

Sandwich Fabrication

The Focused Sun hybrid achieves fast payback by making its mirrors by sandwich fabrication. Sandwich fabrication is a way to make strong, flat structures with adhesive bonding. Sandwich fabrication first got its start with military aircraft in the 1970s. Lockheed’s C5A airplane used sandwich fabrication to make strong light-weight ramps that could withstand the load of trucks driving into its equipment bay.

Since then, sandwich fabrication has been used in applications as varied as packing material to IKEA furniture to aerospace structures on Boeing’s 777 airplane. Below are examples of sandwich fabrication from cheap to expensive depending on the “face sheets” and “core” used. Sandwich fabrication has a high strength face sheet on each side of a light-weight core.

The cheapest sandwich fabricated panels use paper face sheets with a paper honeycomb core. The most expensive use aluminum face sheets with aluminum honeycomb core for aerospace applications. Between these are IKEA furniture (hardboard face sheets with a paper honeycomb core) and commercial office partitions (aluminum face sheets with paper honeycomb core).



	Face Sheets	Core
Packing	paper	paper
Early Mirror	hardboard	foam
Early Mirror	plywood	foam
Furniture	hardboard	paper
Office partitions	metal	paper
Aerospace	metal	metal

Focused Sun has experimented with various face sheets (hardboard, plywood, metal) and cores (paper honeycomb, plastic foam core). We found that workers can handle foam core much more easily than honeycomb core. For face sheets, we picked galvanized steel that is both durable and strong.

Sandwich fabrication has become popular because it is the most efficient structure for withstanding distributed loads. “Efficient” here means that it uses the least material to withstand a given load. A solar mirror needs to withstand the wind, a load that is distributed over the mirror’s surface. Sandwich fabricated mirrors are both cheap and strong.