Max Kuchen

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OBJECTIVE

Mechanical Engineering sophomore with hands-on experience in composite manufacturing, CNC machining, and mechanical system design. Strong background in carbon fiber structures, fabrication-driven design, and applied analysis through independent engineering projects and team-based work.

EDUCATION

University of Colorado Boulder - BS, *Mechanical Engineering* Expected June 2028

Minor: Business | **International Experience**: Sevilla, Spain study abroad

SKILLS

Test & Analysis

ASTM D7264 testing methodology, load-displacement analysis, margin of safety (MoS), strain-based structural analysis, failure mode evaluation, test procedure development, data reduction (Excel)

Design & CAD

Onshape, SolidWorks (beginning), engineering drawings, requirements-driven design, DFM, load case development, FEA/CFD (SimScale)

Manufacturing & Integration

Carbon fiber wet layup & vacuum bagging, composite tooling design, CNC & manual machining, MIG welding, mechanical assembly, calipers, multimeters, shop safety

Programming & Data

Python (in progress), MATLAB (beginning), C++

ENGINEERING PROJECTS

Composite Coupon Testing & Process Validation: Design, Manufacturing & Analysis **| Ongoing**

- Designed and executed an ASTM D7264-based experimental test program to quantify laminate flexural stiffness and failure behavior
- Developed a custom adjustable-span 3-point bend test fixture to ensure repeatable loading conditions
- Established standardized measurement procedures and data-reduction workflow to compute flexural stress and modulus
- Documented testing methodology and ensured consistency across laminate configurations
- Evaluating structural performance tradeoffs across multiple stacking sequences

Carbon Fiber Composite Lifting Surface: Design, Structural Analysis & Manufacturing **| September 2025**

- Designed, manufactured, and structurally validated a 64-in composite lifting surface to meet defined aerodynamic and load requirements
- Developed CFD-derived load cases and performed strain-based structural analysis to verify 1.266 MoS at 1,450 lb ultimate load
- Predicted >3,200 lb failure load and assessed structural performance margins
- Fabricated tooling and executed vacuum bag layup process, maintaining laminate quality and dimensional control
- Reduced total system mass by ~30–50% relative to comparable systems (6.88 lb final mass)

ENGINEERING EXPERIENCE

CU Racing Team | *Endurance Mechanic*

- Diagnose mechanical subsystem failures under race conditions using structured troubleshooting methods
- Perform rapid repair and system readiness checks under time constraints
- Collaborate across mechanical, electrical, and driver groups to improve system reliability

PROFESSIONAL EXPERIENCE

Independent Woodworking & Fabrication | Summer 2025

- Designed and fabricated precision custom panels using wood/resin composites; maintained dimensional and surface-quality tolerances

Rhythm Bikes, Oakland, CA

General Manager | Aug 2023 – Aug 2024

Sales Associate | Jun 2021 – Aug 2023

- Diagnosed and repaired complex mechanical systems using systematic troubleshooting methods
- Generated $240K+ in revenue and managed daily operations in a technical, customer-facing environment