

# JOHN SMITH

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## MECHANICAL & PROCESS ENGINEER

MECHANICAL ENGINEERING | RESEARCH & DEVELOPMENT | PRODUCT DEVELOPMENT

An accomplished and adaptable mechanical engineer exceling in designing, prototyping, testing, and producing innovative new offerings as well as upgrades that enhance product functionality and use. Provide astute leadership in selecting, onboarding, training, and mentoring engineering interns while driving employee and team development. Handle multiple projects simultaneously, performing well in collaborative, leadership, and individual contributor roles.

### AREAS OF EXPERTISE

Engineering Leadership – Research & Development – Product Design, Testing, & Implementation – Prototyping  
Product Upgrades – Field & Lab Testing – Problem Solving – Process Improvement – 3D/2D Modeling – Analytics  
Team Building – Employee Development – Mentoring – Stakeholder Relations – Communication/Collaboration

### CAREER HIGHLIGHTS

- **Headed pump analysis and design for the XYZ product line at ABC Engineering**, modeling components in SolidWorks to be used in the prototyping process (conducted in an internal lab and with outside vendors); traveled onsite to track prototype pump operations with various clients, collecting data to improve design and release.
- **Designed new diaphragm technology that was initially implemented in the XYZ product line** and later transferred to other pump products at ABC Engineering, addressing and resolving field failure issues.
- **Led design and development of new pump upgrade to expand its features and functionality**, including increasing the max pressure rating of the pump, reducing the pump's oil temperature, preventing premature diaphragm failure, enabling it to run with a closed inlet, and improving operating efficiency.
- **Directed fluid flow and heat transfer analysis in a multi-phase, multi-fluid annular gap flow** in order to identify and develop solutions that enabled clients to size their jet pump oils wells more efficiently.
- **Named on two US patents** for the development of an overmolded rotor design that extends pump life and a diaphragm backup sheet that allows for improved pump application.

### PROFESSIONAL OVERVIEW

ABC ENGINEERING INC.

2007 - PRESENT

#### *Principle R&D Engineer*

Advanced through positions of increasing scope and accountability, providing leadership in R&D, project management, and product development for an ISO 9001 certified operation that generates positive displacement pumps for clients in multiple industries. Work with regional universities and colleges for recruiting and managing of internship programs.

- Develop analytical tools for engineers, including L10 bearing life calculator, disc spring calculator, tolerance stack analysis, and hydraulic spring analysis, complete SolidWorks models, assemblies, and drawings for all projects.
- Reengineered a positive displacement roller pump, incorporating new powder metal and plastic overmolded parts.
- Averted expensive casting and pump redesign by uncovering a cost-effective method to stop leakage in a pump.
- Designed, quoted, and helped build a centrifugal pump test stand for a 1500 GPM / 200 PSI centrifugal pump.
- Led comprehensive testing on a family of three centrifugal pumps to enhance functionality and features.
- Designed and quoted an MMP (coupled piston metering pump) and installed several field test units in Texas.

- Proved vital in implementing the company’s first PDM (file management) systems for SolidWorks.
- Introduced and trained team members on using hyperelastic analysis weekly to improve diaphragm design; adopted ABAQUS FEA to enhance 2D and 3D diaphragm modeling within SolidWorks simulations.
- Calibrated diaphragm testing within failure strain levels in FEA, using 2D/3D hyperelastic models in SolidWorks simulation and Abaqus to prevent rubber damage during pump operation.
- Initiated an internship program and represented the company at University of Wisconsin, Madison and University of Minnesota job fairs; developed engineers and retained qualified candidates for full-time employment.

XYZ CORP.

2006 - 2007

**Pump (Impeller) Design Engineer**

- Completed analysis, product design, and testing for delivery on major defense contracts for jet engine centrifugal pumps (impeller, diffuser, and crossovers) used within the Joint Strike Fighter (JSF) Program.
- Developed multiple analytical tools to facilitate proper use of polymer O-rings in JSF program pumps, including squeeze, stretch, and installation functions.
  - Conducted HP loss analysis on floating seals, carbon face seals, and labyrinth seals.
  - Completed and presented a similarity pump analysis for a lube and scavenge pump to senior decision makers.
  - Leveraged Quasi 3D (and 1D) Impeller Design to complete work on various product lines.

SMITH & ASSOCIATES

2005

**Design Engineer**

- Provided modeling and design work to this engineering firm. Designed strength testing machines to measure how aircraft parts would hold up to harsh conditions such as prolonged exposure to gaseous ammonia.
- Architected a model of the ventilation system of an EPA government building to be used in a \$2M lawsuit.
  - Generated 30+ engineering drawings, including BOM, dimensioning, standards, and call-outs, using SolidWorks.
  - Documented and organized hundreds of pictures used in lawsuits and litigation.

*\*Career Note: Worked as a Statics Instructor, Senior Design Teaching Assistant, Computational Fluid Dynamics Teaching Assistant, Research Assistant, and Statics/Dynamics Teaching Assistant at University of College*

EDUCATION

**Master’s in Engineering Mechanics, Fluid Analysis – UNIVERSITY OF COLLEGE**  
**Bachelor of Science, Mechanical Engineering – UNIVERSITY OF COLLEGE**

PROFESSIONAL DEVELOPMENT

ISO 9001 Training | SolidWorks Simulation | ABAQUS | PDM Training | ASME Y14.5 GD&T Drawing Standards  
Hamilton Sundstrand Centrifugal Pump Design Course (2006) | Centrifugal Pump Design Course  
Harassment at Work, Conflict of Interest, Internet/Email Misusage, and Basic Business Ethics

TECHNICAL SKILLS

Fluent, Gambit, MATLAB, Maple, ANSYS, EES, MathCAD, SolidWorks, AutoCAD, Windows, and MS Office  
Pump Design (Roller, Metering, & Centrifugal), Computation Fluid Dynamics, Impeller Analysis,  
3D-CAD modeling (SolidWorks), 2D Drawings (GD&T ASME Y14.5), and O-ring Analysis (ASME Specifications)