

DAPR Engineering LLC

Working with DAPR

Why DAPR?



- Our team is composed of highly talented and versatile mechanical, electrical, software, controls, application engineers and designers that have decades of experience spanning across many industries.
- Our core team has been working together for over a decade, allowing for a high level of efficiency.
- We have partnered with DMC on multiple projects with great success and outcome.
- We tailor our solutions to support our Client's biggest challenges, including managing complex supply chains, increasing competitive advantage and improving customer loyalty.
- We are dedicated to achieving the highest level of customer satisfaction – it starts with taking the time to fully understand the problem upfront, during the Discovery Phase.
- We are an Engineering service team – we focus on core engineering principles and deliver robust solutions.
- We operate as an extension of YOUR team – we are here to work with you so that we are successful together.

What Our Customers and Suppliers are saying



To Whom It May Concern,

For the past number of years I have worked , as a vendor, with DAPR on a variety of projects involving multiple products. These have varied in complexity and components used. We mutually developed enclosure that we either fully or partially assembled. In addition we also provided Pneumatic, I/O, RFID and Electro-Mechanical components. At one given time we had 6 various project that were in one stage or the other which required a great deal of coordination. All of these went smooth. We were provided with excellent documentation along with solid designs. I found the DAPR personnel to be very knowledgeable and easy to work with. If I needed any information it was provided on a timely basis. They also required Engineering Reviews so we could make certain that the requirements were being met and on time.

I found all of the staff to be extremely easy and enjoyable to work with. I have no problem, in fact I already do, recommending DAPR to clients that can benefit from their services.

I found that DAPR has high expectations of their suppliers which allows them to offer the quality service that I have seen.

George Veves

NEFF | Key Account Manager

DAPR has been the ideal engineering partner for Antora Energy. Their deep expertise, attention to detail, crystal-clear communication, and passion for developing effective and robust solutions to exceedingly difficult problems makes them a world-class organization. DAPR has helped bring our technology from bench-scale demonstrations to engineering-scale prototypes, and will continue to help us scale to pilot systems.

David Bierman

Co-Found Antora Energy

What Our Customers and Suppliers are saying



As the Vice-President of IAS, an Industrial automation supplier who has been working with DAPR for over 5 years, I have respected the professional relationship our organizations have formed. The level of effort and engineering awareness they present to every project is unparalleled. We have worked closely with DAPR as not only a supplier of components, but have also worked closely with them on building control cabinets of their design. The documentation and communication allows for a high level of success in our engagement which results in a win for their customers. From the owners to the engineers, the team dynamics and dedication are easy to see in every project they undertake. We have been and continue to be a big supporter of this team, and look forward to years of continued success. The entire team here at IAS is proud of being considered a valued partner with DAPR and I feel very confident in recommending their services to anyone in need of engineering services.

Erin N. Brady
Vice President
Industrial Automation Supply, Inc.
800.736.2345
Mobile 207.899.8228

I have been working with DAPR for almost 6 yrs, and also with many of their engineers prior to DAPR being formed. DAPR has always been a very responsive customer for Wesco, with great communication of the final needs of their customer. They have a great sense and understanding of equipment design and the industrial machine space in general. They are very well respected in the industry and I would not hesitate to refer them to anyone with a challenging engineering opportunity. They are a dedicated team with their customers best interests in mind. Overall, they are a great group and I have enjoyed working with them over the years.

Thank you.

Jim Cavanaugh
Senior Account Manager
603-289-9636

Project Approach

DAPR will use a phased approach in managing this project, providing gates that the project must pass through with agreement from the client, providing the engagement necessary to move the project forward at key milestones. A dedicated Project Manager will be assigned for the life of the project. Each project is tailored to meet specific project deliverables but follows this process in some manner.

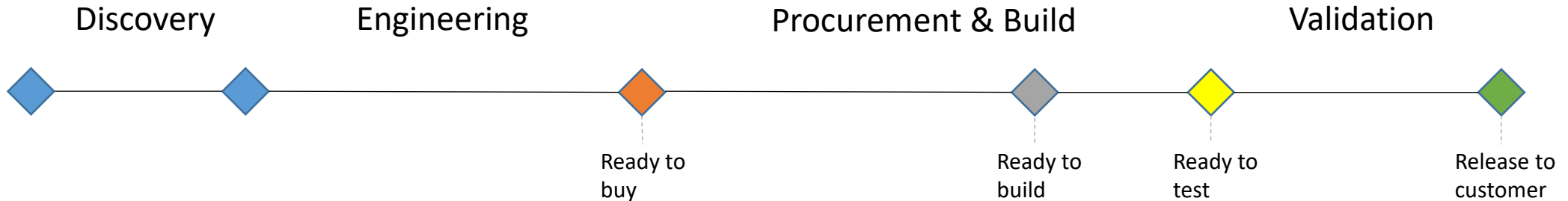
Phase 0 -- Discovery

Phase 1 -- Engineering

Phase 2 -- Procurement & Build

Phase 3 -- Validation

- *Dedicated PM - weekly team updates*
- *Scheduled design reviews/gates*
- *Detailed Project Plan – schedule & budget*
- *Key Success Criteria*
- *Top Issues/Risks & Mitigation Plan*
- *Action Item Tracker*



Project Phases & Deliverables

This project's main risk is "TIME to COMPLETION". In order to strive towards success, the stages will be run in a more parallel manner. In Discovery, a large effort will be to identify OTS (off the shelf) technologies that can be applied in the time allowed.

Phase 0 - Discovery

Further work will be put into refining the system layout. DAPR will engage with critical component suppliers and work with the client to fully define the system requirements.

Deliverables:

- Refined system layout
- System Behavior Document (first draft)
- Detailed Project Plan
- Revised Statement of Work (if applicable)
- [Project-specific deliverables will be defined later]

Phase 1 – Engineering

All engineering and design tasks needed to meet the system requirements will be completed, including system design, simulation, analysis, etc.

Deliverables:

- Weekly project update meetings
- Design reviews at key milestones
- Control system architecture
- System BOM
- [Project-specific deliverables will be defined later]

Project Phases & Deliverables

It is likely there will be some compromise on validation at DAPR and will have to consider a Phase where we build a large part of this system on site. We will work to define the areas of high risk requiring additional efforts early in the program to drive design decisions

Phase 2 – Procurement & Build

During this phase, parts will be ordered and received. Build and integration will happen at DAPR.

Deliverables:

- Purchase orders placed for all components
- Parts received at DAPR facility
- System build and integration
- Operational testing
- [Project-specific deliverables will be defined later]

Phase 3 – Validation

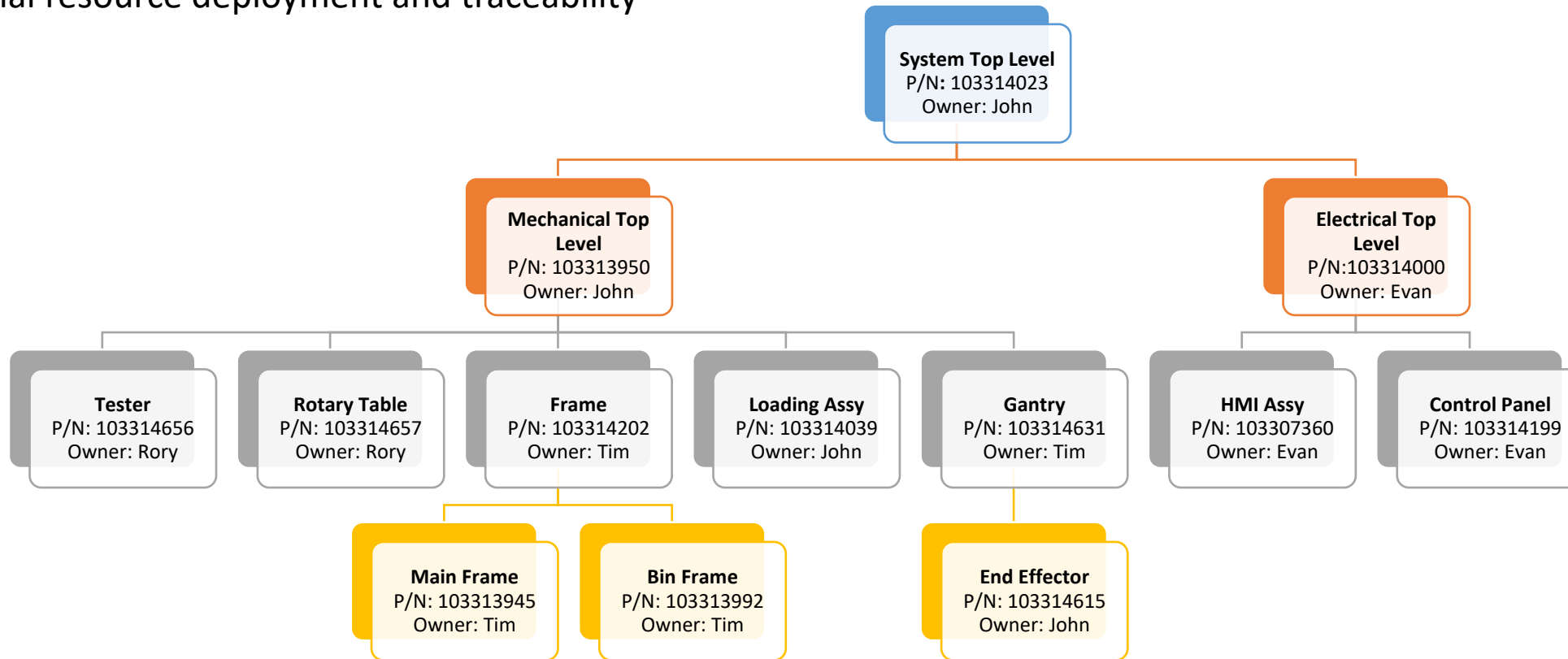
During this phase, FAT will be completed at DAPR and SAT will be completed at the client site. OR equivalent qualification steps will be defined and executed to release product.

Deliverables:

- [Project-specific deliverables will be defined later]

Example – Automation Architecture

Project is broken into 'sub-systems' to allow
for optimal resource deployment and traceability



DAPR Engineering LLC

Company Overview

Mission Statement: DAPR Engineering is committed to providing engineering services dedicated to achieving the highest level of customer satisfaction.

Philosophy: Providing a client with a good design is not the same as providing a client with a solution based on using sound engineering principles to back a creative design approach. Executing analysis and engineering allows for robust designs while minimizing risk, which create greater opportunities for the success of our clients.

Introduction

DAPR Engineering LLC was founded Dec 2014

DAPR Engineering Team – *Over 16 on team comprised of permanent staff and ‘flex’ staff

- 8 Mechanical Engineers and Designers
- 3 Controls / Electrical Engineer
- 1 Project / Program Managers
- 2 Electro/Mechanical Technicians

Flex Staff expandable with various resources as required with minimal lead time within our network – will be able to leverage for this opportunity

Many team members with more than 25 years experience in various industries including:

- Large industrial automation; steel mills, printing presses, battery assembly, high-temp furnaces; expertise in specialty high-temp materials; high vacuum, high pressure applications, textile – web handling, custom vacuum transport
- Custom equipment development, material handling, vision, packaging and assembly
- Extensive experience working with various manufacturing and fabrication processes
- International experience; Asia and European equipment deployment
- Many product releases following international safety and codes; ASME, UL, NFPA, CE, TUV, CCC, etc
- 20,000 square foot facility
- Partnership with DMC
- Extensive supplier network with a multitude of fabrication houses spanning many industries

**NOTE: DAPR was at staff level of 26 prior to Covid – we are able to bring some of team back as opportunities present themselves*

Introduction

DAPR Engineering LLC

Engineering focused

- Define the problem statement
 - High priority is placed on developing a well-vetted and agreed upon statement of work
- Identify risks
 - Early identification, assigning tasks, and mitigation planning for risks is key to staying on track
- Provide custom engineering analysis as opposed to 'design', to support each solution
 - We are not 'if it fits, put it in....' we believe in optimizing the solution with good fundamental engineering, backing up design assumptions with solid engineering principles – using analysis tools as required – 'doing the math' to understand the solution

Well managed with good communication

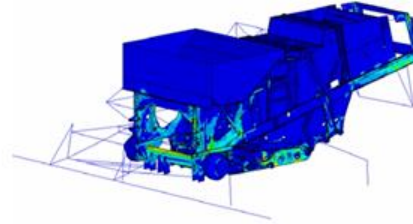
- We follow Program Management philosophy and use tools (e.g. Gantt charts, custom status reports, etc) to convey progress
- Regular and frequent interaction with client

Capabilities

- 3D Modeling
 - Industrial Products, Custom Equipment & Automation Design
 - Concept development
- 2D Layout
- Structural, Thermal Analysis
 - Non-linear structural, Non-linear thermal
 - Mechanical stress/strain modal analysis
 - Basic radiation, thermal capabilities
 - Limited full physics coupling analysis
- CFD (computational fluid dynamics)
 - Allows for radiation, full physics coupling analysis
- Controls Design
- PLC Programming
- HMI development
- Full System Build and Integration
- Support

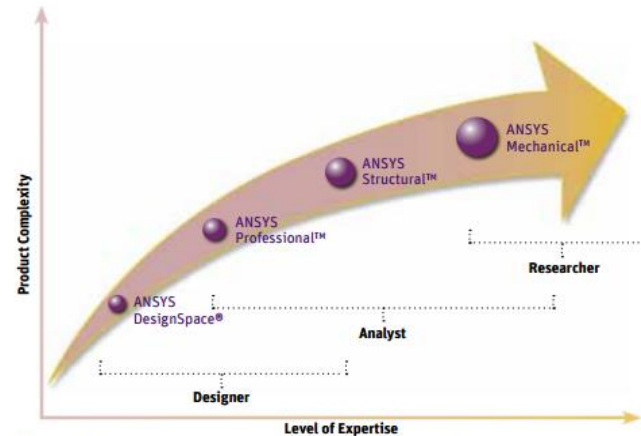
ANSYS Mechanical

ANSYS Mechanical software is a comprehensive FEA analysis (finite element) tool for structural analysis, including linear, nonlinear and dynamic studies. The engineering simulation product provides a complete set of elements behavior, material models and equation solvers for a wide range of mechanical design problems. In addition, ANSYS Mechanical offers thermal analysis and coupled-physics capabilities involving acoustic, piezoelectric, thermal-structural and thermo-electric analysis.



ANSYS Mechanical allows efficient computation of large problems, such as this detailed model of a complete combine.

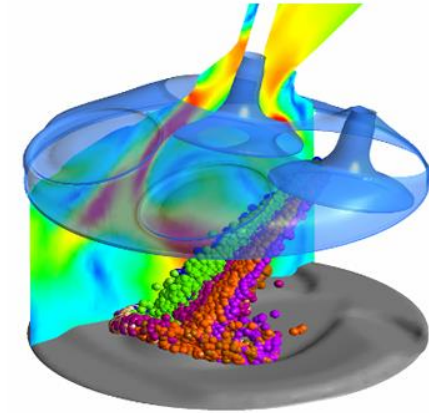
Courtesy CLAAAS.



ANSYS structural mechanics solutions offer a range of products that help users meet current requirements and plan for a seamless upgrade path for future needs. Designers and experts can share common databases while using different product levels.

ANSYS CFX

ANSYS CFX software is a high-performance, general purpose fluid dynamics program that has been applied to solve wide-ranging fluid flow problems for over 20 years. At the heart of ANSYS CFX is its advanced solver technology, the key to achieving reliable and accurate solutions quickly and robustly. The modern, highly parallelized solver is the foundation for an abundant choice of physical models to capture virtually any type of phenomena related to fluid flow. The solver and its many physical models are wrapped in a modern, intuitive, and flexible GUI and user environment, with extensive capabilities for customization and automation using session files, scripting and a powerful expression language.



[View larger image ↗](#)

Automotive in-cylinder flow model with ANSYS CFX Software (Courtesy of BMW)

ANSYS CFX

ANSYS NON-LINEAR MECHANICAL

DAPR has several experienced analysts to help identify and mitigate risks in designs

What DAPR Can Do For You



Our focus is to be YOUR high value engineering partner that can deliver an integrated solution

How we achieve these results:

- Become an extension of your team
- Provide expertise and seek out alternative approaches to problems
- Provide sound engineering practices while leveraging your core knowledge and experiences
- Robust project definition
- Risk identification, mitigation planning
- Staged approach to project layout with clear deliverables
- Program Management – assign a dedicated project manager to your project
- Good communication

Projects



In nearly 6 years, DAPR has worked with over 50 clients spanning more than 15 industries. We pride ourselves in the relationships we build with our customers from the beginning of a project to the end, and beyond. Because of this, our growth has been completely organic, with opportunities coming to us from our network of past clients, machine shops, and several repeat customers.

At our core, DAPR specializes in **Industrial Machine Design**. With this as a baseline, we have been targeted for services in three main project categories:

- **OEM Industrial Product Development**
- **Custom Automation**
- **General Consulting / Analysis**

OEM Industrial Product Development

How We Operate:

- DAPR works as an extension of a client's engineering team to develop the best solution at the target cost. We are capable of proof of concept & prototyping, product design & development, process development, white sheet to production, and pre-production manufacturing
- In short, DAPR can help in all areas from start to finish in: Design, Analysis, Procurement, Building, Testing, and Product Development Road Mapping

Example:

- DAPR worked with an additive manufacturing company on developing multiple products of different printers. We were a complete extension of their engineering team in developing these printers for the market. White sheet to production machines were created in 16 weeks, and alpha machine integration took 20 weeks.



Additional examples can be found in the Appendix of this document.

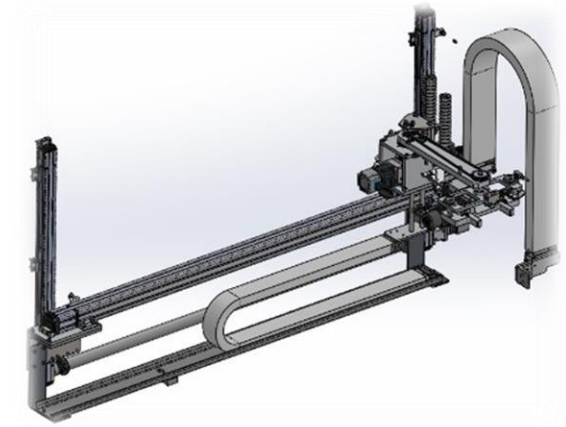
Custom Automation

How We Operate:

- Each customer's challenge is unique, so DAPR strives to be flexible in design, and transparent in our communication with clients to better drive toward the best possible solution.
- DAPR has experience with high speed material conveyance, precision pick & place, test equipment, robotics, vision inspection, linear & rotary assembly operations, and continuous or intermittent motions. We are confident in our ability to solve any challenges you may have.

Example:

- A customer had a need for an automation cell to pick up a piece of material, bring it to a tester, and sort it in bins based on the test result. We were responsible for the entire system (concept development, design, analyze, procure, build, test).



Additional examples can be found in the Appendix of this document.

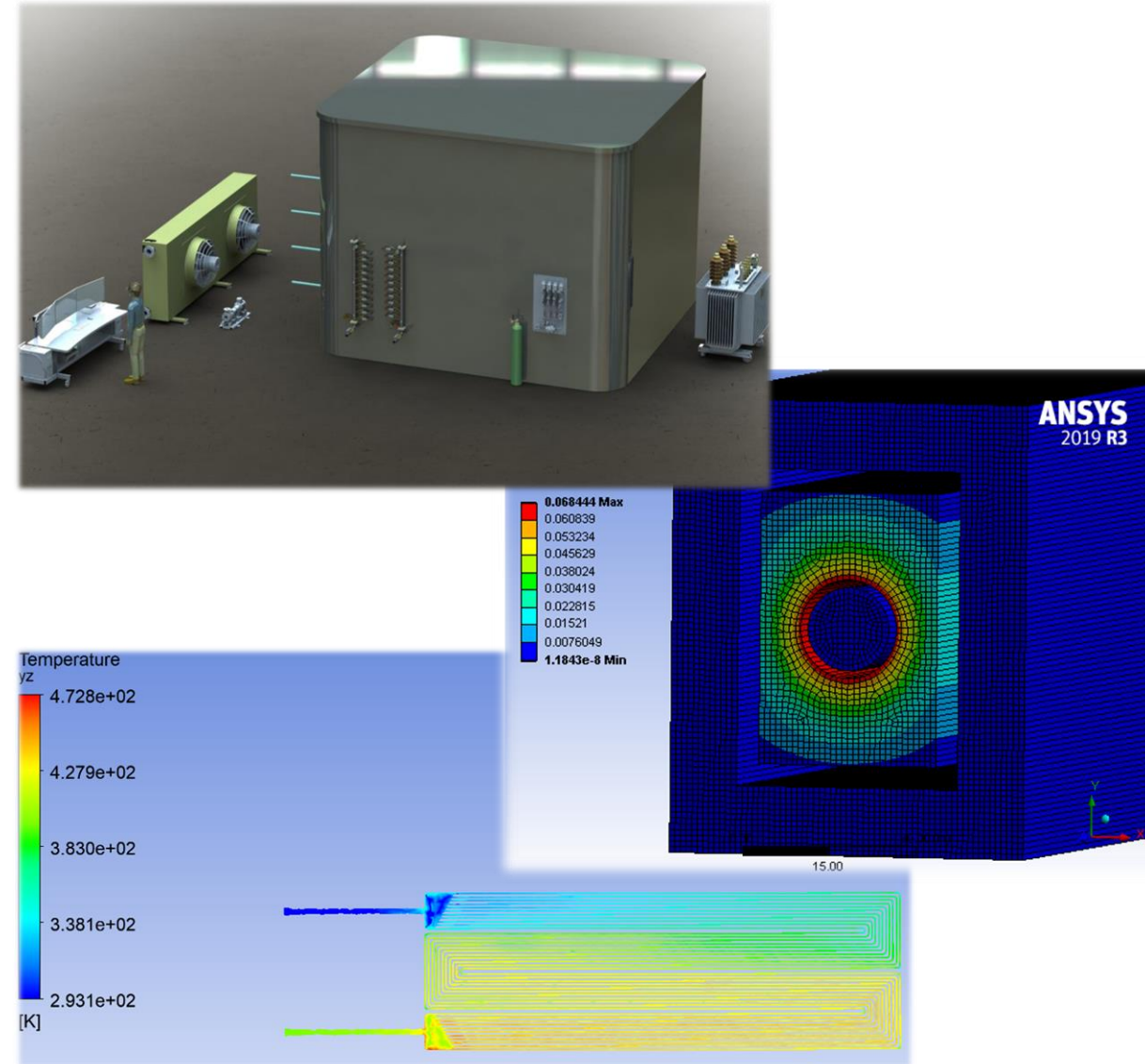
General Consulting & Analysis

How We Operate:

- At DAPR, we use industry leading tools to ensure that our designs are safe, reliable, and up to industry standards. We offer PE services in any state and are licensed in NH & MA.
- In all aspects of design, the engineering behind it must be done. Failures occur when design components are overlooked. DAPR is careful in evaluating our work with the help of tools such as FEA simulations, ANSYS, Mathcad calculations & models, timing studies, risk analysis and mitigation planning, FMEA, Pugh Matrix, and more.

Example:

- DAPR has been working with a thermophotovoltaic startup on a “Discovery Phase” where we are testing client assumptions, identifying risks, building a system cost/efficiency model, running FEA simulations & more. We are now in the process of developing their Alpha system.



Additional examples can be found in the Appendix of this document.

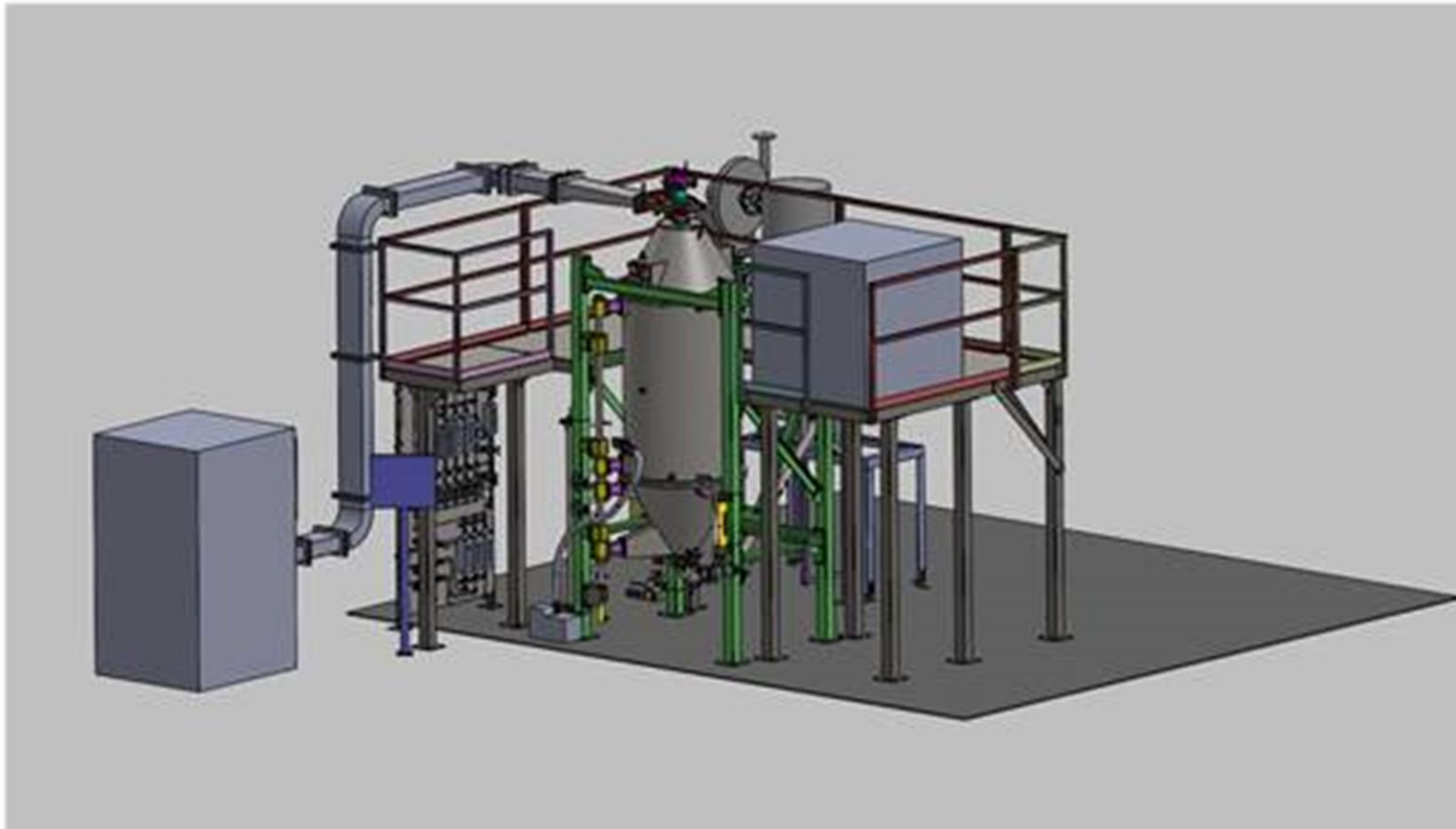
Appendix: Additional Sample Projects

- High Temperature Furnace
- Precision Material Conveyance
- Custom Hydraulic Lift Stacker
- Custom 9-Axis Non-contact Inspection System
- Automated Test Stands
- Gantry Automation Work Cell for Cryogenic Application
- Custom High Precision Lift Devices

Additional Projects

High Temperature Furnace – proprietary plasma equipment for processing materials

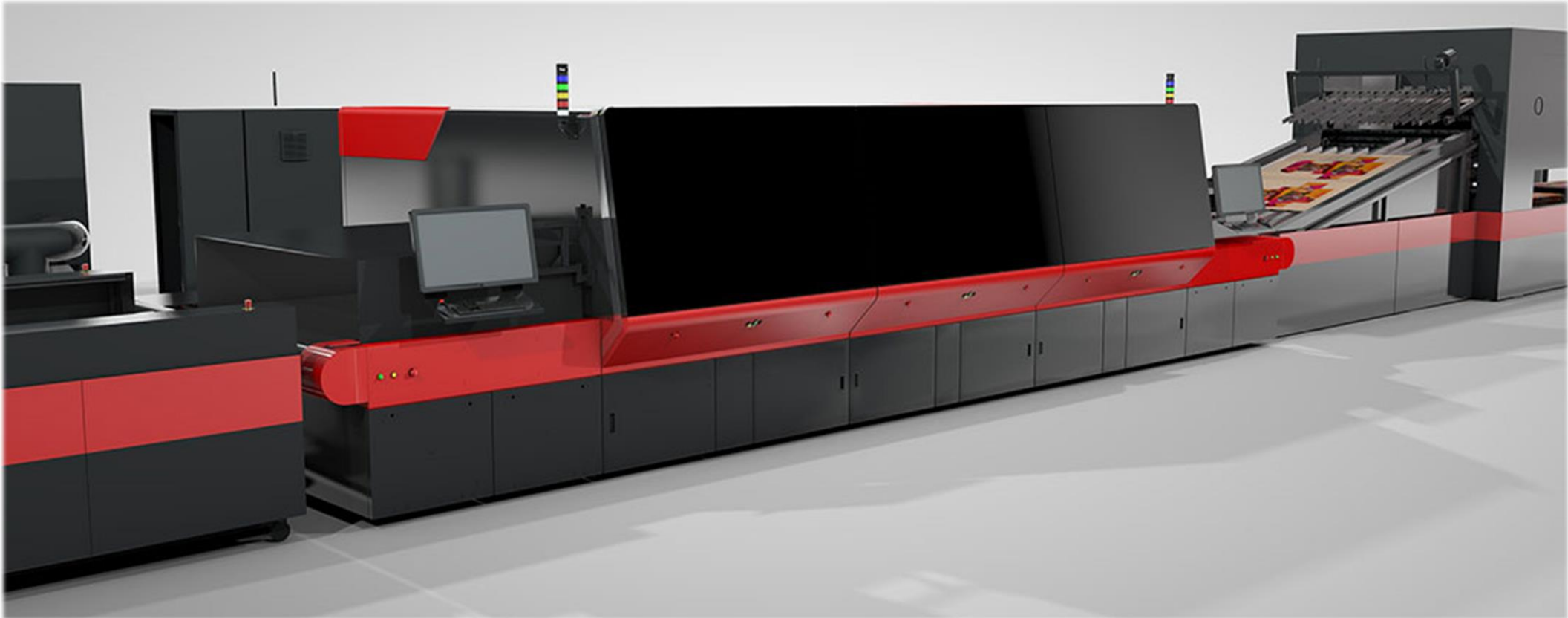
- Design from white paper with limited 'knowns', analysis, sourcing and procurement



Additional Projects

Precision Material Conveyance – develop complete custom machine subsystem for digital print industry

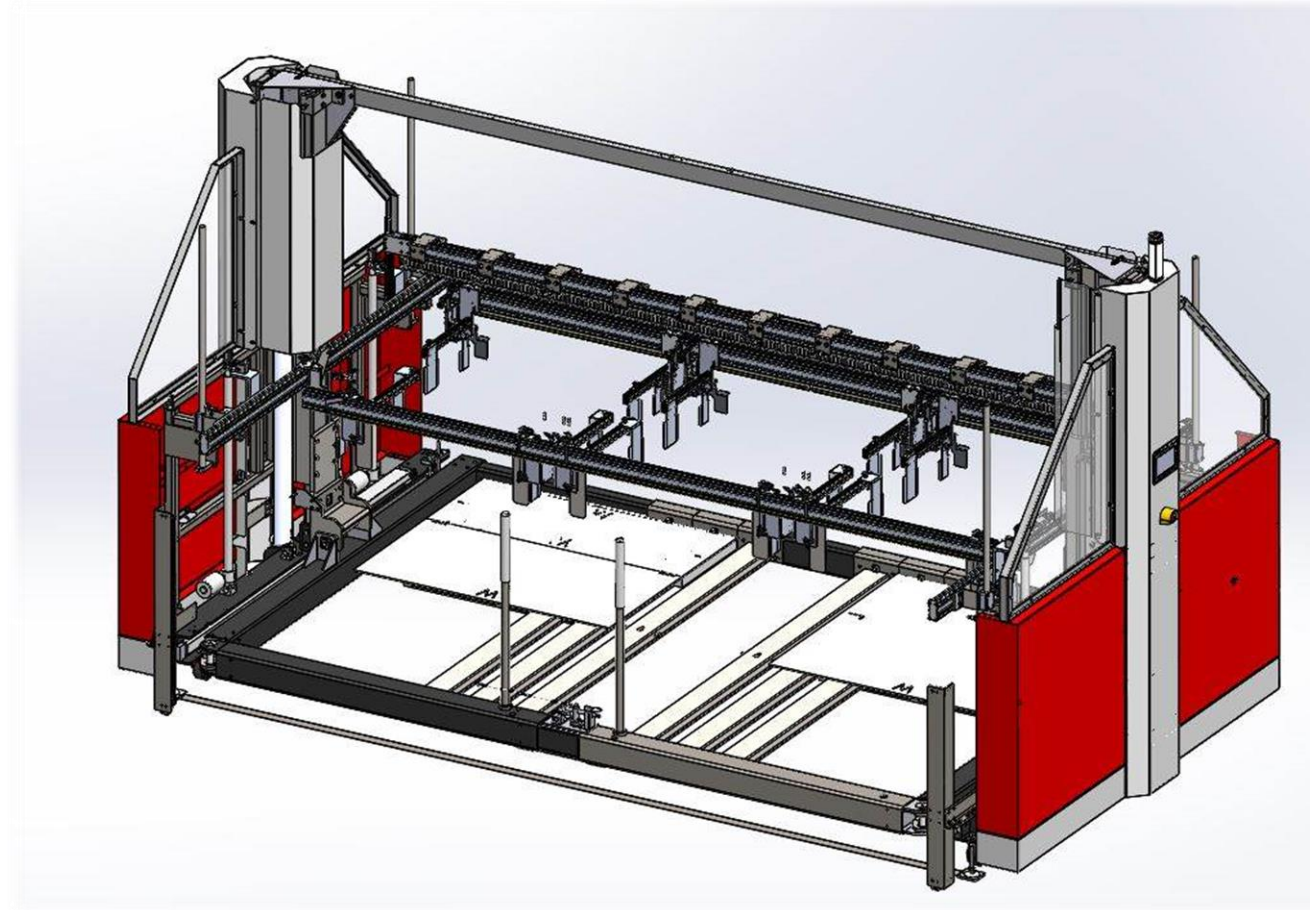
- Design and engineering, structural analysis, innovative approach to vacuum transport design with high precision
- Build / Integration / Testing / Installation of Alpha Unit, continued customer support



Additional Projects

Custom Hydraulic Lift Stacker

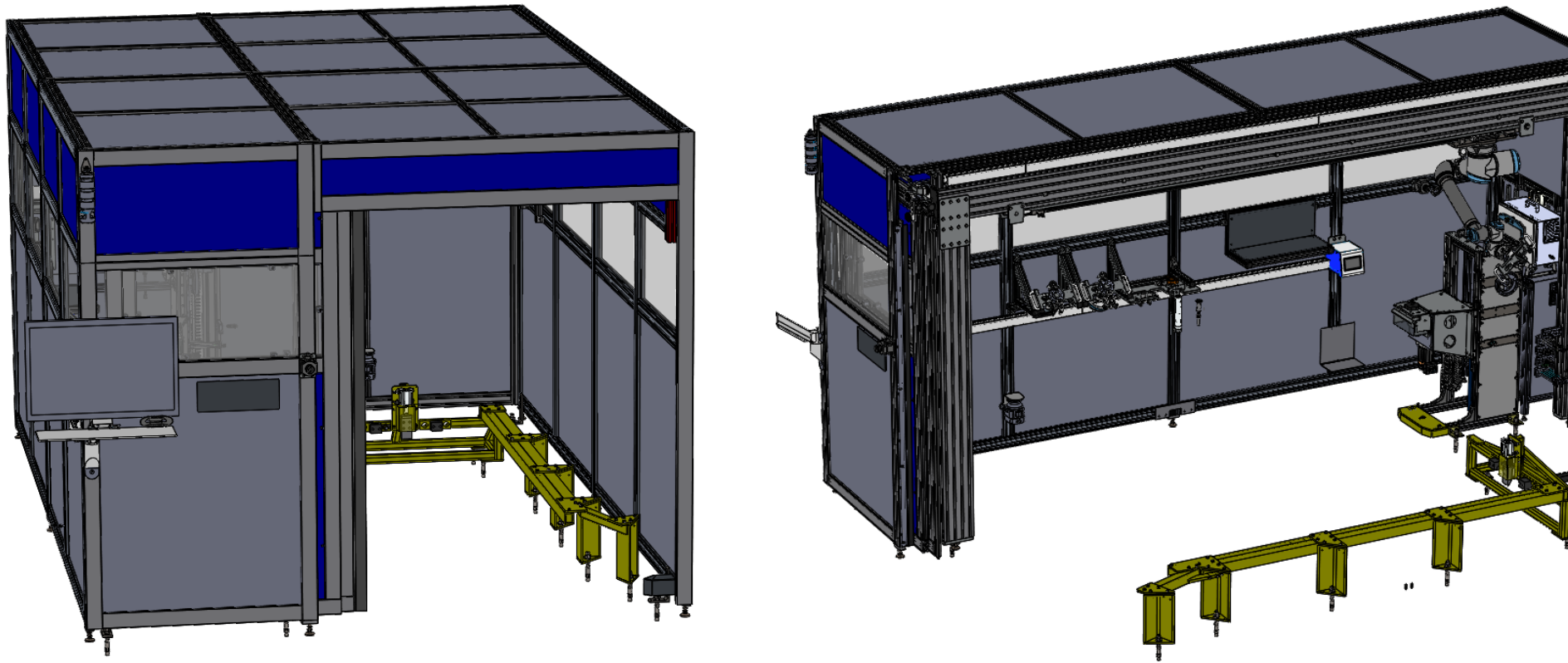
- Design, analyzed, procurement, build integration, testing, pre-production build qty, full operator and service documentation



Additional Projects

Custom 9-Axis Non-contact Inspection System

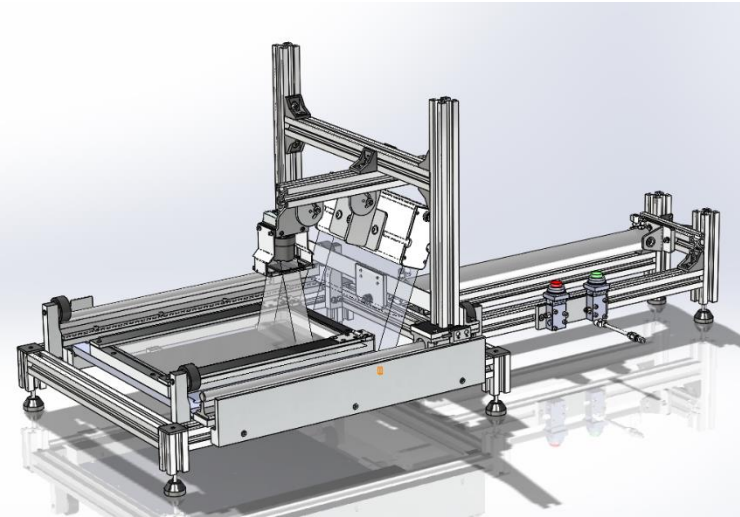
- Custom designed robotic camera application; design, procurement, built and integrated



Additional Projects

Automated Test Stands

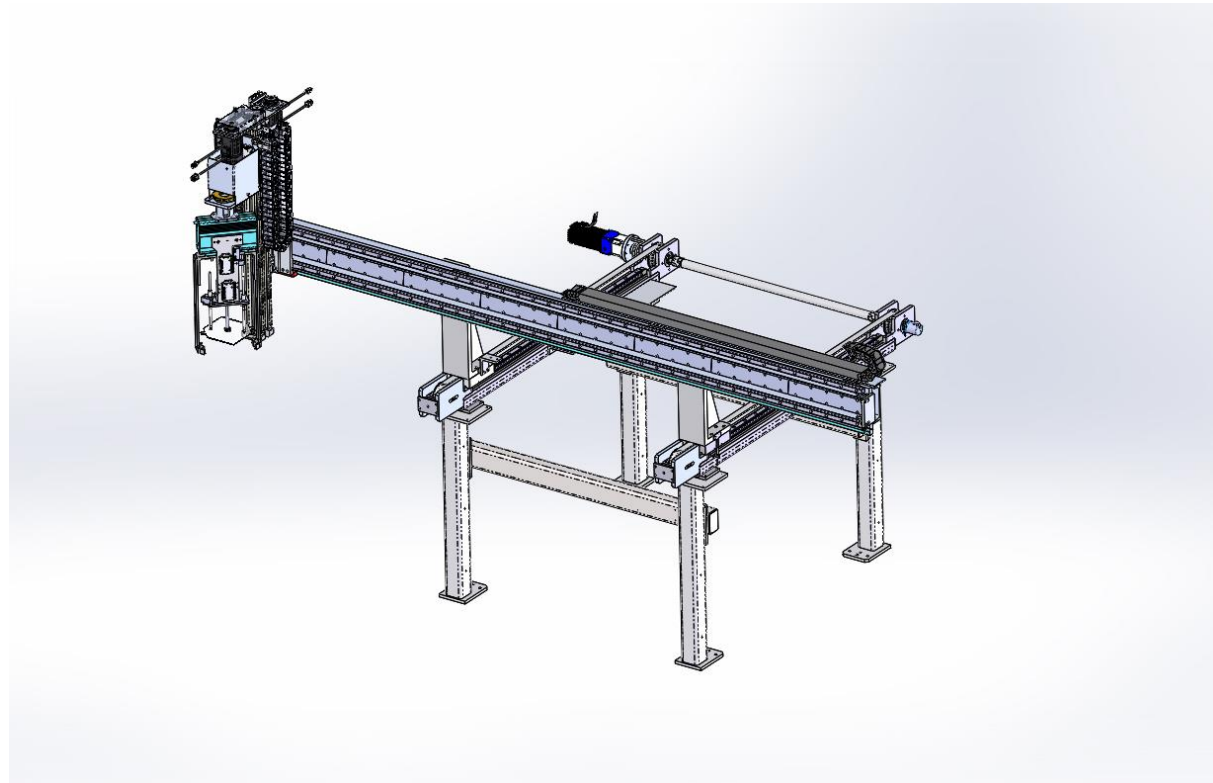
- Engineered, designed and built test stands for device testing
- Multitude of test devices used to support client process development



Additional Projects

Gantry Automation Work Cell for Cryogenic Application

- Participated as part of customer engineering team to provide engineering design, analysis and technical guidance to system design



Additional Projects

Custom High Precision Lift Devices (subsystems of larger machines)

- Design, engineered analysis, high precision and accuracy requirements

