Engineering Design Solutions and Precision Manufacturing

MechCurve
ENGINEERING SOLUTIONS

"MechCurve Engineering Solutions" is a design-focused engineering company providing CAD modeling, simulation, and product development services. We help turn ideas into practical, manufacturable solutions with precision and efficiency.

Our Services

- Design Services
  - 3D CAD Modeling
  - Product Design & Development (CAE)
  - Engineering Drawings
- Manufacturing Support
  - CNC / VMC / EDM Wirecut
  - Heat Treatment
  - Prototype to Production Support
- 3D Printing
  - FDM Printing
  - Metal 3D Printing
  - Rapid Prototyping

Our Process

1: In-Depth Requirement Analysis & Consultation.

2: Innovative Concept Design & Development.

3: High-Precision CAD Modeling & Engineering.

4: Advanced Simulation & Performance Validation.

5: Manufacturing-Ready Design & Technical Documentation.

6: Continuous Support & Design Optimization.

Our Work

Project Name:

Industrial Mounting Plate – Design, Manufacturing & Heat Treatment (Bulk Production)

Overview:

This project involved the complete development of an industrial mounting plate, from CAD design in SolidWorks to CNC machining and final heat treatment for improved hardness. The objective was to deliver a precise, durable, and production-ready component suitable for industrial applications.

Problem Statement:

The client required a high-precision mounting plate with accurate hole positioning and proper fitment for assembly. Additionally, the component needed higher surface hardness (HRC) to improve wear resistance and durability during operation.

Solution Provided:

A detailed 3D CAD model was developed in SolidWorks with proper dimensions and tolerances. The design was optimized for CNC machining to ensure efficient production. After machining, heat treatment was carried out to increase hardness (HRC up to 40 to 50 around), enhancing strength. Final drawings and specifications were provided for smooth production.

Key Features:

- High dimensional accuracy
- CNC machining optimized design
- Increased hardness (HRC) for durability
- Easy assembly fitment

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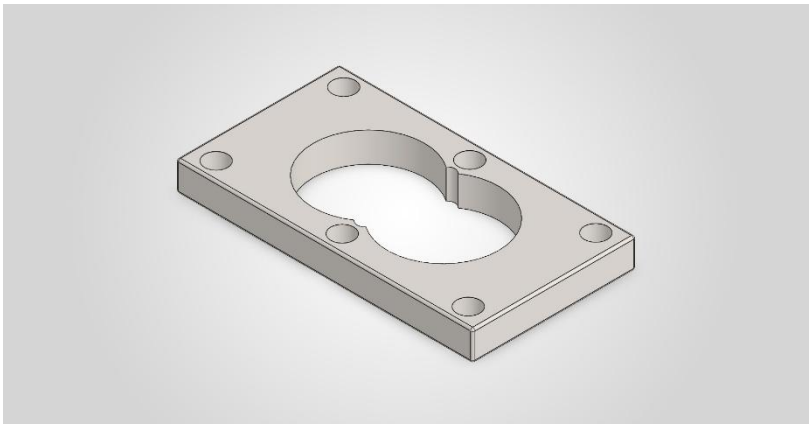
Tools & Software Used:

- SolidWorks (3D Modeling & Drawings)
- CNC Machining
- Heat Treatment Process

Images:



Project Outcome:

Successfully delivered bulk production components with improved hardness and consistent quality. The final product achieved better strength, wear resistance, and reliable performance in industrial use.

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Project Name:

Motor Vibrating Pad – Design & CNC Machining (Bulk Production)

Overview:

This project involved the design and manufacturing of vibrating pads for industrial motors. Based on the client-provided drawing and requirements, the component was designed in CAD and then manufactured using CNC (VMC) machining. A total of 120 units were produced with high precision and consistency.

Problem Statement:

The client required vibrating pads with accurate hole positioning and dimensions as per their motor specifications. The components needed to ensure proper fitment and effective vibration reduction during operation.

Solution Provided:

The design was developed based on the client's drawing and requirements, ensuring all dimensions and hole placements were accurate. The finalized CAD model was then used for CNC machining (VMC), enabling precise drilling and consistent production of all components.

Key Features:

- Designed as per client-provided drawing
- Precision drilling and accurate hole positioning
- High dimensional accuracy
- Consistent quality in bulk production
- Reliable fitment for motor assembly

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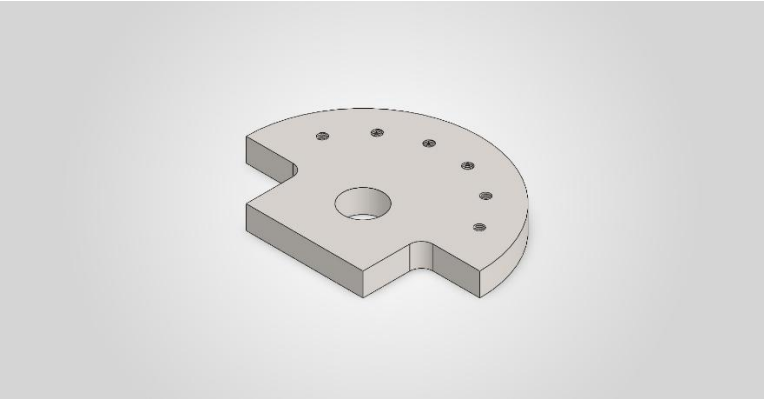
Manufacturing Details

- Process: CAD Design + CNC Machining (VMC)
- Quantity: 120 Units (Bulk Production)
- Material: Mild Steel
- Operations: CAD Modeling, Drilling, Profiling, Finishing

Images:



Project Outcome:

Successfully designed and manufactured 120 vibrating pads with precise dimensions and consistent quality, ensuring proper fitment and effective vibration reduction in motor applications

Project Name:

Reverse Engineering of Merto Brake Assembly – CAD Design, Assembly & BOM

Overview:

This project involved the reverse engineering of a Merto brake assembly, where the complete system was digitally recreated using CAD. Individual components were designed, assembled, and documented, along with proper material selection and a complete Bill of Materials (BOM) for engineering reference.

Problem Statement:

The client required a complete digital model of an existing brake assembly without detailed design data. The task included accurate component design, assembly creation, and proper documentation for engineering and reference purposes

Solution Provided:

The brake assembly was analyzed and divided into individual components. Each part was designed in SolidWorks with accurate dimensions and geometry. Appropriate materials were assigned based on functional requirements (steel, spring steel, insulation materials, etc.).

The final assembly was created with proper constraints and alignment. Additionally, STEP files for all components and the complete assembly were provided, along with a detailed Bill of Materials (BOM) for documentation and future use.

Key Features:

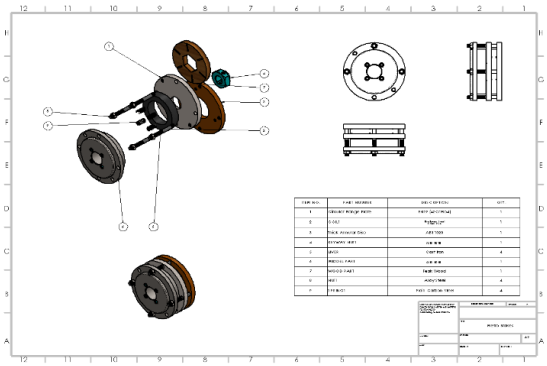
- Complete reverse engineering of brake assembly
- Accurate design of individual components
- Proper assembly creation with correct fitment
- Material selection based on functionality

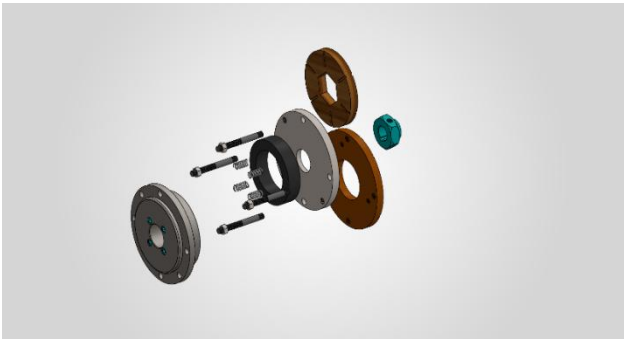
- STEP files provided for all parts and assembly
- Detailed BOM (Bill of Materials) documentation

Deliverables

- 3D CAD Models (All Parts).
- Complete Assembly File.
- STEP Files (.step) for each component and assembly.
- Bill of Materials (BOM).

Images:





Project Outcome:

Successfully delivered a complete reverse-engineered CAD assembly with all components, STEP files, and BOM, enabling accurate digital representation and future engineering applications.

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Project Name:

Snap-Fit Enclosure Design & Rapid Production for Electrical Circuit Housing

Overview:

Design and development of a two-part snap-fit enclosure for secure housing of an electrical circuit, followed by rapid production of 200 units per part using 3D printing within a 3-day turnaround

Problem Statement:

The client required a compact and reliable enclosure to house their electrical circuit with the following constraints:

- Tool-less assembly (no screws or fasteners)
- Secure locking mechanism to prevent accidental opening
- Fast production timeline for initial deployment

Solution Provided:

A two-part enclosure was designed with an integrated snap-fit mechanism ensuring easy assembly and disassembly while maintaining structural integrity. The geometry was optimized for additive manufacturing, minimizing print time and material usage.

Key Features:

- Engineered snap-fit joints for repeatable locking performance
- Uniform wall thickness for strength and manufacturability
- Optimized internal space for circuit placement and protection
- Draft-friendly design for potential mold conversion
- Rapid prototyping and batch production capability

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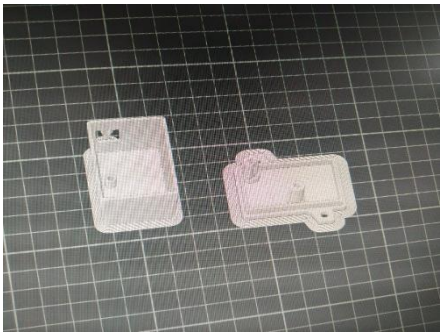
Tools & Software Used:

- CAD: SolidWorks
- Design Approach: DFM (Design for Manufacturing) & DFA (Design for Assembly)
- Manufacturing: FDM 3D Printing

Images:



Project Outcome:

- Delivered **200 units per part** within **3 days**
- Achieved **~28 minutes print time per part**
- Manufactured using **PLA material**
- Maintained **low rejection/failure rate during production**
- Enabled fast client-side assembly without additional hardware

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Why Choose Us

- **End-to-end support:** concept → DFM → prototyping → manufacturing handover
- **Designs built for manufacturing** (not just CAD): reduced rework and faster tooling
- **Fast turnaround**: typical design-to-prototype cycles within defined timelines
- **Cost-focused engineering:** optimized designs to reduce material and production cost
- Strong in plastics & injection moulding domain
- **Clear communication** with **regular updates** and technical transparency.

Contact

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