

CURRICULUM VITAE

Name: *Dr.Naveen Manhar Chavan*

Qualification: *B.Tech (Metallurgy, MGIT-JNTU Hyderabad)*

PhD(Metallurgy, IIT Bombay)

Designation: *Scientist E*

Contact information : *Cold spray Laboratory, Centre for Engineered Coatings, International Advanced Research Centre for Powder Metallurgy and New Materials, Balapur, Hyderabad-500005*

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Experience: *15 years*

Areas of Interest: *Surface Engineering (Cold Gas Dynamic Spray, D-Gun), Process diagnostics in thermal spray, Mechanical Behaviour of Metals, Structure-Property correlation, Corrosion.*



Awards/Distinctions/ Scientific and Scholastic Achievements

- *Nominated as a young scientist by the ARCI-DST to attend the International Youth Forum “**INTERRA2011**” held in September 2011 in Novosibirsk, Siberia, Russia.*
- *University **Gold Medalist** in Engineering (2002 to 2006)*
- *All India Rank of **119** and **35** in GATE 2006 and 2008 respectively*
- *Institute topper in intermediate (2002, Railway Junior College, Lalaguda, Secunderabad)*
- *School Topper in Matriculation (2000, Pragathi High School)*
- *Presented papers in National Level contests viz., **COGNIZANCE2006** at IIT Roorkee, Srujana JNTU, Hyderabad.*
- *Actively participated as an organizing committee member of “**Frontiers of Metallurgy and Materials Technology- A National Convention**” held in 2003 at MGIT Hyderabad.*
- *Played an important role in organizing the “**Two day Thermal Spray Course**” at ARCI, Hyderabad from 22nd -23rd November 2014.*
- *Played a pivotal role in organizing the **6th Asian Thermal Spray Conference (ATSC 2014)** held at Hotel Novotel Airport Hyderabad, Hyderabad during 24-26th November 2014.*

List of Patents and Publications:

Patents:

1. An improved gas dynamic cold spray device and method of coating a substrate, **Naveen M Chavan**, S Kumar, PS Phani and DS Rao, Indian Patent Application: 201711006749, Under examination
2. An improved gas dynamic cold spray device and method of coating a substrate, **Naveen M Chavan**, S Kumar, PS Phani and DS Rao, Russian Patent Application:2744008 (Granted—May 2021)
3. An improved gas dynamic cold spray device and method of coating a substrate, **Naveen M Chavan**, S Kumar, PS Phani and DS Rao, Chinese Patent Application: [201880013832.3](#), Under examination
4. An improved gas dynamic cold spray device and method of coating a substrate, **Naveen M Chavan**, S Kumar, PS Phani and DS Rao, Patent Cooperation Treaty Application: WO2018154599 (Filed in 2018)
5. Anti-Clogging Cold-Spray Nozzle to deposit Clog-Prone Materials, S Kumar, , **Naveen M Chavan** and Yogeswar Kovvuru, Filed in India (March 2022)

Publications in peer reviewed journals:

1. Vinay G, **Naveen Manhar Chavan**, S Kumar, A Jyothirmayi and Bolla Reddy B, Improved microstructure and properties of cold sprayed zinc coatings in the as sprayed condition, Surface and Coatings Technology (2022).
2. S Kumar, A Dhawale, **Naveen Manhar Chavan**, S Acharya, Superconducting niobium coating deposited using cold spray, Materials Letters(2022), 132, 113715.
3. Kumar, S., Bodapati, B.R., Vinay, G., Vamshi Kumar, K., **Chavan, N.M.**, Suresh Babu, P., Jyothirmayi, A., Estimation of inter-splat bonding and its effect on functional properties of cold sprayed coatings(2021), Surface and Coatings Technology, 420, art. no. 127318.
4. Vinay, G., Kumar, S., **Chavan, N.M.** Generalised bonding criteria in cold spraying: Revisiting the influence of in-flight powder temperature (2021), Materials Science and Engineering A, 823, art. no. 141719
5. **Chavan, N.M.**, Phani, P.S., Ramakrishna, M., Venkatesh, L., Pant, P., Sundararajan, G. Role of stacking fault energy (SFE) on the high strain rate deformation of cold sprayed Cu and Cu–Al alloy coatings,(2021) Materials Science and Engineering A, 814, art. no. 141242
6. **Chavan, N.M.**, Vinod Kumar, M., Sudharshan Phani, P., Pant, P., Sundararajan, G. Influence of Nozzle Throat Cross Section on Microstructure and Properties of Cold Sprayed Coatings(2019) Journal of Thermal Spray Technology, 28 (7), pp. 1718-1729.
7. Anupam, A., Kumar, S., **Chavan, N.M.**, Murty, B.S., Kottada, R.S. First report on cold-sprayed AlCoCrFeNi high-entropy alloy and its isothermal oxidation(2019),Journal of Materials Research, 34 (5), pp. 796-806.
8. Krishna, L.R., Madhavi, Y., Sahithi, T., Wasekar, N.P., **Chavan, N.M.**, Rao, D.S. Influence of prior shot peening variables on the fatigue life of micro arc oxidation coated 6061-T6 Al alloy (2018) International Journal of Fatigue, 106, pp. 165-174.

9. Kumar, S., Ramakrishna, M., **Chavan, N.M.**, Joshi, S.V. Correlation of splat state with deposition characteristics of cold sprayed niobium coatings (2017), *Acta Materialia*, 130, pp. 177-195. Cited.
10. Kumar, M., Singh, H., Singh, N., **Chavan, N.M.**, Kumar, S., Joshi, S.V. Development of Erosion-Corrosion-Resistant Cold-Spray Nanostructured Ni-20Cr Coating for Coal-Fired Boiler Applications(2015) *Journal of Thermal Spray Technology*, 24 (8), pp. 1441-1449.
11. Kaur, N., Kumar, M., Sharma, S.K., Kim, D.Y., Kumar, S., **Chavan, N.M.**, Joshi, S.V., Singh, N., Singh, H. Study of mechanical properties and high temperature oxidation behavior of a novel cold-spray Ni-20Cr coating on boiler steels (2015) *Applied Surface Science*, 328, pp. 13-25
12. Kumar, M., Singh, H., Singh, N., Hong, S.-M., Choi, I.-S., Suh, J.-Y., **Chavan, N.M.**, Kumar, S., Joshi, S.V. Development of nano-crystalline cold sprayed Ni-20Cr coatings for high temperature oxidation resistance (2015) *Surface and Coatings Technology*, 266, pp. 122-133.
13. Sundararajan, G., **Chavan, N.M.**, Kumar, S. The elastic modulus of cold spray coatings: Influence of inter-splat boundary cracking (2013) *Journal of Thermal Spray Technology*, 22 (8), pp. 1348-1357.
14. **Chavan, N.M.**, Kiran, B., Jyothirmayi, A., Phani, P.S., Sundararajan, G. The corrosion behavior of cold sprayed zinc coatings on mild steel substrate(2013) *Journal of Thermal Spray Technology*, 22 (4), pp. 463-470.
15. Venkatesh, L., **Chavan, N.M.**, Sundararajan, G. The influence of powder particle velocity and microstructure on the properties of cold sprayed copper coatings(2011), *Journal of Thermal Spray Technology*, 20 (5), pp. 1009-1021.
16. **Chavan, N.M.**, Ramakrishna, M., Phani, P.S., Rao, D.S., Sundararajan, G., The influence of process parameters and heat treatment on the properties of cold sprayed silver Coatings (2011), *Surface and Coatings Technology*, 205 (20), pp. 4798-4807.
17. Sundararajan, G., **Chavan, N.M.**, Sivakumar, G., Sudharshan Phani, P. Evaluation of parameters for assessment of inter-splat bond strength in cold-sprayed coatings (2010), *Journal of Thermal Spray Technology*, 19 (6), pp. 1255-1266.
18. Sen, D., **Chavan, N.M.**, Rao, D.S., Sundararajan, G. Influence of grit blasting on the roughness and the bond strength of detonation sprayed coating (2010), *Journal of Thermal Spray Technology*, 19 (4), pp. 805-815.

Conference proceedings:

1. G Sundararajan, **Naveen M Chavan** and G Sivakumar, "Effect of heat treatment on properties of thick thermal spray coatings", International Conference on Metallurgical Coatings & Thin Films, April- May 2008, San Diego, USA.
2. **Naveen M Chavan**, PS Phani and G Sundararajan, Effect of Process Parameters and Heat treatments on the properties of cold sprayed silver coatings, Proceedings of the Asian Thermal Spray Conference, November 2008, Nanyang Technological University, Singapore. (Oral Presentation)
3. **Naveen M Chavan**, A Jyothirmayi, Kiran B, G Sundararajan, Corrosion behavior of Cold sprayed Zinc coatings", 14th National Congress on Corrosion Control in India, September 2008, Hyderabad, India
4. Kumar, M., Singh, H., Singh, N., **Chavan, N.M.**, Kumar, S., Joshi, S.V ,Development of Erosion-Corrosion-Resistant Cold-Spray Nanostructured Ni-20Cr Coating for Coal- Fired Boiler Applications, 6th Asian Thermal Spray Conference (ATSC 2014), Hyderabad, India

5. **Naveen Manhar Chavan**, L Venkatesh, P Suresh Babu, Prita Pant, G Sundararajan, Cold Sprayed Copper and Copper Aluminium Alloys: Influence of Stacking Fault Energy on the Structure and Properties, SMT 30-Politecnico Di Milano- Milan, Italy-July 2016
6. Kumar, M., Singh, H., Singh, N., Joshi, S.V., **Chavan, N.M.**, Kumar, S. Evaluation of high temperature oxidation behavior of a cold spray Ni-20Cr nano-structured coating(2016), Proceedings of the International Thermal Spray Conference, 1, pp. 220-225.
7. Kumar, M., Singh, H., Singh, N., **Chavan, N.M.**, Kumar, S., Joshi, S.V. Development of high-performance cold-sprayed nanostructured ni-20cr coatings for harsh environment of power plant boilers (2017) Proceedings of the International Thermal Spray Conference, 2, pp. 1061-1066.

Projects handled under various capacities:

1. Development of high conductivity-oxidation resistant 3 mm thick pure silver coatings on SS boiler tubes using cold spray facility, 2007-2008, Funding agency: BHEL Trichy -INR 6 Lakh (as PI)
2. Development of Zn and Sn based composite coatings on Al busbars for Siemens India for friction stir welding applications, 2010-2011, Funding agency: Siemens India, Bengaluru - INR 5 lakh (as co-PI)
3. Developmental studies on feasibility to deposit Ni-Cr and Inconel coatings for repair applications, 2013, Funding agency: GE Bengaluru - INR 3.5 lakh (as co-PI)
4. Development of superconducting Niobium coatings on Cu cavities-Phase 1, 2015-2018, Funding agency: BRNS, BARC Mumbai, INR 23 lakh (as co-PI)
5. Development of thick and highly conductive copper coatings on six sides of cubical shape SS for plasma facing applications, 2014, Funding agency: IPR Gandhinagar – IIT Ropar, INR 3.5 lakh (as PI)
6. Structural repair of Al aerospace alloys using cold spray, 2015-2018, Funding agency: Boeing India Bengaluru, INR 78 lakh (as co-PI)
7. Development (and supply) of Cu and refractory based composite coatings for electromagnetic rail gun applications, 2015-2018, Funding agency: ARDE, DRDO, Pune, INR 37 lakh
8. Development of biocompatible Ti coatings on SS, PEEK substrates and implants for invitro and invivo studies, 2017 to 2020, Funding agency: Wissenkraft Pune, INR- 3 lakh (as PI and co-PI)
9. Development of high entropy alloy coatings using cold spray as potential bond coat replacements, 2015-2020, Funding agency: ARDB, Bengaluru, INR 50 lakh (as co-PI)
10. Development and supply of repaired Al, Ti, Steel and Inconel parts—Stage-1, 2021-2022, Funding agency: VSSC Trivandrum, INR- 4.99 lakh (as PI)
11. Development of repair solution for Ni based, Al based and steel based components, 2022, Funding agency: VSSC Trivandrum, INR- 9 lakh (as co-PI)

12. Development of Cu coating on Ammunition, awaited in 2022, Funding agency: ARDE, DRDO Pune, INR-25 lakh, (as co-PI)
13. Development of cermet coatings using cold spray and comparison with other thermal spray techniques to analyse decarburization behavior, Proposal submitted to DST-SERB, 2021 (as co-PI)

Affiliation to Professional societies:

- Life member, Indian Institute of Metals (IIM).
- Life member , Materials Research Society of India (MRSI)
- Life member: Society of Automotive Engineers (SAE)