



FRP3D

Sandwich 2.0

Foam and honeycomb cores are used extensively in composite products, resulting in lightweight structures with high stiffness. However, complex sandwich shapes are difficult and expensive to manufacture. We introduce FRP3D, which allows us to create highly efficient 3D printed sandwich products.

Sandwich structures are used often in markets like wind energy, marine and transportation. The main functionality of a core material is to increase the bending stiffness by increasing the distance between facings. For optimum performance, the compressive and shear properties of the core are the main mechanical factors when deciding on a core material.

With the FRP3D process it is possible to make the core a principle part of the design process. No longer does a designer have to stick with constant thickness cores and single curved surfaces: true 3D objects are now possible.

Topological optimisation

When the product is designed, the core can be optimised. In most cases a honeycomb or truss layout of certain density will be selected and used throughout the part; this will give constant properties throughout the complete product. However, in some instances where, for example, load cases can accurately predicted,

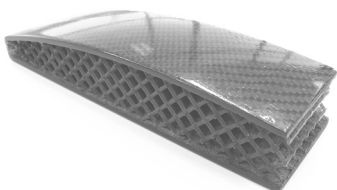
or where certain areas are prone to compressive loading and others are not, the core layout can be varied throughout the product—this process is generally called topological optimisation.

Superior performance

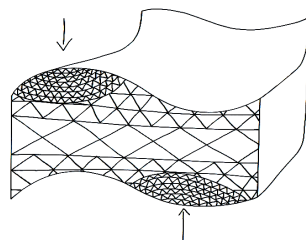
The resin material that is used to generate the FRP3D core, has properties equal to standard non-filled resin, which is much greater than that of foam. Additionally, all segments can be placed in optimal load directions, 45° in case of pure shear. These factors make that the performance of a FRP3D core is much better than a standard foam core, but still as light: starting at 60 kg/m³.

Applications

FRP3D printed cores can be part of any composite structure where the use of normal foams or honeycombs is cumbersome, expensive or limits the possibilities of the product.



Printed carbon reinforced sandwich



Topological optimisation

High strength

Our materials have high mechanical properties, ensuring the best possible composite performance

Large size

We can produce seriously large parts. Unlike most 3D printers, we can go up to meters in our production.

Complex Geometry

We do not require a mould in our process. This allows us to create more complex shapes than ever before.

Functionality

In our printed products we can include ducting, inserts or sensors. This makes it possible to combine functionalities.

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