

CURRICULUM VITAE



Name : Dr. G Sivakumar

Qualification : B.E. (Mechanical Engg)
PhD in Metallurgical Engg &
Materials Science, IIT-Bombay

Present designation : Scientist 'E'

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Research Experience : **16 years**, as Scientist-B,C,D at ARCI, Hyderabad

Research areas of interest

- Thermal spray techniques like Solution Precursor Plasma spraying, Detonation spraying (D-gun), Cold gas dynamic spraying, Atmospheric Plasma Spraying
- Development of novel functional and high performance coatings
- In-flight particle diagnosis
- Materials characterization and performance studies
- Tribological studies

Awards

- Best Ph.D. Thesis under "Innovative Student Projects", awarded by Indian National Academy of Engineering (INAE)

Sponsored Projects handled

Year of Funding	Sponsoring Organization	Title of Project
2003	NMITLI (CSIR)	Nano Material Coatings and Advanced Composites for Tribological Applications in Automotive Industry
2005	ARDB	Development of Ultrafine WC-Co powders for Detonation Spraying
2006	Private	Development of cathode coatings for SOFCs
2012	Private	Development of erosion-corrosion resistant coatings for boiler tubes
2013	Private	Development of high temperature coatings for copper tuyeres
2013	VSSC, Trivandrum	Assessment of thermal cyclic life for alumina bricks
2014	DST-EPSRC	Improvements in gas turbine performance via novel plasma spray coatings offering protection against ingested species

2014	DAE-IPR	Development of Tungsten Coating Technology for First Wall Application in ITER like tokamak
2014	BRNS	Simulation studies on solution plasma spraying of ceramic materials
2015 (sanctioned)	ARDB	Performance of coatings under fretting wear conditions

Journal Publications

- 1) G. Sundararajan, D. Sen, G. Sivakumar, The tribological behaviour of detonation sprayed coatings: the importance of coating process parameters, *Wear*, Vol. 258, 2005, P. 377-391.
- 2) S.R. Pulugurtha, D.G. Bhat, M.H. Gordon, J. Shultz, M. Staia, S.V. Joshi, G. Sivakumar, "Mechanical and tribological properties of compositionally graded CrAlN films deposited by AC reactive magnetron sputtering", *Surface & Coatings Technology*, 202, 1160–1166, 2007
- 3) G. Sundararajan, G. Sivakumar, D. Sen, D. Srinivasa Rao and G. Ravichandra, "The tribological behaviour of detonation sprayed TiMo(CN) based cermet coatings", *International Journal of Refractory Metals and Hard Materials*, 28, 71–81, 2010.
- 4) G.Sundararajan, Naveen M Chavan, G.Sivakumar, P.Sudharshan Phani, "Evaluation of parameters for assessment of inter splat bond strengths in Cold Sprayed coatings", *Journal of Thermal Spray Technology*, 19(6), 1255-1266, 2010
- 5) G. Sivakumar, R.O. Dusane, and S.V. Joshi, "In situ Particle Generation and Splat Formation During Solution Precursor Plasma Spraying of Yttria-Stabilized Zirconia Coatings", *Journal of American Ceramic Society*, 94 (12) 4191–4199, 2011
- 6) Rekha Dom, G. Sivakumar, Neha Y. Hebalkar, Shrikant V. Joshi, and Pramod H. Borse, "Deposition of nanostructured photocatalytic zinc ferrite films using solution precursor plasma spraying, *Materials Research Bulletin*, 47 (3) 562-570, 2012
- 7) Nirmala Sanikommu, G Sivakumar, A S Joshi, N Aruna, D S Rao and G Sundararajan "A Computer –based approach for developing functionally graded and layered coatings with detonation spray coating process", *Journal of Scientific and Industrial Research*, 72, 477-480, 2013
- 8) G. Sivakumar, Rajiv O. Dusane and Shrikant V. Joshi, A novel approach to process phase pure α -Al₂O₃ coatings by solution precursor plasma spraying', *Journal of the European Ceramic Society*, 33 (2013) 2823–2829
- 9) Rekha Dom, G. Siva Kumar, Neha Y. Hebalkar, Shrikant V. Joshi and Pramod H. Borse, "Eco-friendly ferrite nanocomposite photoelectrode for improved solar hydrogen generation", *RSC Advances*, 2013, 3, 15217-15224
- 10) S.V. Joshi, G. Sivakumar, T. Raghuveer and R.O. Dusane, "Hybrid plasma sprayed thermal barrier coatings using powder and solution precursor feedstock", *Journal of Thermal Spray Technology*, 23(4), 616-624, 2014
- 11) A. Lohia, G. Sivakumar, M. Ramakrishna and S.V. Joshi, "Deposition of Nanocomposite Coatings employing a Hybrid APS + SPPS Technique", *Journal of Thermal Spray Technology*, 23(7), 1054-1064, 2014
- 12) Rekha Dom, G. Siva Kumar, Hyun Gyu Kim, Shrikant V. Joshi, A. Sadananda Chary and Pramod H. Borse, "Design and development of ferrite composite film electrode for photoelectrochemical energy application", *Materials Science Forum Vol. 781 (2014) pp 45-61*
- 13) G. Sivakumar, R.O. Dusane, and S.V. Joshi, "Understanding the Formation of Vertical cracks in Solution Precursor Plasma Sprayed Yttria-Stabilized-Zirconia Coatings", *Journal of American Ceramic Society*, 97(11), 3396-3406, 2014
- 14) Prashant Nehe, G. Sivakumar, Sudarshan Kumar, Solution Precursor Plasma Spray (SPPS) technique of catalyst coating for hydrogen production in a single channel with cavities plate type methanol based microreformer, *Chemical Engineering Journal* 277 (2015) 168–175

- 15) A. Ajay, V.S. Raja, G. Sivakumar, S.V. Joshi, Hot corrosion behavior of solution precursor and atmospheric plasma sprayed thermal barrier coatings, *Corrosion Science* (2015), <http://dx.doi.org/10.1016/j.corsci.2015.05.034>
- 16) S.V. Joshi and G. Sivakumar, Hybrid processing with powders and solutions: A novel approach to deposit composite coatings, *Journal of Thermal Spray Technology*, In Press, 2015

Patents

- 1) G. Sivakumar and Shrikant V. Joshi, "An Improved hybrid methodology for producing composite, multi-layered and graded coatings by plasma spraying utilizing powder and solution feedstock", ARCI patent appln. no. 2965/DEL/2011 and United Pat No. US2013/0095340A1 dt. 18th Apr, 2013.

Contribution to Books

- G.Sivakumar and S.V.Joshi, "*Cold Gas Dynamic Spraying*", in *Surface Engineering*, D.Srinivasa Rao and S.V.Joshi eds., Centre for Science & Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre), 2010.
- G. Sundararajan, L. Rama Krishna, N.P. Wasekar, G. Sivakumar and A. Jyothirmayi, *Coatings for Corrosion Resistance* in "*Corrosion Science and Technology: Mechanisms, Mitigation and Monitoring*", Pubs: Taylor & Francis-UK, Narosa-India, 2008, p. 243-283, ISBN 81-7035-628-8, 978-81-7035-628-8.
- G. Sundararajan, D. Srinivasa Rao, G. Sivakumar and S.V. Joshi, "*Detonation Spray Coatings*", in *Encyclopedia of Tribology*, Jane Wang & Wah Chung (Eds.), Publisher: Springer Science + Business Media, 736-742, 2013.
- G. Sivakumar, and S. V. Joshi. "Composite Coatings Employing a Novel Hybrid Powder and Solution-Based Plasma Spray Technique for Tribological Applications." In M. Roy, & J. Davim (Eds.) *Thermal Sprayed Coatings and their Tribological Performances*. IGI Global, 2015. 61-87. Web. 19 May. 2015. doi:10.4018/978-1-4666-7489-9.ch003
- D. S. Rao, G. Sivakumar, D. Sen, and S.V. Joshi, *Detonation Sprayed Coatings and their Tribological Performances*. In M. Roy, & J. Davim (Eds.) *Thermal Sprayed Coatings and their Tribological Performances*, IGI Global, 2015. (pp. 294-327). Hershey, PA: Engineering Science Reference. doi:10.4018/978-1-4666-7489-9.ch010

Conference proceedings

1. "Process parameter studies to achieve phase pure α -Al₂O₃ coatings during solution precursor plasma spraying", Proc. ATSC 2014, 2014.
2. "Thermal Spray Coatings for Blast Furnace Tuyere", Proc. ATSC 2014, 2014.
3. "Correlation Studies Between In-flight Particle Characteristics, Splat Formation and Microstructure of Atmospheric Plasma Sprayed XPT 512 Powder", Proc. ATSC 2014, 2014.
4. "Effects of Vanadates on High Temperature Degradation Behavior of Solution Precursor Plasma Sprayed Thermal Barrier Coatings", Proc. ATSC 2014, 2014.
5. "Development of Tungsten Coating using Atmospheric Plasma Spraying for First Wall Applications in Fusion TOKAMAK", Proc. ATSC 2014, 2014.

6. "Hybrid plasma sprayed thermal barrier coatings using powder and solution precursor feedstock", Proc. ATSC 2012, 2012, 89-90.
7. Comparison of detonation and plasma sprayed low alloy steel coatings for tribological applications, Proc of 3rd ATSC, 2008.
8. G. Sundararajan, G. Sivakumar, R. Kavitha, A.R.Phani krishna, Eroison behaviour of Composite Cermet Coatings, Proceedings of 'Developments in Composites: Advanced, Infrastructural, Natural and Nanocomposites', 2006, 553-558.
9. D.Sivaprahasam, G.Sivakumar, R.Vijay and R. Sundaresan, Mechanically Alloyed Fe-SiC Powder for Detonation Spray Coating', in "Trends in Mechanical Alloying", P.R.Soni and T.V. Rajan, Editors, Oxford & IBH Publishing, New Delhi, Kolkata, 2002, pp. 84-95.
10. G.Sundararajan, G.Sivakumar, D.Srinivasa rao, The Interrelationship between Particle Temperature and Velocity, Splat Formation and Deposition Efficiency in Detonation Sprayed Al₂O₃ Coatings, *Thermal Spray 2001: New Surfaces for a New Millennium*, (Ed.) C.C. Berndt, K.A. Khor, and E.F. Lugscheider, ASM International, Materials Park, Ohio, USA, 2001,p.849-858.
11. G. Sivakumar, L. Rama Krishna, V. Jain, D.S. Rao, G. Sundararajan, and G.M. Reddy, The Influence of the Process Parameters on the Properties of Detonation Sprayed WC-12Co Coatings, *Thermal Spray 2001: New Surfaces for a New Millennium*, (Ed.) C.C. Berndt, K.A. Khor, and E.F. Lugscheider, ASM International, Materials Park, Ohio, USA, 2001, p. 1031-1038.
12. KRC. Somaraju, G.Sivakumar, D.Srinivasa rao, G.Sundararajan, The Influence of Powder characteristics on the properties of Detonation sprayed Cr₃C₂-25NiCr coatings, Proceedings of the International Thermal Spraying Conference 2000, P.309-316