

Abraham Mason

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SUMMARY

Mechanical design engineer with eight years of experience developing complex hardware from concept through prototype, validation, and **production support**. Work combines SolidWorks CAD, GD&T, lightweight structures, composites, finite element analysis, prototyping, manufacturing processes, testing, and quality focused documentation. Engineering efforts have connected design decisions with practical fabrication needs, clear reviews, and reliable product performance. Cross functional collaboration has supported productive work with engineering, manufacturing, suppliers, and **customer groups** while resolving **technical issues** before they affect delivery. A hands on approach brings structure to ambiguous design problems, from early concepts and analysis through test learning and production refinement. This background supports aerospace and **autonomous systems** teams seeking sound mechanical judgment, precise documentation, and dependable execution from initial concept through validated hardware.

EXPERIENCE

Mechanical Design Engineer, Aerospace Hardware

January 2021 - Present

Northstar Flight Systems

Chicago, IL

Lead mechanical design work for aerospace hardware programs, guiding **concept development**, CAD definition, analysis, design reviews, prototype testing, validation, and production support. Partner with manufacturing and customer teams on practical solutions that protect performance, quality, and delivery.

- Created SolidWorks assemblies for lightweight **aerospace** structures, reducing rework during prototype fabrication.
- Applied GD&T during **design reviews**, improving drawing clarity for machining and composite fabrication partners.
- Used FEA findings to refine brackets and housings before physical testing and production release.
- Coordinated **validation** testing with **manufacturing** engineers, resolving fit issues before customer demonstrations.
- Documented design decisions and corrective actions, giving **cross functional** teams a clear release path.

Mechanical Design Engineer, Autonomous Platforms

June 2018 - December 2020

Prairie Robotics Group

Evanston, IL

Developed mechanical components for autonomous platforms from early concepts through prototypes and manufacturing handoff. Balanced structural performance, serviceability, testing needs, and supplier capabilities while supporting technical decisions across engineering and operations.

- Modeled autonomous vehicle enclosures in **SolidWorks**, improving access for assembly and field service teams.
- Evaluated composite and machined concepts with **FEA**, guiding material choices during prototype development.
- Prepared **engineering** drawings with **GD&T**, reducing clarification cycles during supplier quotation reviews.
- Built prototype test fixtures that exposed vibration concerns before platform integration testing.
- Resolved customer fit questions through focused **design reviews** and documented engineering changes.

Mechanical Design Engineer, Product Development

August 2016 - May 2018

Lakeshore Engineering Works

Chicago, IL

Supported mechanical product development across CAD modeling, prototype construction, manufacturing coordination, testing, and **engineering documentation**. Worked with senior engineers and shop partners to convert practical design requirements into manufacturable hardware.

- Converted early product concepts into SolidWorks parts and assemblies for review with senior engineers.
- Supported prototype builds by checking dimensions, fit, materials, and manufacturing constraints at each stage.
- Applied basic FEA and hand calculations to screen structural concepts before detailed testing.
- Recorded test observations and design changes, strengthening traceability across development iterations.
- Worked with machinists and fabricators to resolve production issues without losing design intent.

PROJECTS

Lightweight Composite Flight Structure 📅 2024

Explored how thoughtful weight reduction can improve aerospace performance without sacrificing serviceability. Developed a concept using composite panels, SolidWorks modeling, GD&T planning, and FEA review, with emphasis on clear validation steps and practical manufacturing communication.

Autonomous Sensor Housing Validation 📅 2023

Focused on protecting sensing hardware so autonomous systems can perform reliably in demanding environments. Created a housing concept, reviewed interfaces, planned prototype testing, and documented design decisions for cross functional engineering discussion.

LEADERSHIP & AWARDS

- Received peer recognition for resolving a late prototype fit issue before customer validation testing.
- Selected by engineering leadership to present practical GD&T guidance during cross functional design reviews.
- Commended for clear production documentation that helped manufacturing teams act without repeated clarification.

EDUCATION

Bachelor's Degree in Mechanical Engineering
Midwest Technical University GPA: 3.7
Coursework: Computer Aided Design, Finite Element Analysis, Manufacturing Processes, Materials Science, Engineering Mechanics

2016
Evanston, IL

CERTIFICATIONS

- SolidWorks Associate Certification 📅 2018
- GD&T Fundamentals Certificate 📅 2019

TECHNICAL SKILLS

- **CAD Design:** SolidWorks, 3D assemblies, engineering drawings
- **Geometric Dimensioning:** GD&T, tolerance analysis, datum schemes
- **Mechanical Analysis:** FEA, hand calculations, structural review
- **Aerospace Structures:** Lightweight structures, composites, flight hardware
- **Manufacturing Processes:** Machining, composite fabrication, prototyping
- **Product Development:** Concept development, design reviews, production release
- **Testing Practices:** Prototype testing, validation testing, test fixtures
- **Quality Systems:** Quality processes, corrective actions, traceability
- **Engineering Documentation:** Design records, technical drawings, change documentation
- **Cross Functional Delivery:** Manufacturing coordination, customer reviews, issue resolution

SKILLS

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|---------------------|-----------------|----------------------|-----------------------------|
| • Mechanical design | • Composites | • Design reviews | • Technical documentation |
| • CAD | • FEA | • Validation testing | • Cross functional teamwork |
| • GD&T | • Prototyping | • Production support | • Customer collaboration |
| • Aerospace systems | • Manufacturing | • Quality processes | |

PROFESSIONAL AFFILIATIONS

- Member, American Society of Mechanical Engineers, with interest in practical mechanical design standards.
- Participant, Society of Automotive Engineers technical community, focused on aerospace and autonomous systems.

LANGUAGES

- English (Native)
- Spanish (Intermediate)

ADDITIONAL INFORMATION

Work Status : Authorized to work in United States. No sponsorship required.

REFERENCES

AVAILABLE ON REQUEST