## Innovative Materials Selection:

### Material Proposed as in PDR:

As in Preliminary Design Report (PDR) of our CANSAT had:

|  |  |  |  |
| --- | --- | --- | --- |
| Serial No. | Component | Previous Material | Modified material |
| 1. | Outer Body Panels | ABS Polycarbonate Sheets | ABS Polycarbonate Sheets |
| 2. | Vertical Rods | 2024 T3 Al Alloy | CFRP Z-100 |
| 3. | Horizontal Bases | 2024 T3 Al Alloy | CFRP Z-100 |
| 4. | Circular Support Rings | -- | CFRP Z-100 |
| 5. | Top Lid | Polyethene Film | Polyethene Film |
| 6. | Parachute & Chords | Ripstop Nylon | Ripstop Nylon |

**Reason to Change Materials:**

* The change in the material of the structure including the Vertical Rods, Horizontal bases and the circular ring support were previously proposed as to be made up of 2024 T3 Al Alloy which is replaced by Carbon Fiber Reinforced Plastic (CFRP) because of the following reasons:

1. **Stress-Strain Curve:**

Lower yield point of the Aluminium in general which would have led to the increase in the deformation as compared to that of the CFRP. Also the ductility as a property in not needed for our use.

1. **Availability:**

Market availability of the Aluminium and it’s alloy is very rare due to the import and export restrictions and also due to the scarcity in the global market and so is not the case with the CFRP Z-100 as the spools, sheets, rods, and plates all are available in the local market.

1. **Economics:**

The cost of Aluminum is too high and cannot fit in the budget constrain of CANSAT whereas cost of CFRP is relatively lower than 2024 T3 Al Alloy.

## Material Acquisition:

* Material for prototype testing was received in early January 2023 but it was sample piece used to validate our own mathematical model as computed.
* Material to be used in the fabrication of the main structure have been ordered and are in process.
* We have received all our electronical components as ordered for the testing and analysis purposes.

## Changes in Mechanical Design Dimensions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Changes Made** | **Previous Dimensions** | **Previous** | **New Dimensions** | **New** |
| Increased Rod Diameter in Battery and Gyro Compartment | 5 mm | A picture containing rectangle  Description automatically generated | 7 mm | **A picture containing text, yellow  Description automatically generated** |
| Increased thickness of Base Plate and Parachute 2 Base Plate | 2 mm | A picture containing logo  Description automatically generated | 5 mm | A picture containing shape  Description automatically generated |
| Increased Parachute 1 Base Plate thickness | 2 mm | A picture containing transport  Description automatically generated | 7 mm | A picture containing shape  Description automatically generated |
| Added a support Plate to increase strength in Parachute 2 Container | 0 mm | A picture containing shape  Description automatically generated | 5 mm | A close up of a toy  Description automatically generated with low confidence |
| Added a hook to grab parachute | - |  | - | A picture containing text, yellow  Description automatically generated |

# A picture containing handcart Description automatically generatedRectangle Description automatically generatedPhysical layout:

Fig. Home View of CANSAT without body panels

Fig. Home View For CANSAT

Icon

Description automatically generated with medium confidenceA picture containing map

Description automatically generated

Fig. Bottom View of CANSAT

Fig. Top View of CANSAT