



# AD ENGINEERING, LLC

Multi-Physics Modeling & Simulation | PhD-Level Aerospace R&D  
ESTABLISHED 2020



SERVICE-DISABLED  
VETERAN-OWNED  
CERTIFIED

## 📍 CORE CAPABILITIES

### MODELING & SIMULATION:

- Vibration & Damping Analysis: Modal analysis, frequency response, strain energy methods, loss factor characterization (ANSYS/ABAQUS)
- Thermal-Mechanical Coupling: Coupled heat transfer & structural analysis, transient thermal cycling, high-temperature environments
- Materials Characterization: Johnson-Cook constitutive modeling, temperature-dependent properties, dynamic/impact testing
- Impact & Explicit Dynamics: High-velocity collisions, foreign object damage, ballistic analysis, contact mechanics
- FEA Expertise: ANSYS, ABAQUS (modal, thermal, structural, explicit dynamics, harmonic response)

### SPECIALIZED CAPABILITIES:

- Hypersonics & Thermal Protection Systems
- Heat Transfer & Thermal Management
- Additive Manufacturing Process Optimization
- AI/ML Applications

### DOMAIN EXPERTISE:

- Aerospace Structures & Propulsion Systems
- Turbine Engine Components & Coatings
- Advanced Materials (Ti alloys, Ni superalloys, ceramics, AM alloys)
- Rendezvous & Proximity Operations
- Remote Sensing

## 🛡️ KEY DIFFERENTIATORS

- ✓ PhD + Hands-On: Validated methodologies proven in hypersonic (Mach 8.6) and turbine environments
- ✓ Experimental-FEA Correlation: Both thesis works demonstrate validation against physical testing
- ✓ Materials Expertise: J-C parameters across ceramics, Ti alloys, Ni superalloys, steels
- ✓ AFRL Heritage: 15+ years aerospace R&D experience, deep understanding of DoD requirements
- ✓ Rapid Execution: Agile SDVOSB with TS/SCI clearance and CMMC Level 2 (pending)

## COMPANY PROFILE

**UEI:** CKU6WYGWMPQ5

**CAGE:** 90V00

**SET-ASIDE:** SDVOSB

**CONTACT:**

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**SECURITY:** Active TS/SCI

CMMC Level 2 (Pending)

**LOCATION:**

Dayton, OH (WPAFB access)

Geographically agnostic

**TOOLS & SOFTWARE:**

- ANSYS (Mechanical, Thermal, Explicit)
- ABAQUS (Standard, Explicit)
- Python, MATLAB

**NAICS & PSC CODES**

541330 - Engineering Services

541715 - R&D Physical/Engineering

927110 - Space Research

AZ13 - R&D (Advanced Dev)

B5 - Special Studies Analysis

L0 - Technical Representative

R425 - Support Professional



## REPRESENTATIVE CAPABILITIES

- Materials Database Development: J-C parameters for Vascomax 250/300, Inconel 718, GRX-810; temperature-dependent properties up to 1200°C
- MMOD Passive Solution Development: Orbital debris mitigation analysis
- Turbine Blade Coating Analysis: Damping coefficient determination for thermal protection systems
- High-Velocity Impact Analysis: Hypersonic wear modeling with Johnson-Cook plasticity & thermal-mechanical coupling (PhD dissertation, AFIT)

**adengineering.tech | "Physics-Based Solutions for Aerospace Challenges"**