

Manufacturing process wings for formula one cars using with ribs

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Manufacturing Process Wings for Formula One Cars using Sandwich Panel Structures Composite s (Date)

Manufacturing process wings for formula one cars using Sandwich panel Structures composite:

Sandwich core materials are constructed by laminating the outer skin using conventional means via a mould and then the core material is laid into a wet laminate. In this process, the inner skin is laminated onto top core part and then sealing it effectively.

Most of the parts of a formula one cars are made using carbon fibre. Seos (2014) noted that most parts of the formular one car are manufactured using the rapid prototyping method (RP). Below are the steps taken in the manufacture of the wings of Formula One cars; the steps in the manufacture of Formula one car wings.

Step 1:

This is the first step and it entails the design process of the parts of the wings. According to Keynes (2014), software such as Siemens, product lifecycle management software permits the racing engineers to improve product design and production process, as well as attaining design iterations in the virtual environment. In that perspective, this process involves choosing the shape and patterns of the wings and its parts. This step also focuses on the optimization of the aerodynamics of the wings to ensure efficient output during the racing process.

Step 2:

This is the second step and it involves the manufacture of the designed parts. The materials used in this process is carbon fibre and its foams. As

cited by. (Wood, 2013) moving from the concept of aerodynamic to a carbon composite fit for the racetrack needs a significant bunch of engineering processes and tools and processes.

The designed patterns are moulded, produced and taken to a clearing chamber where several layers of carbon fibre and carbon forms are put together in layers. The parts, according to the design, may take up to 100 layers of carbon foams. After the layers have been put together, they are then sealed together and then put into a vacuum chamber to remove air. The vacuum chamber then sucks the air out.

Step 3:

The third step involves forwarding the put together layers into a chamber for a curing process. The layers are then subjected to a high pressure of up to seven atmospheres at a temperature of up to one hundred and nineteen degrees Celsius. This results into the binding of the layers together by squeezing.

The bending process is actually handled by the spars that run the span of the wing. Besides, the outer skin needs to be tailored towards avoiding skin buckling since the wings have the capability of flexing and bending.

Step 4:

The fourth step involves the assembly of the different parts of the wings to make a complete functional wing. The different parts are bind together using rivets. In cases of a front wing, a main plane is made onto which one or more flaps, which are adjustable, are fitted. Each of the main plate is then fitted with end plates.

The flaps and the end plates can be made by using Rohacell core. The

procedure entails machining the core to be the same as the mould shape and then wrapping the carbon around and then proceed to put the whole into the mould. With controlled crushing of the core provides the consolidation (Ben, 2009).

Assembly Process of Aerofoil

1. Assembly of aluminum ribs, connecting rods and foam inserts.
2. Insert internal assembly into carbon fibre exterior.
3. Glue winglets to end of panels.
4. Bolt housing to underside of aerofoil.
5. Weld housing to chassis.

References

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