Ashwin Sudarshan

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Summary

Mechanical engineer focused on design, reliability, and manufacturability, with achievements including 35% faster burner changeouts at Novelis ($30K/yr), gear pump end-cover redesign at Bosch, saving $0.25/unit and validated by ABAQUS FEA, and JEDEC-style accelerated testing at UMD CALCE, skilled in 3D CAD, FEA, Python, and Power BI.

Education

University of Maryland — College Park, MD
Master of Science in Mechanical Engineering, GPA 3.7 — *Aug. 2023 – May 2025*

RV College of Engineering — Bangalore, India
Bachelor's in Mechanical Engineering — *Aug. 2018 – Aug. 2022*

Technical Skills

CAD: Creo, SolidWorks, CATIA V5, Inventor, AutoCAD, GD&T
FEA: ANSYS, ABAQUS, thermal/structural FEA
Test & Failure Analysis: Thermal cycling, HAST, mechanical shock; SEM/EDS, real-time continuity monitoring
Data & Automation: Python (automation, data handling), MATLAB/Simulink, Power BI, Microsoft Excel, Machine Learning, Artificial Intelligence
Quality & Manufacturing: DFM/DFA, FMEA, SPC, Gauge R&R, Lean/Six Sigma, Root cause analysis
Certifications: Six Sigma Black Belt, Agile(Atlassian), Bosch-certified in 8D

Work Experience

Mechanical Engineer (Research Assistant) — Feb. 2025 – present
University of Maryland — *College Park, MD*

- Selected and specified daisy-chain dummy dies with the supplier and mapped pad nets; decided on wedge bonding and defined pad breakout to the PCB, enabling reliable continuity monitoring on the test boards.
- Defined the FR-4 test board architecture and materials, including a six to eight layer stack, daisy-chain routing, test points, and encapsulant thickness targets, creating a consistent baseline to compare package-level failure modes.
- Built the accelerated-test plan and data acquisition setup with an Agilent 34970A data logger, using JEDEC standards to set thermal cycling from 40 to 125 °C (10-minute dwells, under 20 °C/min, up to 1,000 cycles), HAST at 110 °C and 85% RH for 264 hours, and 1,500 g shock; defined failure as an open or a 20 percent resistance rise.

Mechanical Engineering Intern — Jun. 2024 – Aug. 2024
Novelis — *Oswego, NY*

- Re-engineered burner changeout system in Autodesk Inventor, validated in field trials; cut maintenance time by 35%, saved 150 tech-hours/year, and projected $30K/year cost savings.
- Performed volumetric studies on three industrial furnaces and recalibrated radar-level sensors, preventing four overfill incidents/year
- Standardized new burner setup procedures with zero safety incidents during adoption.

Mechanical Design Engineer — Apr. 2022 – Jul. 2023
Bosch — *Bangalore, India*

- Redesigned the external gear-pump end cover in Creo, removing non-critical material while preserving stiffness, which reduced part mass and cut material cost by about $0.25 per unit.
- Validated the redesigned cover with an Abaqus model using 230–280 bar internal pressure, 26 kN M12 bolt pretension, and housing/bushing contacts; after mesh refinement varying from 33k to 576k elements, the maximum principal stress at the joint converged to 243–247 MPa at 280 bar with stable deformation.
- A 400-bar burst test matched the model, with crack initiating at the predicted hotspot and propagating perpendicular to the principal-stress direction, leading to the adoption of the converged, validated model as the design baseline.
- Developed Power BI dashboards tracking 45 quality metrics across APAC; identified three high-impact failure modes, helping cut defect rates by up to 15%.
- Coordinated with 15 suppliers quarterly to reinforce design/quality standards, reducing delays by 8% and compliance issues by 35%.