

Design of Enclosure for Videoscope Module

Scope : Enclosure Design

Application : Inspection and Diagnostics

A videoscope is essential for automotive inspection, allowing detailed, non-destructive examination of inaccessible areas like internal engine parts, transmissions, exhaust systems, and more. It detects issues in inaccessible areas, improving diagnostic accuracy and efficiency. By enabling early problem detection and preventive maintenance, videoscopes help save time and reduce repair costs, ensuring optimal vehicle performance and reliability.



The client's request for a sturdy enclosure, for their portable inspection videoscope module presented a significant design challenge for us.

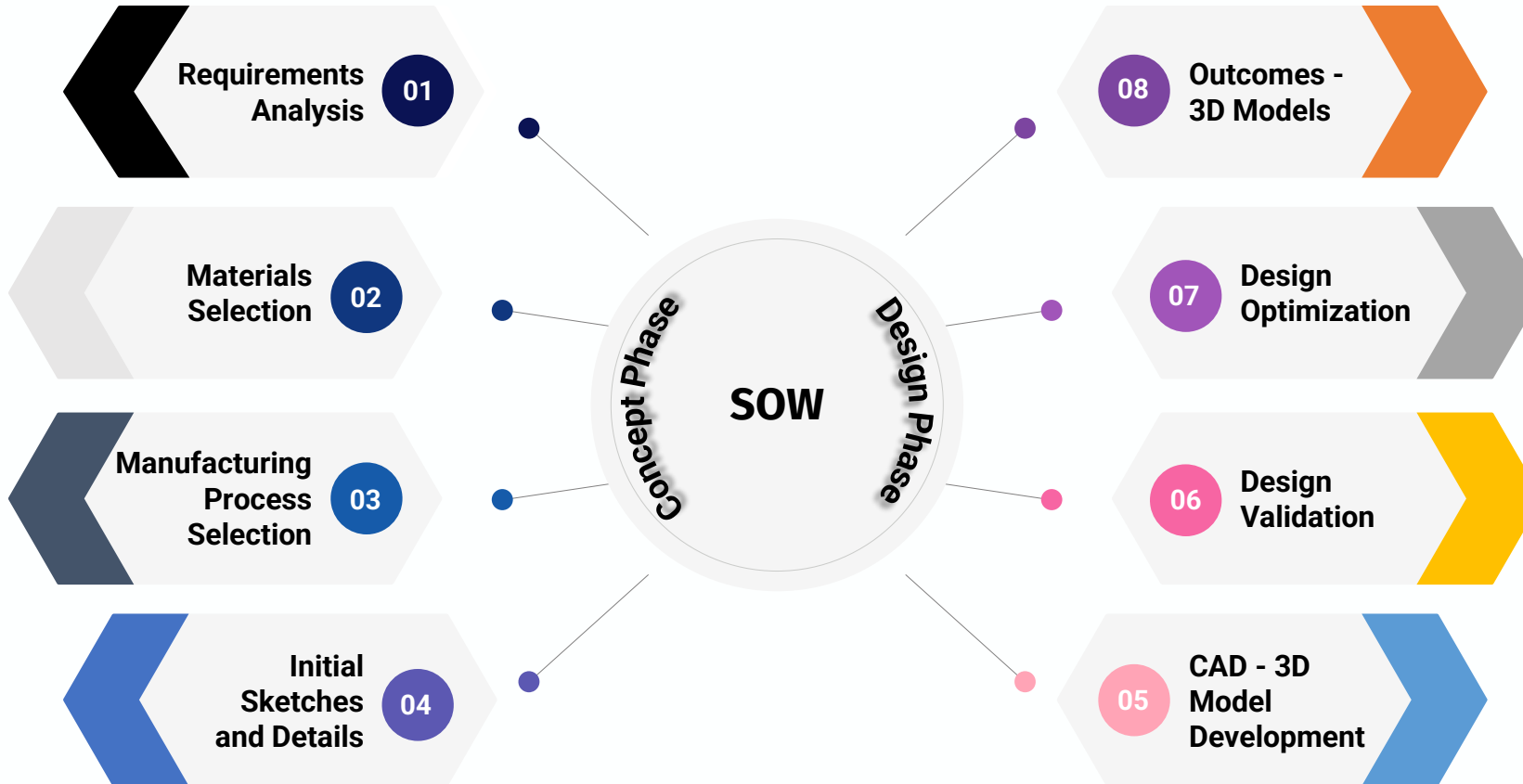
Challenges

- ◆ Provision for Camera Cable Accommodation
- ◆ Opening for USB Charging Port with Protective Cap
- ◆ Storage Compartments for Accessory Parts
- ◆ Optimization of Mounting and Installation
- ◆ Designated Areas for Assembling Components like Buttons, Display, etc.
- ◆ Material Selection for Durability and Environmental Resistance
- ◆ Aesthetically Pleasing Design
- ◆ Accessibility for Maintenance and Portability
- ◆ Adherence to Regulatory Compliances
- ◆ Cost-Effective Solutions



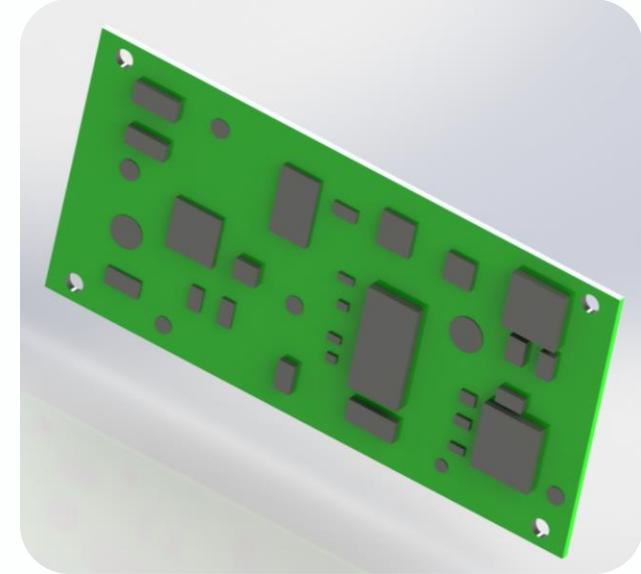
Conceptualization Phase

Design Development Phase



Requirements - Analysis

- PCB “STEP” file for Dimensional accuracy and fit
- Cut out and Height restriction details
- Keep-out area information
- USB connector location details
- Storage requirement details
- Additional document contains any other relevant details for enclosure design.



Materials Selection

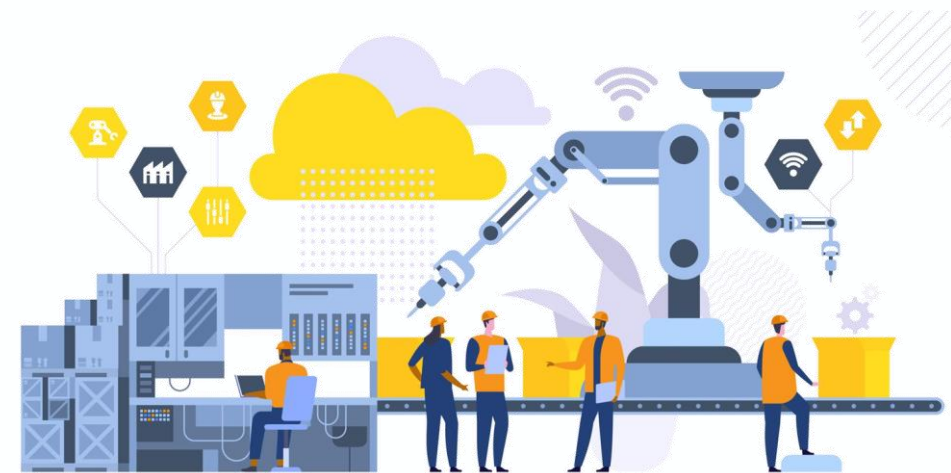
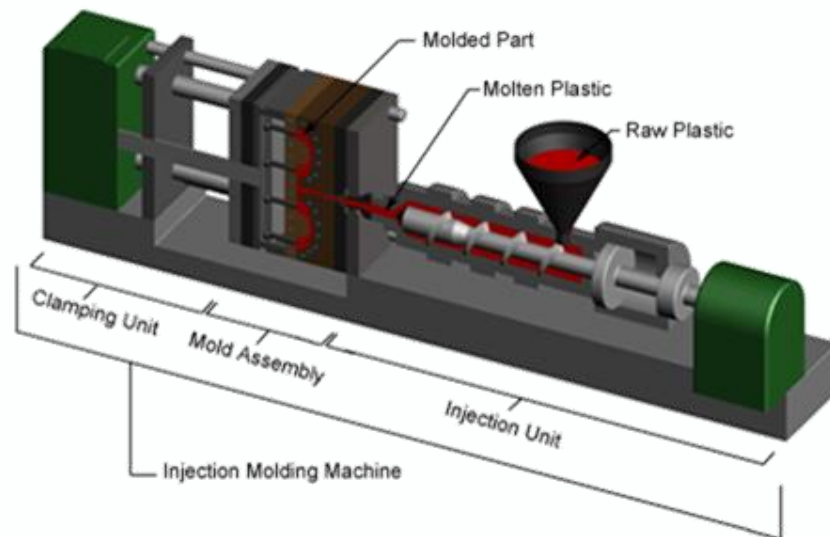
Plastic Material is selected for this enclosure. It Provides excellent durability, cost effective, and light weight, this will be ease for maintenance and perfect suit for this application.



Manufacturing Process

Injection Molding is the effective manufacturing process for this enclosure design based on the following factors

- Tight tolerance manufacturing
- Excellent repeatability
- Fast cycle time
- Cost effectiveness



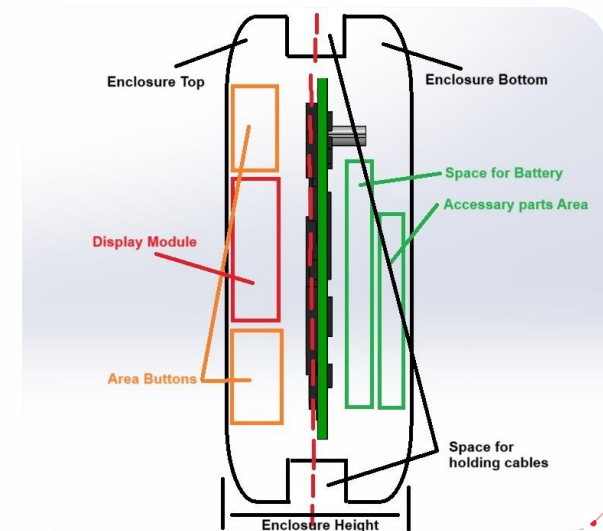
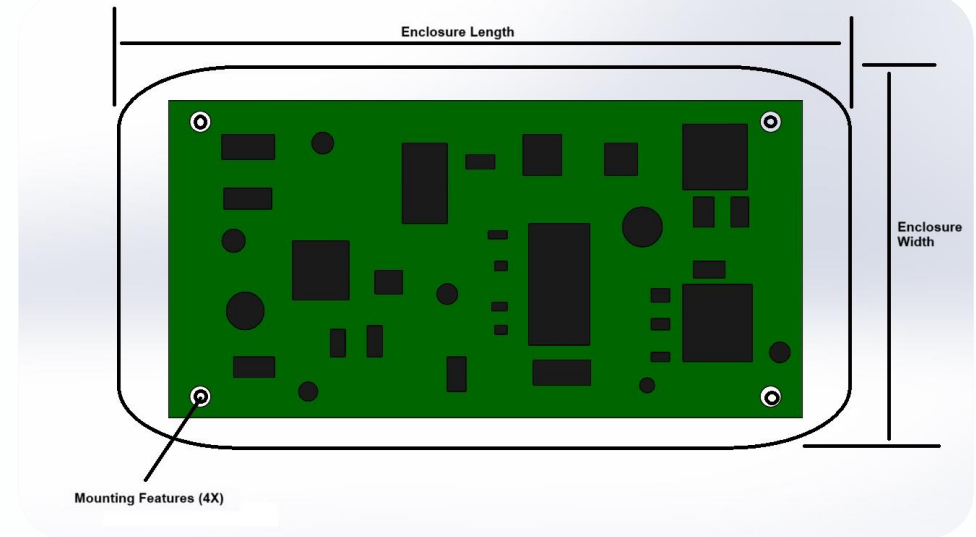
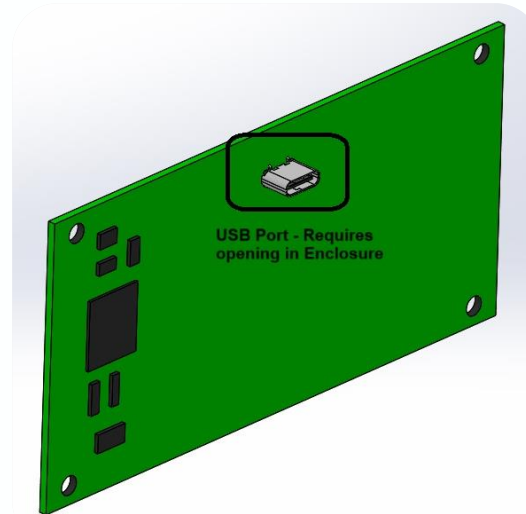


Sketching & Details: Initial Sketches

Enclosure Shape & Size Plan

Rough initial sketches are drawn with the details related to cutout for USB connector, compartment for Accessory parts and others, etc.

- Enclosure Size (Length x Width x Height)
- Storage compartment
- Space for other assembly parts
- USB Port Cutouts requirements
- PCB Mounting techniques



CAD Model Development

From the sketch details, 3D modeling is initiated and design optimizations are completed based on the discussion with the client to meet the requirements.

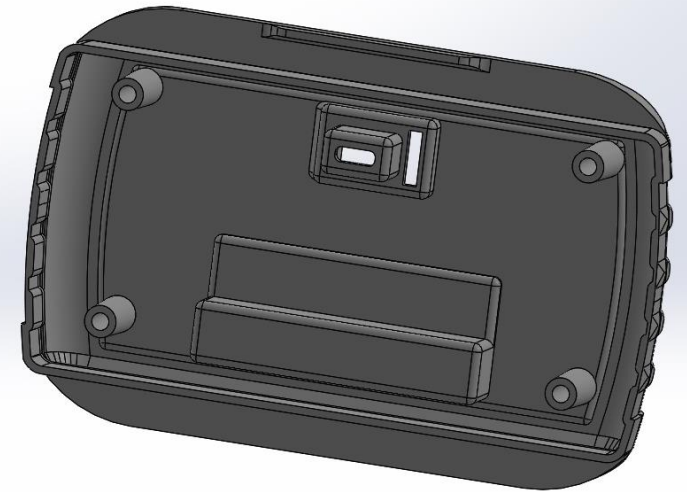
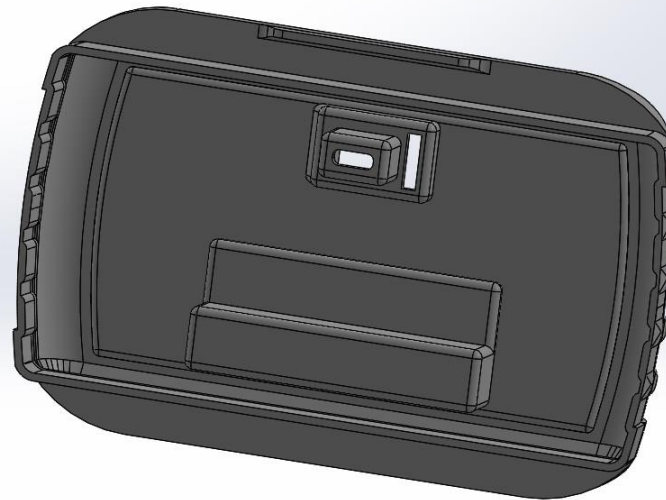
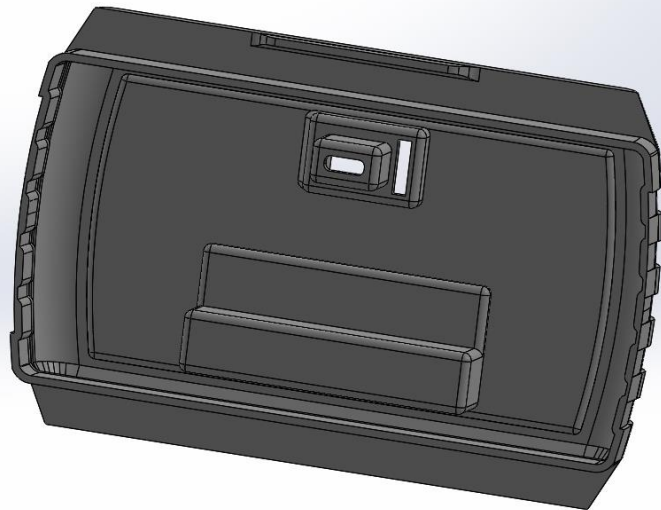
Flow: Outline Design



Design Optimization



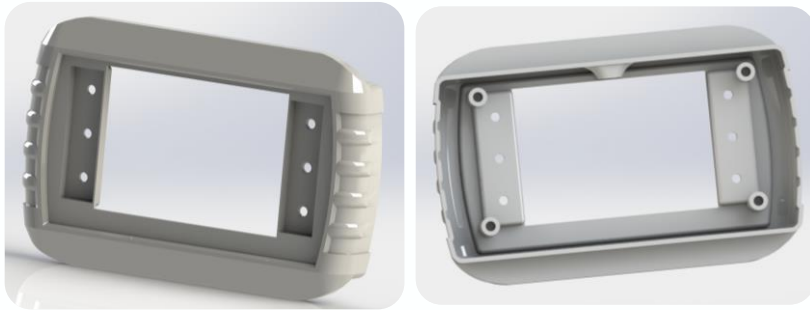
Aesthetic Improvements



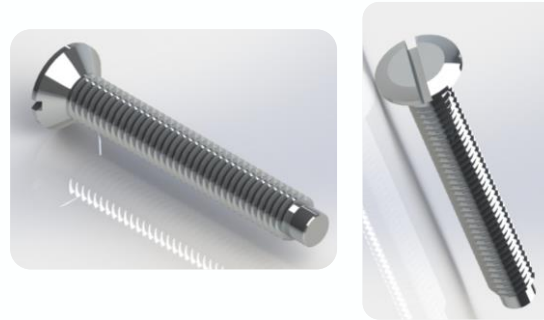


Individual CAD Models

Top Enclosure



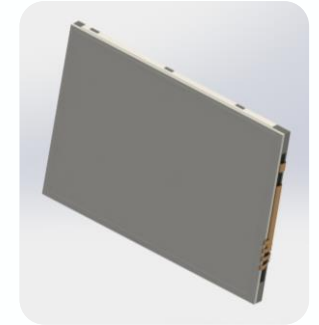
Screws



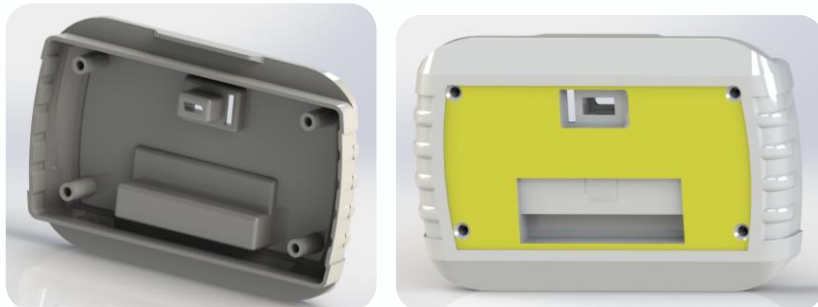
Top cap



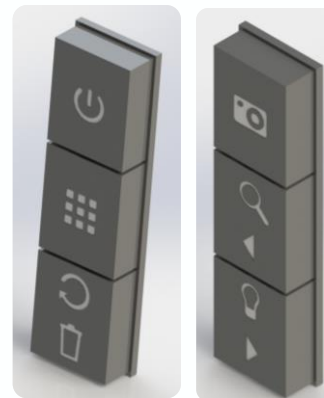
Display Module



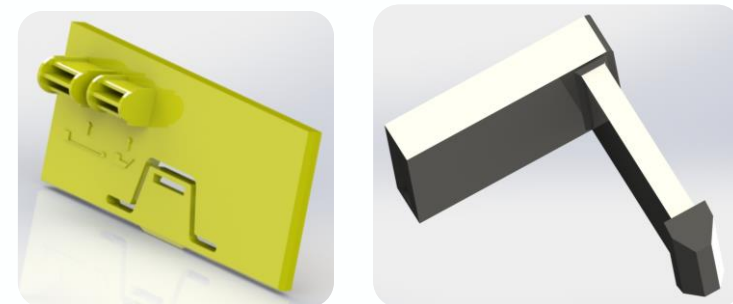
Bottom Enclosure



Buttons



Accessory & Port Doors





Final Enclosure CAD Model

Enclosure's final CAD model is in orthographic and exploded perspective views.

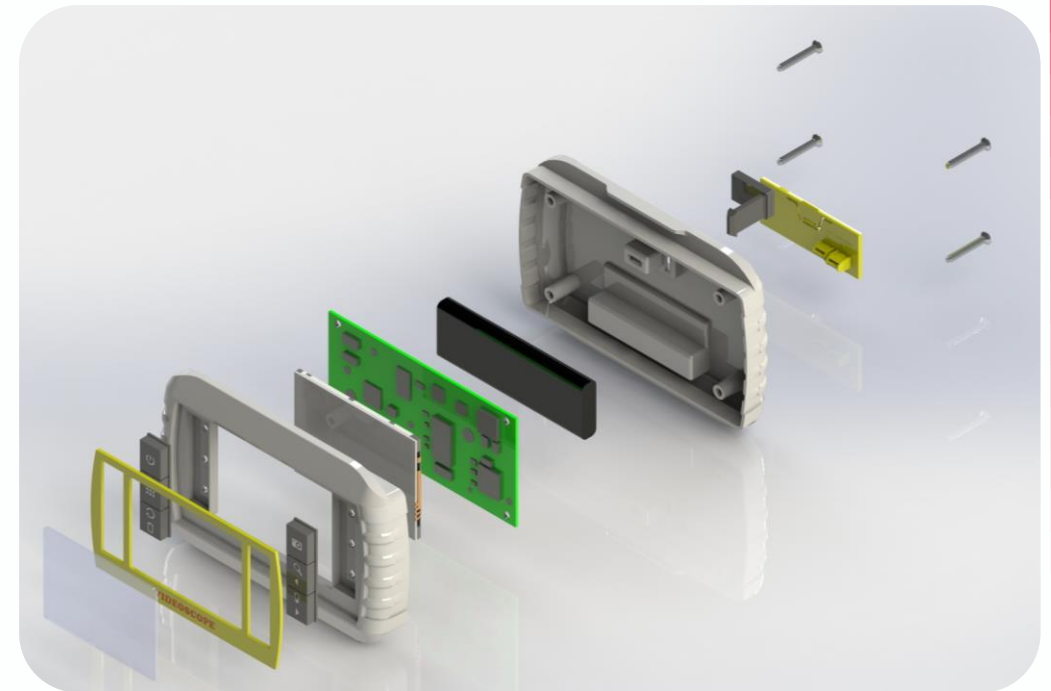
Top View



Isometric View



Exploded View



Front View



Side View



We are delighted to share a testimonial from the satisfied client,

“We are extremely pleased with the 3D enclosure design services provided. The design exceeded our expectations, perfectly aligning with our specifications and demonstrating exceptional expertise and attention to detail. The project was completed within the specified timeline, showcasing their impressive efficiency and reliability. Additionally, they optimized the cost of the design without compromising on quality, highlighting a strong dedication to customer satisfaction. We highly recommend their services to any organization seeking top-tier design solutions. Their outstanding performance significantly contributed to the success of our project, and we look forward to future collaborations with such a talented team”



In summary, our team successfully overcame challenges to deliver a meticulously crafted enclosure by leveraging extensive brainstorming sessions and our expertise in MCAD Engineering Services.

Through careful analysis and precise execution, we provided a design that exceeded client expectations, optimizing every aspect for superior performance.

Our collaborative approach went beyond technical aspects, refining the design to meet the client's specific requirements while ensuring cost-effectiveness and timely delivery.

We are dedicated to providing unparalleled MCAD services, showcasing our expertise and reliability in achieving exceptional results.

