Graphite Carbon Fibre Beams

. . . A Revolutionary, Disruptive, or Sustaining Technology ?
for the CNC Machine Building Industry

The CNC Machine Building industry is the supplier for the competition that is driving most industries, worldwide, to seek ever increasing productivity in the face of soaring energy and material prices. This industry is about to witness a new technology that will see the productivity of their machines **double**. This technology is driven by beams made of **Carbon and Graphite Fibres** from **CompoTech**

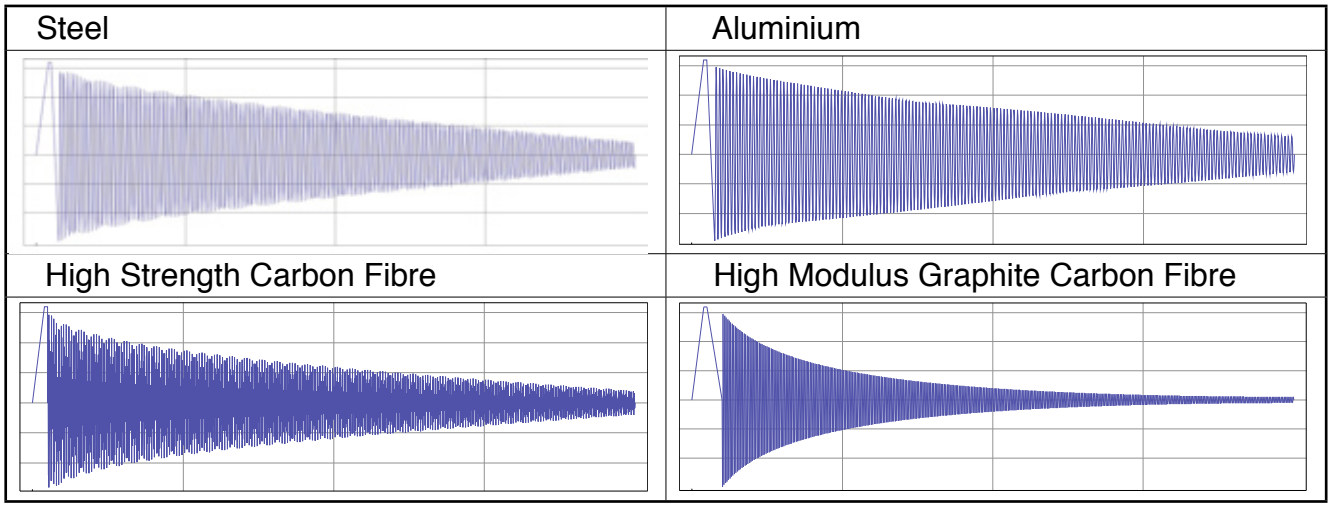
The reason is simple. Carbon and Graphite fibres have unique elastic modulus, thermal expansion, thermal conductivity and density properties. For Graphite Fibres in a suitable matrix, these properties are significantly better than any other conventional alloy material.

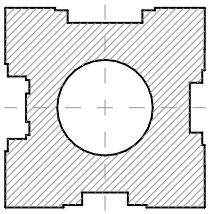
CompoTech have developed a new production processes that capture these properties and are able to supply beams to the CNC Machine building sector that have significantly improved **vibration** and **thermal stability** characteristics. The **Natural Frequency** of these beams can easily **be three times higher than steel**, and the **axial thermal expansion can be nearly zero**

The **CompoTech** beams are a **Graphite** and **Carbon Nano Tube Epoxy Composite** and come in several sizes. They have integrated corner tubes for easy connection to other parts and/or conduits for services. A unique sensing option can be incorporated to make the beam a "**Smart Structure**". The designs can be easily varied to suit the customer and the production method enables short lead times, little wastage and competitive pricing.

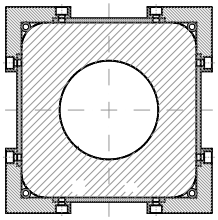
Consider the Properties of the Materials

Make a simple experiment to see how the vibration decays for each material.
Compare the Natural Frequencies.





Study the Maths to see the possibilities



All Steel		Graphite Carbon + Steel Corners
260mm x 260mm	Dimension	260mm x 260mm
834 Kg	Weight	303 Kg
210 GPa	E Modulus of Parts	GC 360 GPa St 210 GPa
4.7 x 10^{13} Nmm^2	E x I Stiffness	GC 4.6x$10^{13}$$Nmm^2$ St 1.8x$10^{13}$$Nmm^2$
562 Hz	Natural Frequency	1354 Hz

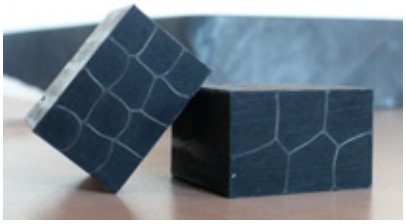
Carbon Nano Tube Epoxy Resin

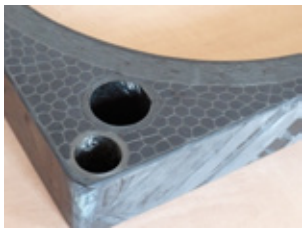
CompoTech have been successful in using an Epoxy Resin with Carbon Nano Tubes in our unique process. It significantly improves the toughness and the compression strength of a composite and is now well proven..

New materials and theoretical possibilities are not enough. There are 2 problems that are always a difficulty when using Composites materials. CompoTech has a solution for each of these problems with 2 new patent pending technologies.

3D Stresses

By developing a patented cellular structure it now becomes possible to use large volumes of Graphite Carbon Fibre in a structure that is capable of handling the complicated stresses that occur in all other directions in any practical application.





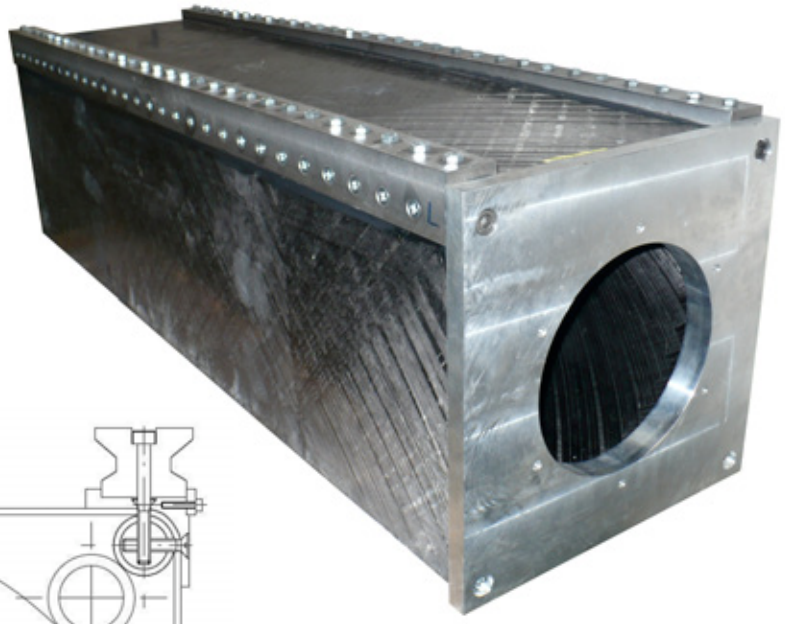
Improves Transverse modulus	+ 300%
Transverse Compressive Strength	+ 200%
Transverse Tensile Strength	+ 300%
Shear Modulus	+ 200%
Interlaminar Shear Strength	+ 30%
Axial Compressive Strength	+ 30%

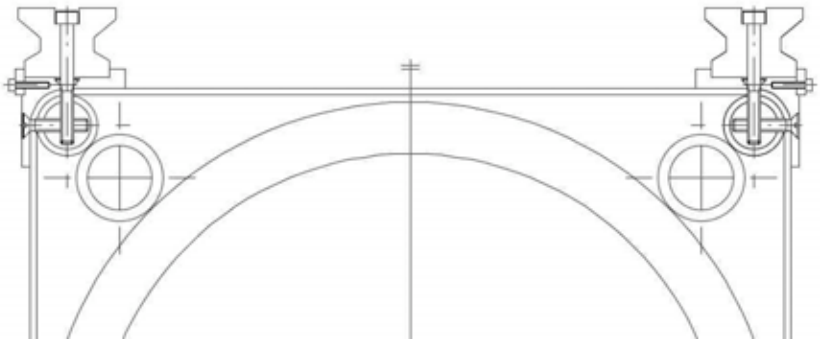
CompoTech's 3D Technology ***enables*** solid volumes of Graphite

……and makes these beams possible

Connections to other parts

All machinery and structures are an interconnection of many parts that are essential for the operation of the equipment and a high performance material is only useful if it can be integrated effectively with the other essential parts. The holes in the corners of the section are for mechanical fastenings to locate and augment the bond between steel and the Carbon Graphite Composite





Possibilities

The tooling allows for a significant degree of flexibility to suit most individual circumstances.

Please consult CompoTech about your requirements and be prepared to disclose everything relevant about your project.