# Dossier: VEXTEC Corporation

## SBIR Award Details

**Award Title:** N/A

**Amount:** $1,249,878.00

**Award Date:** 2023-07-21

**Branch:** USAF

## AI-Generated Intelligence Summary

**Company Overview:**

VEXTEC Corporation is a St. Louis, Missouri-based engineering and software company specializing in physics-based predictive modeling and simulation for materials, structures, and components, primarily serving the defense, aerospace, automotive, and energy industries. Their core mission is to improve product performance, reliability, and safety while reducing development time and costs by providing accurate predictions of material behavior and failure under realistic operating conditions. VEXTEC's unique value proposition lies in its proprietary Virtual Life Management (VLM) software platform, which integrates multi-scale material models with advanced simulation techniques to predict fatigue, creep, fracture, and other failure modes in complex engineering systems. They differentiate themselves by offering a combination of validated simulation software and expert engineering services.

**Technology Focus:**

* Virtual Life Management (VLM) Software:\*\* A software platform enabling users to predict the service life, reliability, and durability of components and structures. VLM integrates physics-based material models at different length scales (e.g., microstructure, component, system) to simulate material behavior under various loading conditions (e.g., fatigue, creep, fracture). It boasts validation against experimental data and is used to optimize designs, reduce testing requirements, and improve predictive maintenance strategies.
* Meso-mechanical Modeling:\*\* VEXTEC uses advanced meso-mechanical models which can consider the complexities of the micro-structure of materials and the various phases and grain structure. This results in more accurate predictions and failure analysis.

**Recent Developments & Traction:**

* SBIR/STTR Awards:\*\* VEXTEC has consistently received Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) awards from the Department of Defense (DoD) and other government agencies for developing advanced simulation capabilities in areas such as high-cycle fatigue, additive manufacturing, and advanced materials. Recent awards include work relating to aircraft engine components.
* Partnerships with Academia:\*\* VEXTEC has demonstrated collaborations with leading universities to advance material modeling and simulation techniques, integrating academic research into practical engineering solutions. Specific examples include work relating to material models for high-temperature environments.
* Industry Deployments:\*\* VEXTEC has secured contracts with major OEMs (Original Equipment Manufacturers) in the defense, aerospace, and automotive industries, demonstrating commercial traction and adoption of its VLM software for real-world engineering applications.

**Leadership & Team:**

* Dr. Steve Arnold (President & CEO):\*\* A recognized expert in material modeling and simulation, with extensive experience in developing and applying advanced simulation techniques to solve complex engineering problems. Holds a Ph.D. in Engineering Mechanics.

**Competitive Landscape:**

* MSC Software (Hexagon):\*\* A provider of simulation software, including finite element analysis (FEA) and multi-body dynamics. VEXTEC differentiates itself by focusing specifically on physics-based material modeling and failure prediction, while MSC offers a broader range of simulation capabilities.
* Ansys:\*\* A provider of engineering simulation software, including FEA, computational fluid dynamics (CFD), and electromagnetic analysis. Similar to MSC, VEXTEC's specialization in multi-scale material modeling and Virtual Life Management sets it apart from Ansys's more general simulation offerings.

**Sources:**

1. [https://www.vextec.com/](https://www.vextec.com/)

2. [https://www.sbir.gov/sbirsearch/detail/2120285](https://www.sbir.gov/sbirsearch/detail/2120285)

3. [https://www.crunchbase.com/organization/vextec-corporation](https://www.crunchbase.com/organization/vextec-corporation)

4. [https://stl.tech.mn/company/vextec-corp](https://stl.tech.mn/company/vextec-corp)