carefully - slowly stacking coins on the top will be a good demonstration of the inherent strength of aerogel, but it must be kept in mind that this is a fairly brittle material - and will shatter if stressed unevenly. The best analogy we can use is to say that it's as fragile as a Rice Crispy, but 96% air.

If I drop it on the table will it break?
Depends on how high you drop it from! We have dropped samples from head-height without any damage, but they tend to pick up dust. It's a really strange material!

Photos: Courtesy of NASA
Information: Supplied by Aerogel Technologies