BIODATA

Name : Dr.K.Rajendra Udupa

Highest Qualification: Ph.D

Institute	Degree	Year	Specialization
I.I.Sc, Bangalore	Ph.D	1989	Metallurgy
I.I.Sc.,Bangalore	M.E.	1977	Foundry sciences
I.I.Sc, Bangalore	B.E.	1975	Metallurgy
B.C.C. Kundapur	B.Sc.	1972	PCM
B.C.C. Kundapur	PUC.	1969	PCM
Board High School, Koteshwar	S.S.LC.	1968	

PhD thesis : Mechanical Properties of Electroslag Refined En 24 and MDN 250 maraging steel

Abstract – Electro slag refining is carried out in different polarity in DC and AC modes and they are structurally characterized in as cast, forged and heat treated conditions. Inclusion analysis is carried out in various positions of the ingots. Tensile, impact and fracture toughness properties were assessed in corresponding positions of the ingots. Electroslag refining improves the properties because they are capable of removing inclusions of the course variety and precipitate them in fine form. It is also found that second type sulphide inclusions are highly deleterious to fracture toughness properties of steels

M.E. Thesis : Alloying aspects of S.G. Iron

S.G. Iron is produced with different combination of alloying additions. Cast ingots are machined to standard tensile testing samples and given different heat treatments. Micro structural studies are carried out and images are recorded. S.G. iron alloyed with 1.2 Ni, .2 Mo and trace of Cr , hardened and tempered gives the best combination of strength and ductility. Yield point phenomena is noted in many of alloyed and heat treated S.G. iron

B.E. project : Production of Iron Powder by Electrolytic Process using Chloride Bath.

Industrial Experience: Production Engineer in India Pistons Ltd, Chennai 1977 -1982

Teaching Experience: 1982 to till now in NITK Surathkal

Present Position: Professor

RESEARCH AND DEVELOPMENT

Following research projects were carried out:

1. Fatigue and Wear Studies on Austempered Ductile Iron; Sponsored by MHRD, 1989 -92

2. Development of ADI Components; Sponsored, by R & D Centre of IIF Coimbatore, 1992 – 93

3. Development of ADI Ball as Grinding Media material; Sponsored by Staff Research Project, KREC, 1993 -94

4. Studies on the Characteristics of Clay Materials for Tile Industries; Supported by Tile and Brick R & D Centre, KREC, 1944 -45

5. Archaeometallurgicl analysis of Kodachadri Iron Pillar; Supported by Centre of Excellence, KREC, Surathkal, 1977-78

6. Influence of Aging on the Impact Toughness of Nuclear Grade AISI 316L Stainless Steel; Sponsored By BRNS, 1994 – 2003

7. Development of ADI for High Strength and Fracture Toughness; Sponsored by CSIR, 1999 -2004

8. Low Temperature Embrittlement of Nuclear Grade Stainless Steel; MOU with BARC 2006 till date

Research Carried out without Financial Support

1. Studies on Melt Oxidation with Laser as Probe
2. Impression Creep Behaviour of TIG Welded AISI 316L Stainless steel
3. Tribal Iron Making in Coastal Region of Karnataka
4. Development of ADI as Grinding Media Material: influence of Surface coating

Ph.D Guided

1. Impression Creep Behaviour of TIG welded AISI316L Stainless Steel Subjected to Low Temperature Aging : Dr Udaya Prasanna (2010)
2. Studies on the Influence of Grain Refining and Modification on Mechanical and Tribological Properties of Cast, Forged and Heat Treated A356 Alloy: Dr. D.G.Mallapur(1911)
3. Development of ADI as Grinding Media Material in the Ball Mill: Microstructural aspect and Influence of Surface Coating: Dr. Raghavendra Hebbar (to be awarded)

On Going Ph.D Work

1. Friction Stir Surface Modification of Al with Ni and Fe: Microstructural Characterisation and Assessment of Mechanical Properties : Ms Prakriti

2. Corrosion Behavior of TIG Welded AISI 316L Stainless steel in marine condition: Influence of Aging: Kripa

3. Copper coating on aluminium by electrodeposition and dc magnetron sputtering: optimization of process parameters, diffusion treatment for anti-microbial properties: Arun Augustin

4. hot-dip aluminizing of low carbon steel using aluminum-chromium baths : Prasanth Huilogol

M. tech Projects in last three years

1. Indentation creep behaviour of friction stirred Al-Ni composite

2. Studies on Diffusion bonded titanium alloy.

3. Modeling of coal based rotary kiln sponge iron making process.

4. Corrosive behaviour of austempered ductile iron grinding media balls in ore grinding condition

5. Multipass recrystallisation behaviour of thermomechanically processed steel.

6. Effect of tool rotational speed during friction stir processing of Al-Fe alloy on its microstructure and creep behaviour

7. Surface conditioning of fly ash to make it cementitious.

8. Evaluation of arc welding process using degital storage oscilloscope and high speed camera

9. Comparison of corrosion behaviour of ADI grinding media balls with forged En31 steel balls in ground slurry of kudremukh iron ore.

10. Copper coating on mild steel through friction stirring

11. Comparison of the corrosion behaviour of AISI 316L stainless steel with athat of commercial grade stainless steel in chemical plant enviournment

B.Tech. Projects in last three years

1. Feasibility report on putting up a sponge iron plant

2. Studies on the wear behaviour of Al-Si alloy: comparing the cast materials with forged ones.

3. Studies on the indentation creep behaviour of nuclear grade stainless steel

4. Quantification of delta ferrite in AISI 316L stainless steel welds by Monte- Carlo method

5. Pre reduction of manganese ore in ferromanganese production

6. Influence of thermal treatment on micrstructure and properties of cast and modified eutectic Al-Si alloy

7.Indentation creep behaviour of plastically deformed nuclear grade AISI 316L stain less steel

8.Mathematical modeling of coal comsumptions in rotary kiln sponge iron making.

Industrial Experience and training

1. Worked in India Pistons Ltd, Chennai, as production Engineer from 1977 to 1982

2. Undergone training course for two months on welding For Engineers in Welding Research Institute Thiruchirapally,

3. Undergone Practical Training in Indian Aluminium,Belur Mutt, Howrah, Mohindra Sintered Product Poona, VISL Bhadravathi, and HMT Bangalore for two months each during under graduate and graduate courses.

4. Visited more than 60 different industries

Industrial Projects

1. Studies on vertical surface cracks on continuously cast steels – Bhilai Steel Plant

2. Austempering Heat treatment using fluidized bed furnace – Fluidtherm, Chennai

3. Production of High Strength S.G. Iron – Servel, Mangalore

4. Corrosion Problems of AISI 304stainless Steels – MCF, Mangalore

5. Analysis of Locally Available Clay – Tile and Brick R and D Centre

6. Heat audit and thermal efficiency studies of induction furnaces – Lamina Foundries

7. Use of ADI grinding media balls for communities of Kudremukh Iron ores – KIOCL Manglore

8. Prevention of thermal cracks in pig casting boats – Kudremuk iron and Steel ltd Mangalore

9. Production of S.G. iron by in mould process – Lamina Foundries.

Expertise

Fractography, metallography, melting of steel, cast iron and Al alloys, gravity Die Casting, Casting Defects, Weld Failures, Inclusions in Steels, electroslag refining

Papers Published in Journals

1. Metallurgical Characteristics of Electroslag Refinied MDN 250 Maraging Steels: K.R.Udupa, D.H.Sastry, G.N.K.Iyengar, Bull Material Science, Vol 13, No.5, Dec 90
2. Studies on Inclusion Characterisation in Electroslag Refined En24 Steel: K.R.Udupa, S.Subramanian, D.H.Sastry, G.N.K.Iyengar, Material Forum (1993) 17

3. Effect of Microstucture on Fatigue Strength of ADI: P.Shanmugam, P.P.Rao, K.R.Udupa, N.Venkatraman: Journal of Material Science,1994, 29

4. Assessment of Degree of Modification in eutectic Al-Si alloy by NDT Technique: K.N.Prabhu, S.Karanth, K.R.Udupa, Indian Foundry Journal, vol.45, No.9, Sept 1999.

5. A New Heat Flow Parameter for assessment of metal Quenchant Interfacial Heat Transfer: K.N.Prabhu, Angelos, K.R.udupa, Met.News Vol.21, No.1

6. Estimation of embrittlement during aging of AISI 316 stainless Steel TIG Weld : Jagannath Nayak, K.R.Udupa, K.R.Hebar, HVS Nayak, Bull. Of Material Science, Dec. 2004, Vol.Vol.23, No. 6

7. Probing the deterioration of AISI 316 stainless steel welds due to aging and creep by indentation creep test : H.Udayaprasanna and K. Rajendra Udupa, Intl. Jr of Nuclear Engineering and Design(available online) Sept 2011

8. Indentation creep studies to evaluate mechanical properties of stainless steel welds: Special issue on Nuclear Science under Jr of Natural Science, Scientific Research Publishing, USA Oct. 2012

9. Influence of grain refining and modification on microstructure and mechanical properties of cast and forged A356 alloy – a comparative study : D.G. Mallapur, Rajendra Udupa K, Kori S.A. and Rajeshwar S.K., The Journal of Manufacturing and Industrial Engineering, Vol.10(4),2011, 21-25

10. Development of layered Zn-Fe coating for better corrosion protection: Ramesh Bhat S., Rajendra Udupa K.,and Chittaranjan HegdeA., Jr of Metals Materials nd Minerals, Vol20, No,22010 pp43-51

11. Investigation into creep behaviour of Sn-40% Pb using impression creep method: H.Udayaprasanna, K.Rajendra Udupa, and K.N.Prabhu Jr. of Inst. of Engieers(India),vol.90, Apr.2009, pp12-15

12. Development of austempered ductile iron for high tensile and fracture toughness by two step austempering process. Ravishankar. K.S., Rajendra Udupa K.,and Prasad Rao P., Indian Foundry Jr.,vol.54,No.4, Apr.2008, pp37-44 (**Best technical paper award)**

13. Microbial effect on heat treated 316 L weldment oin marine water, Kripa M Suvarna., Rajendra UdupaK., Surendranathan A.O., Advanced Material Research., Vol.794, 2013, pp606-607

14. Corrosion studies on 316L fusion zone and base metal in natural sea water by weight loss method, Kripa M Suvarna., Rajendra Udupa K., Surendranathan A.O. Jr. Materllurgical and Materials Science, Vol.55 No.2 Apr.-Jan.,2013

15. Influence of grain refining and modification on microstructure and mechanical properties of cast and forged A356 alloy - A comparative study: D. G. Mallapur, K. Rajendra Udupa, S. A. Kori and Rajeshwar. S. Kadadevarmath, Journal of Manufacturing and Industrial Engineering, Vol. 10(4), 2011, 21-25.

16. Influence of Ti, B and Sr on the tribological properties of forged A356 alloy, D. G. Mallapur, K. Rajendra Udupa, S. A. Kori and R. V. Kurahatti Canadian Metallurgical Quarterly, paper under review (CMQ-184).

Conference papers

1.Use of Factorial experiments in foundry sand quality control, prabhu K.N., Peter Fernadese and Rajendra Udupa K. Proceeding of 6th Asian Foundry Congress Jan. 1999pp 34-38 (**Best Paper award**)

2. New thermal analysis parameter for the assessment of degree of modification in Al-Si alloy,: Narayan PrabhuK., Shivaprasad Karanth, and Rajendra UdupaK., Materials Cong. ,Cirencester, U.K.12-14 Apr. 2000

3. Studies on use of austempered ductile iron as grinding media ball material for grinding of coal.: Jaysimha, Rao K.R.V., Srinivasa Rao, Bhat K.L. and Rajendra UdupaK, Proc. of Int. Sem. on Mineral processing tech VolI 2002, I.I.Sc, Bangalore.

4. Studies on oxidation of molten Al-Si alloy using laser as the probe: Rajendra Udupa, Chatterjee, M S and T conf., Sept. 16-20 , 2007, Detroit USA.

5. Investigation into creep behaviour of Al-Mg(SiC)p composite: Udaya prasanna H., Rajendra UdupaK., Int., Conf. on Electromechanical system AEC Bhatkal Oct. 22-23 2008

6. Suitability of heat treated spheroidal graphite iron as a grinding media ball: Raghavendra H.,Bhat K.L., Rajendra UdupaK., Nat. Sem. on Synergy in mineral sector for sustainable Development. NITK Surathkal, Oct. 4-5, 2008

7.Investigation into wearbehaviour of S.G. iron balls austempered at different temperatures, Raghavendra H. Bhat K.L., Rajendra UdupaK., Int. Sem. NMD-ATM, Kolkota Dec.14-17 2009

8. Investigation into wear behaviour of ADI as grinding media balls: Raghavendra H. Bhat K.L.Rajendra UdupaK. Int. Con. on Advances in theory of iron making and steel making, I.I.Sc Bangalore, 9-11 Dec. 2009

9. Comparison of Creep rates of a selected Aluminium Composite with AISI 316 L Stainless Steel through Indentation creep Test methodology: H.Udaya prasanna, K.R.Udupa (2010), Proceedings of National conference on " Modern trends in Mechanical Engineering-2010", Mysore, India, 24-25th September 2010

10. Probing the deterioration of 316L Stainless Steel Welds due to Ageing and Creep by Indentation Creep tests: Udayaprasanna, K.R.Udupa (2011),Elsevier International Journal of Nuclear Engineering and Design, Available On-line since September 2011

11. Corrosion studies on 316Lin different aqueous media, Kripa m Suvarna Rajendra Udupa K., Surendranathan Int. Con. ASMP2012, I.I.T Madras.

12.Comparison of Creep Rates of AA5356 Alloy Based Aluminium Silicon Carbide Composite and AISI 316L Stainless Steel by Indentation Creep Tests: H.Udayaprasanna , K.R.Udupa, Satyapal Hegde (2012) Journal of Structural Engineering, CSIR, Chennai, Vol.39, No.4 (Oct-Nov Edition). (available on-line October '12 onwards)

13. Microbial effect on heat treated 316 weldment in marine water, Kripa M Suvarna, Rajendra UdupaK. And Surendranathan, Con. on stainless steel centenary Symp. 2013 I.I.T. Bombay.

Courses Taught

1. Thermodynamics of solids
2. Metallurgical Thermodynamics
3. Mechanical Behaviour and Testing of Metals
4. Materials characterisation
5. Basic Materials Science
6. Foundry Technology
7. Advanced Welding Technology
8. Fuels, Furnaces and Refractories
9. Powder Metallurgy
10. Secondary refining of steels
11. Steels and their Heat treatment

Research Interactions

1. Achieving thermal barrier coating using the laser technic, With Prof. Pal Molian, Iowa State University, USA
2. Electroslag welding of maraging steels, with Prof Vishakrev, Iron and Steel Institute, Mascow
3. Corrsion of electronic materials with Prof Rajan Ambat, Royal Institute of Science and Technology, Copenhagan, Denmark.

Administrative responsibilities

1. Worked as hostel warden for four years

2. Worked as member of BOG for two years

3. Worked as HOD for four years

4. Worked as Guest house in charge for two years

5. Coordinator of Centre for Innovation

6. Member of Grievance Committee

7. Presently, Chief Vigilance officer of the Institute

Present interest

1. Effect of automation on society
2. Welding of stainless and its mechanical properties and corrsion behaviour in marine condition
3. Austempered Ductile iron as grinding media ball
4. Refining of steels
5. Science, technology and rationality
6. Casting and welding