

Composite mounting tray



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The Avionics equipments are integrated on various aircrafts using mounting trays. Modern day aircrafts are designed with avionics bays where the avionics equipments are mounted. The mounting tray is an interface between the avionic equipment and the aircraft frame.

These mounting trays should withstand all the dynamic loading conditions like random vibration, Sine on random vibration, gun fire vibration, shock & arrestor landing shock, etc. depending on the aircraft requirements.

At the National Centre for Aerospace Innovation and Research (NCAIR), the design and production of the mounting tray is performed by taking into consideration the current challenges and improvisations in the material and design which is currently available. The mounting tray is made by conductive carbon fibre composites which are very good in strength and are good conductors of electricity. They are made by unidirectional or bidirectional fibres with or without the angled laminates. The epoxy system used is the one which is available in the open market used for making the carbon fibre reinforced composite.

In this endeavor, we have achieved the overall weight reduction in the mounting tray of around 50%. Also, there is no resonance at 0.5 g / 1.0 g from 5 Hz to 2000 Hz per axis before and after endurance vibration. The tray can withstand three 50 g shocks in vertical and three 22 g shocks in lateral directions all of 11 milliseconds without failure and it can survive 4000 ± 10 bumps at peak acceleration of $400 \pm 40 \text{ m/s}^2$, of 6 millisecond in vertical axis. It can endure the temperature between -60°C and $+71^\circ \text{C}$ for more than 16 hours and withstand humid and salt fog environment according to MIL standards. With all these improvisations, it has eventually reduced the assembly time and is proved to be a low cost product.



Composite mounting tray - Manufacturing in process