

Aerogel

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Aerogel is a synthetic porous ultralight material. It is a porous material because it contains many pores(voids), that are filled with air which makes it the lightest material (seven times lighter than air!)



Allowing it to do amazing things such as letting a big block of it rest on flower buds. It also has another amazing property of being a very good thermal insulator, these two properties allow it to be an amazing addition to a spacecraft because it's good for insulating a hypersonic-inflatable-aerodynamic-decelerator because it is extremely light alongside being a great insulator meaning it has no effect on the weight of the aircraft while protecting the aircraft from intense heat from coming down to earth.

Young Modulus

Even though the **aerogels** have very low densities ($\sim 0.05 \text{ g/cm}^3$) and very low **Young's modulus** ($106\text{-}107 \text{ N/m}^2$), **aerogels** behave as linear **elastic** materials [4, 5]. Holographic interferometry has been widely accepted as a viable tool for non-destructive testing of materials.

How is Aerogel Made?

Aerogel is made by removing the liquid from a gel like substance, while maintaining the actual structure of the aerogel. This allows for the aerogel to be lighter than air giving it amazing properties.