



DR. HIMADRI ROY

PH.D

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Professional Recognition:

BOYSCAST FELLOWSHIP AWARD DST,
Govt. of India , 2011
Reviewer of International Journals
Elsevier, Springer, Taylor and Francis,
Wiley etc. Since 2011

SKILLS

Failure Analysis of Engineering components
Mechanical behaviour of Materials
Characterization of Materials
Semi-Solid Processing of Al alloys

EXPERIENCE

2021-Till Now	Senior Principal Scientist Foundry Group Working on different aspects of Foundry, notably Semi-solid Metal Processing, ADI casting, Material Characterization
2016-2021	Principal Scientist Industrial Services and Research Group Worked on various aspects of Materials Inspection, Quality Assurance, Failure Investigation, Remaining Life Assessment.
2013-2016	Senior Scientist Industrial Services and Research Group Worked on NDT, Fracture Mechanics, Mechanical Behaviour of Materials, Characterization using Electron Microscope etc.
2009-2013	Scientist Industrial Services and Research Group Worked on Fracture Mechanics, Fatigue Behaviour, Acoustic Emission etc.
2006-2009	Junior Scientist Industrial Services and Research Group Worked on Fracture Mechanics, Fatigue Behaviour, Acoustic Emission etc.
2002-2011	BE (Metallurgy, NIT Durgapur, 2002) M.Tech (Metallurgical & Materials Engg., IIT Kharagpur, 2005) Ph.D. (Metallurgical & Materials Engg., IIT Kharagpur, 2011)

List of Publications

1. SK Gautam, H Roy, B Chandrakanth, AK Lohar, SK Samanta. Effect of Processing Parameters of Rheocast on Mechanical Properties of Al–10.5 Si–1.7 Cu Alloy, International Journal of Metalcasting, 36 (1-3), 18-26, 2023.
2. SK Gautam, H Roy, AK Lohar, SK Samanta. Rheological properties of ADC12 Al alloy in the semi-solid state, International Journal of Cast Metals Research, 1-9, 2023.
3. A Datta, A Shrivastava, N Mandal, H Roy, SS Chakraborty. A comparative investigation of butt friction stir welding of aluminium alloys, AA 1100 and AA 7075, with AISI 304 stainless steel, Welding in the World, 1-17, 2023.
4. SA Babalola, S Dutta, H Roy, NC Murmu. Deciphering the interdependent impact of process parameters in friction stir welding-Part I: an overview of the challenges and way forward, Materials and Manufacturing Processes, 1-22, 2023.
5. Sujeet Kumar Gautam, Himadri Roy, Aditya Kumar Lohar, Sudip Kumar Samanta. Studies on Mold Filling Behavior of Al–10.5 Si–1.7 Cu Al Alloy During Rheo Pressure Die Casting System, International Journal of Metalcasting Volume 35, pp: 1–10, 2023.
6. SK Gautam, M Mallik, H Roy, AK Lohar, SK Samanta, Wear and Mechanical Properties of In Situ A356/5% TiB₂ Composite Synthesis by Cooling Slope Technique, International Journal of Metalcasting, 1-13, 2023.
7. C Choudhary, KL Sahoo, H Roy, D Mandal, Effect of Grain Refiner on Microstructural Feature Influence Hardness and Tensile Properties of Al-7Si Alloy, Journal of Materials Engineering and Performance 1-12, 2022.
8. D Ghosh, H Roy, A Saha, C Subramanian, Failure Analysis of Boiler Water Wall Tube: A Case Study from Thermal Power Plant, Journal of Failure Analysis and Prevention 22 (1), 203-208, 2022.
9. T Das, H Roy, AK Lohar, SK Samanta Mechanical and microstructural properties of laser direct energy deposited 15–5 PH and SS 316L stainless steel, Materials Today: Proceedings 66, 3809-3813, 2022
10. M Prudhvi Krishna, Simeon A Babalola, Samik Dutta, Shitanshu Shekhar Chakraborty, Murugan Thangadurai, Himadri Roy, Nilrudra Mandal, Harish Hirani, Poulomi Roy, Effectiveness of different facemask materials to combat transmission of airborne diseases, Sadhana, 46, 119 (1-10), 2021.
11. BK Singh, S Goswami, K Ghosh, H Roy, N Mandal, Performance evaluation of self lubricating CuO added ZTA ceramic inserts in dry turning application, International Journal of Refractory Metals and Hard Materials 98, 105551, 2021.
12. S Basak, P Biswas, S Patra, H Roy, MK Mondal, Effect of TiB₂ and Al₃Ti on the microstructure, mechanical properties and fracture behaviour of near eutectic Al-12.6 Si alloy, Int J Miner Metall Mater 28, 1174-1185, 1-5, 2021.

List of Publications

13. D Ghosh, H Roy, C Subramanian, Metallurgical failure investigation of premature failed platen Water Wall tube in a thermal power plant boiler, Journal of Failure Analysis and Prevention 21, 733-737, 2021.
14. Chidambaram Subramanian, Himadri Roy, Abhishek Kumar, Abhijit Mondal, Subrata Ray, Sanjib Kr De, Debashis Ghosh, Atanu Saha, Failure cause analysis of an expansion bellow of integrated turbine unit, International Journal of Pressure Vessels and Piping 191, 104360, 2021.
15. P Biswas, S Patra, H Roy, CS Tiwary, M Paliwal, MK Mondal, Effect of Mn Addition on the Mechanical Properties of Al-12.6Si Alloy: Role of Al₁₅(MnFe)₃Si₂ Intermetallic and Microstructure Modification, Metals and Materials International 27, 1713-1727, 2021.
16. C Subramanian, H Roy, A Mondal, D Ghosh, SK Laha, KJ Uke, Failure of induced draft-ID fan blade in coal fired boiler, Engineering Failure Analysis 122, 105282, 2021.
17. BK Singh, S Samanta, SS Roy, RR Sahoo, H Roy, N Mandal, Evaluation of mechanical and frictional properties of CuO added MgO/ZTA ceramics, Materials Research Express (IOP), 6 (12), 125208, 2020.
18. M Mallik, S Monia, M Gupta, A Ghosh, MP Toppo, H Roy, Synthesis and characterization of Cu₂O nanoparticles, Journal of Alloys and Compounds 829, 154623, 2020.
19. Vikash Kumar, Ankit Shrivastava, Debapriya Patra Karmakar, Shitanshu Shekhar Chakraborty, Himadri Roy, Muvvala Gopinath, Prakash Kumar, Sumanta Mukherjee, Effect of process parameters on geometrical aspects in direct metal laser deposition of Ni₅Mo₅Al hardface coating, IOP Conference Series: Materials Science and Engineering 561 (1) pp 012063, 2019.
20. BK Singh, D Ghosh, N Mandal, H Roy, Modeling and Predicting Abrasive Wear Behavior of Al-SiCp Composite Using Multi-response Optimization-Based RSM, Journal of The Institution of Engineers (India): Series D, 100 (2), 263-273, 2019.
21. BK Singh, H Roy, B Mondal, SS Roy, N Mandal, Measurement of Chip Morphology and Multi criteria Optimization of Turning Parameters for Machining of AISI 4340 Steel using Y-ZTA Cutting Insert, Measurement 142, 181-194, 2019.
- 22.. S. Mazumder, B.K. Kumar, A. Singh, H Roy, N Mandal, Tribological investigation of MgO/Al₂O₃ ceramic composite with the inclusion of nano CuO in dry abrasive wear test, Materials Research Express (IOP), 6, 085086, 2019.
23. NC Adak, S Chhetri, S Sabarad, H Roy, NC Murmu, P Samanta, T Kuila Direct observation of micro delamination in graphene oxide incorporated carbon fiber/epoxy composite via in-situ tensile test Composites Science and Technology 177, 57-65, 2019.

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24. AR Subhani, DK Mondal, C Mondal, H Roy, J Maity, Development of a high-strength low-carbon steel with reasonable ductility through thermal cycling, *Journal of Materials Engineering and Performance* 28, 2192-2201, 2019.
25. S Dutta, A Karmakar, H Roy, K Barat, Automatic estimation of mechanical properties from fractographs using optimal anisotropic diffusion and Voronoi tessellation, *Measurement* 134, 574-585, 2019.
26. SK Gautam, H Roy, AK Lohar, SK Samanta, G Sutradhar, Microstructure Characterization and Mechanical Properties of Semi Solid ADC12 Al Alloy, *International Journal of Modern Manufacturing Technologies* 11 (1), 36-42, 2019.
27. BK Singh, H Roy, B Mondal, SS Roy, N Mandal, Development and machinability evaluation of MgO doped Y-ZTA ceramic inserts for high-speed machining of steel, *Machining Science and Technology* 22 (6), 899-913, 2018.
28. SK Gautam, N Mandal, H Roy, AK Lohar, SK Samanta, G Sutradhar, Optimization of processing parameters of cooling slope process for semi-solid casting of ADC 12 Al alloy, *Journal of the Brazilian Society of Mechanical Sciences and Engineering*, 40(6), 291,2018.
29. SK Mishra, H Roy, K Dutta, Influence of Ratcheting Strain on Tensile Properties of A356 Alloy, *Materials Today: Proceedings* 5 (5), 12403-12408, 2018.
30. ST Islam, SK Samanta, H Roy, AK Lohar, S Das, A Bandyopadhyay, Rheological Behavior of 316L Stainless Steel Feedstock for μ -MIM, *Materials Today: Proceedings* 5 (2), 8152-8158, 2018.
31. SK Gautam, H Roy, AK Lohar, SK Samanta, G Sutradhar, Effect of processing routes on structure-property relationship of ADC 12 Al alloy, *Materials Research Express* 6 (2), 026518, 2018.
32. D Ghosh, S Das, H Roy, SK Mitra, Oxidation behaviour of nanostructured YSZ plasma sprayed coated Inconel alloy, *Surface Engineering* 34 (1), 22-29, 2018.
33. AJ Banerjee, H Roy, MK Biswal, AK Lohar, H Chattopadhyay, Naga Hanumaiah, Investigation on Tensile Behaviour of Laser Welded Al-Mg-Sc-Zr In Situ TiB₂ Reinforced Metal Matrix Composite, *Transactions of the Indian Institute of Metals* 70, 2071-2077, 2017.
34. Debashis Ghosh, Manab Mallik, Nilrudra Mandal, Samik Dutta, Himadri Roy, Aditya Kumar Lohar, Effect of Experimental Variables of Abrasive Wear on 3D Surface Roughness and Wear Rate of Al-4.5 % Cu Alloy, *Journal of Institution of Engineers (Series: D) (Springer)*, 97(1), 27-36, 2017
35. P Biswas, MK Mondal, H Roy, D Mandal, Microstructural evolution and hardness property of in situ Al-Mg₂Si composites using one-step gravity casting method, *Canadian Metallurgical Quarterly* 56 (3), 340-348, 2017.

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36. SK Mishra, H Roy, AK Mondal, K Dutta, Damage assessment of A356 Al alloy under ratcheting–creep interaction, Metallurgical and Materials Transactions A 48, 2877-2885, 2017
37. A Saha, H Roy, Failure investigation of a secondary super heater tube in a 140 MW thermal power plant, Case studies in engineering failure analysis 8, 57-60, 2017
38. D Ghosh, S Dutta, AK Shukla, H Roy, Failure Investigation of a Cage Suspension Gear Chain used in Coal Mines, Journal of The Institution of Engineers (India): Series D 97 (2), 255-262, 97 (1), 77-84, 2016.
39. N Shukla, H Roy, BK Show, Tribological Behavior of a 0.33% C Dual-Phase Steel with Pre I/C Hardening and Tempering Treatment under Abrasive Wear Condition, Tribology Transactions 59 (4), 593-603, 2016.
40. D Ghosh, H Roy, S Das, SK Mitra, Nanostructured CeO₂ coating for high temperature oxidation protection, Surface Engineering 32 (6), 397-403, 2016.
41. N Shukla, H Roy, BK Show, Effect of prior austempering heat treatment on the microstructure, mechanical properties and high-stress abrasive wear behaviour of a 0.33% C dual-phase steel, Canadian Metallurgical Quarterly 55 (1), 13-22, 2016.
42. H Goyal, Nilrudra Mandal, H Roy, S K Mitra, B Mondal, Multi-Response Optimization for Processing Al-SiCp Composites: An Approach towards Enhancement of Mechanical Properties, Transaction of Indian Institute of Metals (Springer), 68 (3), 453-463, 2015.
43. D Ghosh, S. Ray, H Roy, N Mandal, A K Shukla, High Temperature Graphitization Failure of Primary Super heater Tube, High Temperature Materials and Processes (De Gruyter), 34 (8), 777-781, 2015.
44. P Sharma, H Roy, Mill Scale Corrosion and Prevention in Carbon Steel Heat Exchanger, High Temperature Materials and Processes 34 (6), 571-576, 2015.
45. S Thadela, B Mandal, P Das, H Roy, AK Lohar, SK Samanta, Rheological behavior of semi-solid TiB₂ reinforced Al composite, Transactions of Nonferrous Metals Society of China 25 (9), 2827-2832, 2015.
46. D Ghosh, H Roy, S Ray, AK Shukla, Investigation on failure of a drilling rig mast structure, Journal of Failure Analysis and Prevention 15, 474-479, 2015.
47. D Ghosh, H Roy, SK Mitra, Nanostructured Y₂O₃ plasma coating for high temperature oxidation protection, Journal of Adhesion Science and Technology 29 (10), 954-964, 2015.
48. D Kumar, H Roy, BK Show, Tribological Behavior of an Aluminum Matrix Composite with Al₄SiC₄ Reinforcement under Dry Sliding Condition, Tribology Transactions 58 (3), 518-526, 2015.
49. A Saha, H Roy, AK Shukla, Failure investigation of a final super heater tube in a 140 MW thermal power plant, Journal of Failure Analysis and Prevention 15, 184-189, 2015.

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50. D Ghosh, S Ray, H Roy, AK Shukla, Investigation into cause of high temperature failure of boiler superheater tube, High Temperature Materials and Processes 34 (2), 141-146, 2015
51. D Ghosh, S Ray, A Mandal, H Roy, Failure Investigation of Radiant Platen Superheater Tube of Thermal Power Plant Boiler, High Temperature Materials and Processes 34 (2), 171-175, 2015.
52. S Kumar, P Das, SK Tiwari, MK Mondal, S Bera, H Roy, SK Samanta, Study of Microstructure Evolution during Semi-Solid Processing of an In-Situ Al Alloy Composite, Materials and Manufacturing Processes 30 (3), 356-366, 2015.
53. SK Mishra, H Roy, AK Lohar, SK Samanta, S Tiwari, K Dutta, A comparative assessment of crystallite size and lattice strain in differently cast A356 aluminium alloy, IOP Conference Series: Materials Science and Engineering 75 (1), 012001, 2015.
54. A Mondal, H Roy, D Ghosh, AK Shukla, Metallurgical Failure Analysis of Drum Arching Tube of a 140 MW Thermal Power Plant, Journal of Failure Analysis and Prevention 14, 574-577, 2014
55. U Roy, H Roy, H Daoud, U Glatzel, KK Ray, Fracture toughness and fracture micromechanism in a cast AlCoCrCuFeNi high entropy alloy system, Materials Letters 132, 186-189, 2014.
56. P Sharma, H Roy, Pitting corrosion failure of an AISI stainless steel pointer rod, Engineering Failure Analysis 44, 400-407, 2014.
57. H Roy, P Sharma, D Ghosh, AK Shukla, Corrosion failure of an in-service economizer tube, Journal of Failure Analysis and Prevention 14, 454-458, 2014.
58. D Ghosh, H Roy, A Mondal, Failure investigation of condensate pump shaft, Journal of Failure Analysis and Prevention 14, 450-453, 2014.
59. A Saha, H Roy, AK Shukla, Failure of a Pendent Reheater Tube in a 110 MW Thermal Power Plant, High Temperature Materials and Processes 33 (4), 299-304, 2014.
60. D Ghosh, AK Shukla, H Roy, Nano Structured Plasma Spray Coating for Wear and High Temperature Corrosion Resistance Applications, Journal of The Institution of Engineers (India): Series D 95 (1), 57-64, 2014.
61. K Barat, HN Bar, D Mandal, H Roy, S Sivaprasad, S Tarafder, Low temperature tensile deformation and acoustic emission signal characteristics of AISI 304LN stainless steel, Materials Science and Engineering: A 597, 37-45, 2014.
62. D Ghosh, S Ray, H Roy, Failure investigation of high temperature stud, Journal of Failure Analysis and Prevention 14, 17-20, 2014.
63. S Dutta, K Barat, A Das, SK Das, AK Shukla, H Roy, Characterization of micrographs and fractographs of Cu-strengthened HSLA steel using image texture analysis, Measurement 47, 130-144, 2014.

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64. KK Ray, H Roy, A Ray, K Dutta, S Tarafder, Deformation Fatigue and Fracture vis-à-vis Deformation Induced Martensite in AISI 304LN Stainless Steel, *Advanced Materials Research* 794, 415-428, 2013.
65. SK Samanta, PR Das, AK Lohar, H Roy, S Kumar, AK Chowdhury, A novel approach of manufacturing Nickel Wicks for loop heat pipes using Metal Injection Moulding (MIM), *Sadhana* 38 (2), 281-296, 2013.
66. AK Shukla, P Das, S Dutta, S Ray, H Roy, Failure analysis of a head gear pulley used in coal mines, *Engineering Failure Analysis* 31, Pages 48-58, 2013.
67. M Mallik, S Pan, H Roy, Fracture toughness measurement of hot pressed ZrB₂-MoSi₂ composite, *International Journal of Current Engineering and Technology* 3 (5), 1647-1652, 2013.
68. H Roy, A Ray, K Barat, C Hochmuth, S Sivaprasad, S Tarafder, U Glatzel, KK Ray, Structural variations ahead of crack tip during monotonic and cyclic fracture tests of AISI 304LN stainless steel, *Materials Science and Engineering: A* 561, 88-99, 2012.
69. S Dutta, A Das, K Barat, H Roy, Automatic characterization of fracture surfaces of AISI 304LN stainless steel using image texture analysis, *Measurement* Volume 45, Issue 5, June 2012, Pages 1140-1150, 2012.
70. H Roy, S Sivaprasad, S Tarafder, KK Ray, Cyclic fracture behaviour of 304LN stainless steel under load and displacement control modes, *Fatigue & fracture of engineering materials & structures* 35 (2), 108-113, 2012.
71. N Mandal, H Roy, B Mondal, NC Murmu, SK Mukhopadhyay, Mathematical Modeling of Wear Characteristics of 6061 Al-Alloy-SiCp Composite Using Response Surface Methodology, *Journal of materials engineering and performance* 21 (1), 17-24, 2012.
72. H Roy, D Ghosh, AC Pankaj, AK Shukla, J Basu, A Case Study on the Premature Failure of a Cooling Water Pump Shaft, *Journal for Manufacturing Science and Production* 9 (1-2), 99-106, 2011.
73. H Roy, A Saha, D Ghosh, S Ray, AK Shukla, Failure Analysis of a New Turbine Parting Plane Stud, *Journal of the Mechanical Behavior of Materials* 19 (6), 373-382, 2011.
74. H Roy, D Ghosh, P Roy, A Saha, AK Shukla, J Basu, Failure investigation of Platen Superheater Outlet Header, *Journal for Manufacturing Science and Production* 10 (1), 17-24, 2011.
75. D Ghosh, H Roy, S Ray, AK Shukla, High Temperature Corrosion Failure of a Secondary Superheater Tube in a Thermal Power Plant Boiler, *High Temperature Materials and Processes* 28 (1-2), 109-114 2011.
76. P Das, S Dutta, H Roy, R Jayaganthan, Characterization of Impact Fracture Surfaces under Different Processing Conditions of 7075 Al Alloy using Image Texture Analysis, *Int. J. Technol. Eng. Syst* 2, 143-147 2011.

List of Publications

77. H Roy, HN Bar, S Sivaprasad, S Tarafder, KK Ray, Acoustic emission during monotonic and cyclic fracture toughness tests of 304LN weldments, International Journal of Pressure Vessels and Piping 87 (10), 543-549 2010.
78. A Saha, H Roy, AK Shukla, Investigation into the Probable Cause of Failure of Economizer Tube of a Thermal Power Plant, Journal of Failure Analysis and Prevention 10 (3), 187-190 2010.
79. D Ghosh, H Roy, TK Sahoo, AK Shukla, Failure investigation of platen superheater tube in a 210 MW thermal power plant boiler, Transactions of the Indian Institute of Metals 63 (2), 687-690 2010.
80. H Roy, S Sivaprasad, S Tarafder, KK Ray, Crack tip damage mechanism under monotonic and cyclic loading conditions, Key Engineering Materials 417, 105-108 2010.
81. D Ghosh, H Roy, AK Shukla, Investigation of Probable Cause of Premature Cracking of Downcomer Nozzle of Heat Recovery Steam Generator, Journal of failure analysis and prevention 9 (6), 517-521 2009.
82. S Ghosh, V Kain, A Ray, H Roy, S Sivaprasad, S Tarafder, KK Ray, Deterioration in Fracture Toughness of 304LN Austenitic Stainless Steel Due to Sensitization, Metallurgical and Materials Transactions A 40 (12), 2938-2949 2009.
83. H Roy, S Sivaprasad, S Tarafder, KK Ray, Monotonic vis-à-vis cyclic fracture behaviour of AISI 304LN stainless steel, Engineering Fracture Mechanics 76 (12), 1822-1832 2009.
84. A Saha, H Roy, S Ray, M Maiti, KK Chowdhury, AK Shukla, J Basu, Investigation of probable cause of damage of steam drum of naphtha cracking furnace, Engineering Failure Analysis 16 (5), 1387-1396 2009.
85. SK Mukhopadhyay, H Roy, A Roy, Development of hardness-based model for remaining life assessment of thermally loaded components, International Journal of Pressure Vessels and Piping 86 (4), 246-251 2009.
86. H Roy, D Ghosh, T Sahoo, A Shukla, Failure analysis of a spring for a fuel pump bracket assembly, Indian Journal of Engineering and Materials Sciences 16 (1), 33 2009.
87. AK Shukla, BN Singh, DK Sarkar, BN Das, SN Maity, H Roy, Failure Analysis of a Rear Wall Chock Shield for Longwall Face in Coal Mines, Journal for Manufacturing Science and Production 10 (3-4), 231-238 2009.
88. H Roy, N Parida, S Sivaprasad, S Tarafder, KK Ray, Acoustic emissions during fracture toughness tests of steels exhibiting varying ductility, Materials Science and Engineering: A 486 (1-2), 562-571 2008.

List of Projects

1. Test Certificate Generation for Aero Engine Materials, Forgings by Mechanical Testing., GTRE, DRDO, Govt. of India, 2022-2025, Project cost: Rs. 234 lakhs- Principal Project Leader.
2. Alloy Identification, Hardness Survey and In-situ Metallography of Aero Engine Forgings, GTRE, DRDO, Govt. of India, 2019-2023, Project cost: Rs. 72 lakhs- Co-Project Leader.
3. Development of aeronautical standard, high strength, long endurance casting with Al-7Si-0.3 Mg-0.05Mn-0.05Cu alloy for Aero engine Power transmission box. GTRE, DRDO, Govt. of India, 2019-2023, Project cost: Rs. 298 lakhs- Co-Project Leader
4. Development of self-lubricating nano-composite for wear-resistant applications. DST-Nanomission, Govt. of India, 2017-2021, Project cost: Rs. 81.38 Lakhs, Co-Project Leader.
5. Preliminary Study to develop a fuel housing system for Gas Turbine Engine by Melting and Solidification of Aluminium Base Light Alloy. GTRE, DRDO, Govt. of India, 2017-2020, Project cost: Rs. 95.40 Lakhs, Co-Project Leader.
- 6 . Process Technology For Manufacturing Of ADI Component For Mining Application. CSIR, Govt. of India, 2016-2018, Project cost: Rs. 63 Lakhs, Project Leader.
7. Novel energy effective metallic materials for automotive and general engineering application (LWM). CSIR, Govt. of India, 2012-2017, Project cost: Rs. 100 Lakhs, Co-Project Leader.
8. Rheo Pressure Die Casting of JIS ADC 12 Aluminium alloys. Sona Koyo Steering, Gurgaon, India. 2015-2017, Project Cost: Rs. 26 Lakhs, Co-Project Leader.