

Name

Dr. N. Ravi

Designation

Scientist 'F'

Qualification

Ph.D.

Experience

27 Yrs. of R&D

Research Areas of Interest

Nanocomposite coatings and Mechanical Characterization

**List of Journal Publications**

1. K. Gopalakrishna, N. Ravi, and T.P. Bagchi, P/M Grade Sponge Iron Powders from Bule Dust: A Comparative Assessment, published in Transaction of PMAI, 21(1994) p. 42
2. N. Ravi, "Nickel-Graphite Abradable Seals for the Gas Turbines", published in 'Nonferrous Materials News Letter' published by TIFAC, MRSI, and DMRL, Vol. 1(4), August 1994
3. J. Janardhan Reddy, N. Ravi, and M. Vijaykumar, "A Simple Model for Viscosity of Powder Injection Moulding Mixes with Binder Content above Powder Critical Binder Volume Concentration". published in Journal of European Ceramic Society 20 (2000) p. 2183
4. N. Ravi, I.G. Varshavskaya, V.L. Bukhovets, and G. Sundararajan, "Deposition of Diamond-like Carbon Films on Aluminium Substrates by RF-PECVD Technique: Influence of Process Parameters", Diamond and Related Materials, 16 (2007) p.90
5. P. Ramavath, N. Ravi, U.S. Harish, R. Johnson, N. Eswara Prasad, "Compression and Flexural Strength Properties of ZnS Optical Ceramics", Published in Transactions of Indian Institute of Metals, Vol. 63(6), Dec. 2010, p.847.
6. Nithin P. Wasekar, N. Ravi, P. Surech Babu, L. Ramakrishna, and G. Sundararajan, "High cycle fatigue behaviour of microarc oxidation coatings deposited on a 6061-T6 Al alloy", published in Met. and Mat. Trans. A, 41A (2010), p 255
7. G. Sundararajan, Nithin P. Wasekar and N. Ravi, "The influence of the coating technique on the high cycle fatigue life of alumina coated Al6061 alloy", published in Trans IIM, 63(1&2) (2010) p i42

8. B. Papita, M. Buchi Suresh, N. Ravi, Dibakar Das and Roy Johnson, "Effect of low temperature thermal cycling on thermo-mechanical behaviour of Al₂TiO₅ ceramics" accepted for proceedings of Indian Ceramic Society.
9. P.N. Krishnan, S. Ganesh Sundararaman, S.D. Pathak, R. Gnanamoorthy, and N. Ravi, "Fretting wear studies on Diamond-like carbon coated Ti-6Al-4V", *Surface & Coatings Technology*, 203(2009), p1205-1212
10. P.N. Krishnan, S. Ganesh Sundararaman, S.D. Pathak, R. Gnanamoorthy, and N. Ravi, "Relative performance of hydrogenated, argon-incorporated, and nitrogen incorporated DLC coated Ti-6Al-4V samples under Fretting Wear", *Thin Solid Films*, 517 (2009), p4365-4371
11. N. Ravi, R. Markandeya and S. V. Joshi, "Effect of nitrogen pressure on mechanical properties of nc-TiAlN/a-Si₃N₄ nanocomposite coatings deposited by cathodic arc PVD process", *Materials Today: Proceedings* 3 (2016) 3002-3011.
12. N. Ravi, R. Markandeya and S. V. Joshi, "Effect of substrate roughness on adhesion and tribological performance of nc-TiAlN/a-Si₃N₄ nanocomposite coatings deposited by cathodic arc PVD process", *Surface Engineering*, DOI: 10.1179/1743294415Y.0000000005, 2016, 1-13.
13. N. Ravi, R. Markandeya and S. V. Joshi, "Fracture behaviour of nc-TiAlN/a-Si₃N₄ nanocomposite coating during nanoimpact test", *Surface Engineering*, DOI: 10.1080/02670844.2016.1239853, 1-10.
14. P. Biswas, P. Ramavath, Ch. M. Nair, M. B. Suresh, N. Ravi and R. Johnson, "Quasi-static compression behaviour of nickel oxide, nickel oxide: zirconia, nickel-zirconia and nickel foams", *Ceramics International* 42 (2016) 10572-10578.
15. P. Ramavath, P. Biswas, N. Ravi and R. Johnson, "Prediction and validation of buckling stress of the ceramic honeycomb cell walls under quasi-static compression", *Cogent engineering*, DOI: 10.1080/23311916.2016.1168068, 2016, 1-7.
16. P. Panda, B. Sravani, R. Ramaseshan, N. Ravi, F. Jose, S. Dash and A. K. Tyagi, "Growth and Characterization of highly oriented AlN films by DC reactive magnetron sputtering", *Proceedings of AIP Conference* 1665, DOI: 10.1063/1.4917968, 2015, 1-3
17. K. Satyanarayana, N. Ravi, K. Shivaji Babu and A. Venugopal, "Surface integrity and optimization of turning Ti6Al4V", *Proceedings of 5th International and 26th All India Manuf. Technology, Design and Research Conference (AIMTDR-2014)*, 2014, 1-5.

18. P. Shyamala Rao, R. Ramaseshan, F. Jose, S. Dash, A. K. Tyagi and N. Ravi, "Evolution of structural and mechanical properties of TiN films on SS304LN steels", International Journal of Applied Ceramic Technology 10(1) (2013) 45-50.
19. A. Chowdhury, P. Ramavath, P. Biswas, N. Ravi and R. Johnson, " experimental investigation on flowability and compaction behaviour of spray granulated submicron alumina granules", ISRN Ceramics, DOI: 10.1155/2013/264194, 2013, 1-6.
20. N. P. Wasekar, N. Ravi, P. Sureshbabu, L. Ramakrishna and G. Sundararajan, " High cycle fatigue behaviour of microarc oxidation coatings deposited on 6061-T6 Al alloy", Metallurgical and Materials Transactions A 41A (2010) 255-265.
21. P. Panda, R. Ramaseshan, N. Ravi, G. Mangamma, F. Jose, S. Dash, K. Suzuki and H. Suematsu, "Reduction of residual stress in AlN thin films synthesized by magnetron sputtering technique", submitted to Materials Chemistry and Physics, 2017.

Publications in conference proceedings

1. A Materials Awareness Bulletin, "A Special Report on Processing Technologies for Advanced Ceramics and Composites", was published during a seminar on 'Processing Technologies for Advanced Materials', conducted by TIFACLINE/MRSI and DMRL, December 11, 1991 at DMRL, Hyderabad
2. N. Ravi, TRB Sharma and SK Potay , "Materials Database – A Key Factor for Industrial ", presented and published in a 'National Seminar on Computer Control in Metallurgical Industries', April 9-10, 1992 at DMRL, Hyderabad
3. TRB Sharma, N. Ravi, MS Prasad and SK Potay, " Advanced Resource Sharing in Modern Libraries", presented and published in a 'Workshop on Library Automation", September 12, 1992 at DMRL, Hyderabad
4. K. Gopala Krishna, N. Ravi, KP Rao and TP Bagchi, "Production of Sponge Iron Powder from Indian Blue Dust Concentrate", presented and published in 20th PMAI conference, March 3-4, 1994 at INSC, New Delhi
5. D. Srinivasa Rao, D.Sen, K.R.C.Somaraju, S.Ravi Kumar, N.Ravi and G.Sundararajan, "The influence of powder particle velocity and temperature on the property of Cr₃C₂-25NiCr coating obtained by detonation-gun", presented and published in the 15th International Thermal Spraying Conference, Nice, France, 1998.
6. N. Ravi, "Characterization Services at ARCI", presented and published in 'Surface Engineering '99', January 7-8, 1999 at Hyderabad

7. Y.N. Tolmochev, V.L. Bukhovets, I.G. Varshavskaya, and N. Ravi, "Some Peculiarities of Microhardness Testing of Thin DLC Films Deposited on Soft Substrates", presented and published in the Proceedings of 4th International Symposium on Diamond and Related Materials (ISDF-4), Karkov, Ukraine, 1999, p 207-208

Conference Presentations

1. N. Ravi, KP Rao, and TP Bagchi, "Sintered Bronze-Graphite Plate for Electronic Instrumentation", presented in 21st PMAI conference, April 27-28, 1995 at CGCRI, Kolkotta
2. N. Ravi, KP Rao, and TP Bagchi, "Thermal and Erosion Properties of Nickel-Graphite Abradable ", presented in 21st PMAI conference, April 27-28, 1995 at CGCRI, Kolkotta
3. D. Srinivasa Rao, D. Sen, K.R.C. Somaraju, N. Ravi and G. Sundararajan, "Characterisation and Application of Tungsten Carbide-Cobalt(92-8) Coatings Deposited by Electro-Spark Coating Technique", presented in Poster Session of 50th Annual Technical Meeting of IIM, November 14-17, 1996 at New Delhi.
4. D. Srinivasa Rao, D.Sen, K.R.C.Somaraju, N.Ravi, G.Krishna and G.Sundararajan, "Tribological Behaviour of Detonation Gun Coatings", presented at PM-97 International Conference on PM for Automotive Components, February 10-12, 1997 at New Delhi.
5. J. Janardhan Reddy, M. Vijaya Kumar, N. Ravi, TR Ram Mohan, and P. Rama Krishnan, "The Effect of Shear Rate on Viscosity of Powder Injection Moulding Mixes with Low Viscosity Binders", presented at 25th PMAI Conference, March 23-25, 1999, Hyderabad
6. J. Janardhan Reddy, M. Vijaya Kumar, N. Ravi, TR Ram Mohan, and P. Rama Krishnan, "A Simple Correlation of Viscosity of Powder Injection Moulding Mixes with Binder Content/Powder Loading", presented at PMAI Conference, March 23-25,1999, Hyderabad
7. V.L. Bukhovets, I.G. Varshavskaya, N. Ravi, and G. Sundararajan, "Deposition of a-C:H Films on Non-Conducting Substrates by PECVD Techniques", presented at International Conference on Carbon on Science for Materials in the Frontier of Centuries: Advantages and Challenges, 4-8th November 2002, Kiev, Ukrain
8. V.L. Bukhovets, I.G. Varshavskaya, N. Ravi, and G. Sundararajan, "Deposition of a-C:H Films on Non-Conducting Substrates", presented at International Conference on Carbon I: Fundamental Problems of Science, Materials Science, Technology, 17-19th October, 2002, Moscow, Russia

9. N. Ravi, I.G. Varshavskaya, V.L. Bukhovets, and G. Sundararajan, "Deposition of Diamond-like Carbon Films on Aluminium substrates by RF-PECVD Technique: Influence of Process Parameters" , presented during International Conference on Metallurgical Coatings and Thin Films (ICMCTF 2003) held at San Diego, USA between April 28 –May 2, 2003
10. V.L. Bukhovets, I.G. Varshavskaya, N. Ravi, and G. Sundararajan, "Influence of Deposition Parameters on DLC Properties in RF Discharge", presented at International Conference on Carbon II: Fundamental Problems of Science, Materials Science, Technology, 16-18th October, 2003, Moscow, Russia
11. N. Ravi, I.G. Varshavskaya, V.L. Bukhovets, and G. Sundararajan, "Deposition of Diamond-like Carbon Films on Aluminium Substrates by RF-PECVD Technique: Influence of Process Parameters", presented during National Workshop on Thin Films Technologies and Applications held at PSG College of Arts and Science, Coimbatore during the period September 8-9, 2004
12. N. Ravi, R. Markandeya and S. V. Joshi, "Effect of substrate roughness on adhesion and tribological properties of TiN and nanocomposite coatings", presented invited lecture at All India Seminar on "Emerging technologies in Materials Sciences and Engineering", held at Institute of Aeronautical Engineering, Hyderabad, during the period March 18-19, 2014.
13. N. Ravi, R. Markandeya and S. V. Joshi, "Effect of nitrogen pressure on mechanical properties of nc-TiAlN/a-Si₃N₄ nanocomposite coatings deposited by cathodic arc PVD process", presented at Golden Jubilee Science Congress of Andhra Pradesh Academy of Sciences (APAS-GJSC 2014) held at Indian Institute of Chemical Technology, Hyderabad during the period November 13-15, 2014.
14. N. Ravi, R. Markandeya and S. V. Joshi, "Fracture behaviour of nc-TiAlN/a-Si₃N₄ nanocomposite coatings during nanoimpact test" presented at Nanoscience, Nanotechnology and Advanced Materials (NANOS-2015) held at GITAM University, Vishakhapatnam during the period December 14-17, 2015
15. N. Ravi, R. Markandeya and S. V. Joshi, "Effect of nitrogen pressure on mechanical properties of nc-TiAlN/a-Si₃N₄ nanocomposite coatings deposited by cathodic arc PVD process", presented at Conference on Advances in Refractory and Reactive Metals and Alloys (ARRMA-2016) held at Bhabha Atomic Research Centre, Mumbai during the period January 27-29, 2016

Characterization Instruments being handled

| <i>Instrument / Features</i> | <i>150 kN Universal Testing Machine</i> | <i>XRD Residual Stress Analyser</i> | <i>Depth Sensing Micro/Macro Hardness Tester</i> |
|-------------------------------------|---|--|---|
| Make | Instron, UK | Panalytical, The Netherlands | Nanovea, USA |
| Model | 5584 (Electro/mechanical) | Xpert Pro MRD | – |
| Specs. | Max Load: 150kN | Target: Copper | Max. Load: 50 N |
| | XHS: 0.001 to 750 mm/min | 2 θ scan range: 0-160° | |
| | | ψ Angle: -90° to + 90° | |
| | | ϕ Angle: 0°, 45°, 90° | |
| Added facilities | Mechanical extensometer of 25 and 50 mm GL, Video extensometer 200 mm | Glancing incidence (GI) angle | 200 N load cell, 3D professional software for archiving the residual indentations |
| Tests | Uniaxial tensile and compression, 3- and 4-point bending (flexure) | Residual stresses, powder XRD, GI XRD | Vickers, Knoop, Berkovich, and spherical indentation tests |
| Properties evaluated | Tensile and true stress-strain, elastic modulus, yield, compression flexure strength etc. | Phase analysis and residual stresses (by d vs $\sin^2\psi$ technique) in bulk materials and thin films | Hardness and elastic modulus of bulk materials and thick coatings |

Contact information

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