Phani Raju Nuvvula Mechanical Design Engineer

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Summary

Mechanical Design Engineer with 3+ years of experience in product design, structural analysis, and fixture development across aerospace and manufacturing industries. Skilled in CAD modeling, finite element analysis, and design for manufacturability. Proficient with tools like CATIA V5, SolidWorks, CREO, ANSYS, Abaqus, and MSC Nastran. Adept at collaborating with cross-functional teams to optimize product performance, ensure compliance with industry standards, and improve production efficiency.

Technical Skills

- **CAD & Modeling**: CATIA V5, SolidWorks, CREO, Unigraphics NX
- **FEA & Industry Standards**: ANSYS Mechanical, Abaqus, MSC Nastran, FAA Compliance, ASME Y14.5, Honeywell & Internal Quality Standards
- **Design & Manufacturing**: GD&T, Design for Manufacturability (DFM), ISO 9001 Standards
- **Simulation & Testing**: Thermal, Structural, Vibration, Fatigue Analysis, Modal & Transient Dynamics
- **Project & Data Management**: Teamcenter PLM, SolidWorks PDM, ECO Management
- **Software & Tools**: MS Office Suite, 3D Printing (FDM), STEP/STL File Handling

Professional Experience

Mechanical Design Engineer, Honeywell Aerospace — 10/2024 – Present | Arizona, USA

- Worked on Advanced Lightweight Composite Structural Panel Expansion focusing on the Honeywell Hexcel M21/T700 aerospace-grade panel to cut aircraft structural weight by 15% team up with materials scientists, design, and manufacturing teams in detailed requirement-gathering sessions.
- Utilized CATIA V5 for complex surface and structural modeling of composite panels and SolidWorks for designing detailed fixtures and assembly components. Applied classical laminate theory and performed mechanical strength and fatigue life prediction using MSC Nastran software.
- Designed critical features including ply drop-offs, stiffener reinforcements, and integrated sensor mounts ensuring manufacturability and compliance with FAA and internal Honeywell standards using Design for Manufacturability (DFM) best practices.
- Performed advanced Finite Element Analysis (FEA) using ANSYS Mechanical and Abaqus to evaluate static stress, vibration, and thermal loads. Led modal and transient dynamic simulations with applying time-domain and frequency-domain methods to optimize panel durability by 20%.
- Executed mechanical testing protocols including tensile, compression, vibration, and fatigue tests in collaboration with the Honeywell Materials Testing Lab. Analyzed test data using statistical tools and updated the panel design to improve performance and reliability.
- Authored comprehensive technical reports and validation documents using MS Office Suite and the Teamcenter PLM system. Presented findings to cross-functional teams and collaborated with manufacturing engineering to finalize AFP processes for optimized layup sequence production.

Mechanical Design Engineer – Fixture Development (SCPP), BIHER — 12/2021 – 07/2023 | Chennai, India

- Designed pressure collector assemblies and thermocouple bracket fixtures using SolidWorks and applied GD&T for alignment and clearance, validating component interfaces via test installs and 3D printed mockups for accurate physical simulation.
- Analyzed tolerance stack-up failures using engineering drawings and 2D overlays, proposed precise adjustments in slot length and hole offsets, resolving thermal duct interference and increasing assembly precision by 40%.
- Generated ISO 9001-compliant 2D drawings with detailed title blocks, tolerances, and revision control, using SolidWorks PDM for managing Engineering Change Orders (ECOs) and maintaining full design traceability and lifecycle accuracy.
- Conducted thermal and structural feasibility analysis on fixture concepts using ANSYS and manually validated constraints through functional fit testing, ensuring safety and usability under varying load and temperature conditions.
- Collaborated with quality assurance inspectors, production engineers, and lab technicians to resolve non-conformance reports and integrated dimensional feedback into three iterative design revisions, minimizing rework rates by 35%.
- Led fixture design reviews with cross-functional teams including field engineers, manufacturing leads, and CAD technicians to clarify tolerancing, improve install workflows, and reduce field install errors by over 80%.

Associate Mechanical Design Engineer, Husky Technologies — 01/2021 – 12/2021 | Chennai, India

- Assisted in the Design and Optimization of Hot Runner Systems to enhance thermal efficiency and uniformity in injection molding by 25% through detailed requirement-gathering sessions and close collaboration with R&D, tooling, and process engineering teams.
- Modeled hot runner manifolds and nozzles using Unigraphix-NX and CREO, applying thermal distribution simulations to ensure consistent heat flow across all cavities which improved cycle time performance by 18%.
- Designed valve gate components and nozzle tips in CREO and validated them using functional testing and high-temperature trials which resulted in a 30% improvement in wear resistance and operational lifespan.
- Collaborated with quality, manufacturing, and simulation teams to conduct Design for Manufacturability (DFM) reviews and performed thermal and stress analysis in ANSYS that reduced production rework rates by 22%.

Education

Master of Science in Mechanical Engineering — 08/2023 – 05/2025
Arizona State University — **Tempe, AZ, USA**

Bachelor of Technology in Aerospace Engineering — 07/2018 – 05/2022
Bharath Institute of Higher Education & Research — **Chennai, India**

Projects

HVAC Bracket System – GD&T Design & Drawing Control

- Designed airflow frames, brackets, and fastener plates in SolidWorks with ASME Y14.5-compliant dimensioning; conducted tolerance stack-ups to ensure duct and fastener alignment in test builds.
- Delivered PDM-controlled 2D drawings, install guides, and BOMs; led supplier reviews and managed ECOs, achieving 100% on-time prototype release and eliminating build misinterpretations.

Aircraft Subsystem Fixtures – Tolerance Closure & Fit Validation

- Modeled precision jigs and brackets with GD&T control of true position and surface profiles; executed closed-loop tolerance analysis to refine alignment and adjust fit class.
- Addressed machining issues via supplier feedback, redline revisions, and thread correction; presented alignment strategy and received full team approval for fixture pilot run.

3D Print Frame Design – DFM for Additive Prototyping & Fitment

- Designed FDM-compatible modular chassis using SolidWorks with optimized print geometry; collaborated with vendors using STEP/STL files and added ribs to cut print failure rate by 60%.
- Shaped a full installation guide with exploded views, labeled diagrams, and PDF doc, supporting efficient assembly by a 10+ expert lab team.