



# RESEARCH THESIS

## Carbon Crashbox

In Formula Student, the crashbox is a critical safety component responsible for absorbing impact energy while maintaining minimal weight.

To achieve an optimal balance between structural performance and lightweight design, advanced composite materials such as CFRP are used. A legality box defined by FSG must be met.

Their highly anisotropic behavior makes simulation and design particularly challenging. Furthermore, crash simulations are especially difficult.

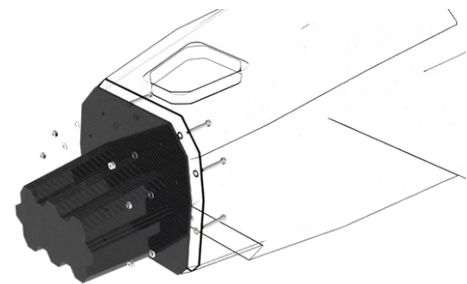
The aim of this thesis is to develop and optimize innovative CFRP crashbox designs using FEM, and iterative Testing. The minimum absorbed Energy as required by the FSG Rules must be met.

The Final Design is to be manufactured and tested in a crash test.

This thesis will most likely be done in cooperation with the IFB.



<https://infinityracing.de/wp-content/uploads/2021/05/mono2-2.png>



<https://www.datocms-assets.com/53444/1726043943-method-of-attaching-the-ia-assembly.png?auto=format&fit=max&w=1024>

## Tasks:

- Design (& simulate) CFRP Crash
- Evaluate designs
- Manufacture most promising design and prove functionality

## Requirements:

- FEM experience
- CAD basics
- CFRP experience
- Become team member