SHALAKA SHINDE

MATERIALS SCIENTIST | THERMALLY SPRAYED COATINGS | FINITE ELEMENT ANALYST

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SUMMARY

Materials scientist and project engineer with 9+ years of experience developing and scaling thermal-spray coating systems for aerospace and industrial OEM applications. Expertise in coating architecture, process optimization, performance validation, Python-based statistical analysis, and finite element modeling using Ansys LS DYNA platform. Track record of transferring research concepts into specification-compliant production solutions.

CORE EXPERTISE

Thermal-Spray Coatings | Materials & Coating Architecture | Process Optimization | Performance Validation | Production Scale-Up | Multivariable Statistics | Python | Finite Element Modeling | Coating Characterization (Elastic modulus, thermal conductivity, etc.) and Performance Evaluation (Burner Rig, FCT, Erosion, etc.) | Technical Project Management.

PROFESSIONAL EXPERIENCE

OERLIKON METCO | Westbury, NY **2022-Present**

Project Engineer

- Serve as technical lead for specification-compliant coating and material solutions for aerospace and industrial OEM programs, spanning material selection, process optimization, validation, and production transfer.
- Design custom performance-test equipment and standardize Python-based multivariable analysis workflows that connect experimental data with technical performance targets.
- Apply statistical modeling and finite element methods to optimize coating architectures and anticipate service behavior under demanding operating conditions.
- Advance sustainable metallic abradable and CMAS-resistant ceramic material systems for high-temperature turbine applications.

CENTER FOR THERMAL SPRAY RESEARCH (CTSR) | Stony Brook, NY **2016-2022**

Research Scientist

- Conducted advanced materials research integrating coating experiments, statistical analysis, and computational modeling to connect thermal-spray process conditions with microstructure and performance.
- Investigated segmentation and delamination cracking in plasma-sprayed ceramic coatings through experimental mechanics and finite element modeling.
- Collaborated with Honeywell Aerospace, the University of California, Santa Barbara, and Indian Institute of Technology Bombay to translate laboratory research into production parameters and new coating-fracture evaluation methods.
- Authored peer-reviewed research on coating adhesion, segmentation cracking, delamination, and interfacial fracture energy in thermally sprayed systems.

TECHNICAL PROJECTS

SUSTAINABLE METALLIC ABRADABLE MATERIALS | Oerlikon Metco **2024-2025**

- Developed cobalt-free material chemistries for metallic abradable powders; assessed composition, spray ability, and performance to support sustainable product development.

CMAS-RESISTANT THERMAL BARRIER COATINGS | Rolls-Royce Corporation **2022-2025**

- Integrated CMAS-resistant ceramics and high-entropy oxides into multilayer architectures for high-pressure turbine components, targeting improved durability through reduced interfacial stress.

HIGH-TEMPERATURE SHROUD ABRADABLE SYSTEM | Power Systems Mfg. **2022-2024**

- Directed end-to-end development of a multilayer abradable coating system implemented in production for high-temperature shroud applications.

LOW-CONDUCTIVITY THERMAL BARRIER COATING | Honeywell / CTSR **2016-2019**

- Optimized air plasma spray parameters for a novel low-conductivity coating subsequently qualified for production use on aerospace engine blades.

EDUCATION

STONY BROOK UNIVERSITY | Stony Brook, NY **2016-2022**

Doctor of Philosophy in Materials Science

GPA: 4.0/4.0 | Department Academic Excellence Award

Dissertation: Mechanisms of Segmentation and Delamination Cracking in Plasma-Sprayed Ceramic Coatings

INDIAN INSTITUTE OF SCIENCE | Bengaluru, India **2012-2016**

Bachelor of Science (Research), Materials Science

Graduated with First Class

PUBLICATIONS

- **Shinde, S.; Sampath, S.** "A Critical Analysis of the Tensile Adhesion Test for Thermally Sprayed Coatings." *Journal of Thermal Spray Technology 31(8), 2247-2279. Editor's Choice, 2022.*
- **Shinde, S.; Sampath, S.** "Factors Governing Segmentation Crack Characteristics in Air Plasma Sprayed Ceramics." *Journal of the European Ceramic Society 42(3), 1077-1087.*
- **Shinde, S.; Sampath, S.** "Interplay Between Cracking and Delamination in Incrementally Deposited Plasma Sprayed Coatings." *Acta Materialia 215, 117074.*
- **Shinde, S.; Gildersleeve, E.; Johnson, C.; Sampath, S.** "Segmentation Crack Formation Dynamics During Air Plasma Spraying of Zirconia." *Acta Materialia 183, 196-206.*

AWARDS

- Editor's Choice Review Article, Journal of Thermal Spray Technology (2022).
- Oerlikon Metco Young Professional's Award - Best Paper/Presentation, ITSC (2019).
- International Thermal Spray Association Annual Scholarship (2017).