



Expert Retention Requires Written Agreement



CURRICULUM VITAE

Nikhil Kar, Ph.D. P.E.²

Principal Metallurgical / Materials Engineer, MT 1982

Principal Mechanical Engineer, M36943



KARS' ADVANCED MATERIALS, INC.

2528 W. Woodland Dr.

Anaheim, CA 92801

714-527-7100 ■ nikhil.kar@karslab.com

www.karslab.com

EDUCATION

Ph.D., Mechanical Engineering – Focus in Mechanics of Materials

University of Southern California, Los Angeles, CA

Masters of Science, Mechanical Engineering – Focus in Thermal Sciences

University of Southern California, Los Angeles, CA

Bachelors of Science (Cum Laude), Mechanical Engineering

University of California, Irvine CA

DEPOSITION AND TRIAL EXPERIENCE

- Warren vs. Kaiser, July 2015 Deposition and Binding Arbitration
- Pimientos vs. Poly-Ag / Politiv, February- May 2016 Deposition and Trial
- Aviles vs. Greenbrier / Dollar Tree Inc: Deposition taken in April 2017
- FSS vs. Viking Corporation: Deposition taken May 2017
- Becerra vs. ITW: Deposition taken March 2019

TEACHING AND RESEARCH EXPERIENCE

- University of Southern California – Faculty Lecturer: Failure Analysis of Materials Fall 2014
- University of Southern California – Faculty Lecturer: Strength of Materials Fall 2016
- Kars' Academy – Metallurgical / Materials Science PE Review Course 2016 - 2019
- University of Southern California – Faculty Lecturer: Failure Analysis of Materials Spring 2017
- University of Southern California – Faculty Lecturer: Strength of Materials Fall 2017
- University of Southern California – Faculty Lecturer: Failure Analysis of Materials Spring 2019

WORK EXPERIENCE

Principal Mechanical and Metallurgical Engineer

Kars' Advanced Materials (www.karslab.com)

September 2013-Present

- Registered Professional Mechanical and Metallurgical/Materials Engineer in the State of California
- Failure Analysis Inspection investigations related to litigation and insurance claim matters
- Failure Analysis Investigation Lead: Worked on over 200 claims and failure analysis investigations
- Root cause analysis
- Microscopic examination of failed surfaces
- Finite Element Analysis for Stress / Strain distribution
- Mechanical Testing / Materials Characterization
- Performed Fractography analysis, SEM and light microscopy for failure analysis investigations
- Advised on failure modes and stress states for specific investigations
- Computed Tomography and X-Ray evaluation of failed electrical components

Composites Research Manager: Materia Inc., (www.materia-inc.com) September 2012- September 2013

- Presently (2013 onward) have a continued relationship as a research consultant for materials development
- Managed research activities related to Proxima/ pDCPD resin systems for use in windblade, oil and gas applications
- Mechanical test method development for composites and neat polymer systems
- Implemented abrasion testing capabilities and orchestrated purchases of thermal analysis equipment
- Designed experiments related to high temperature aging in wet and dry environments to understand property retention of polymers
- Part of management team used to commercialize Proxima Polymers for various applications

RESEARCH EXPERIENCE

Graduate Research Assistant: McGill Composites Center at USC (composites.usc.edu) 2007-2012

- Performed independent research on the mechanical behavior and failure mechanisms of polymer composites used in reinforced conductors
- Utilized different failure characterization techniques including light microscopy, scanning electron microscopy, acoustic emission, high speed video capture, and digital image correlation
- Expert in use of mechanical test machines- Impact, fatigue, high temperature, static loading.
- Used high temperature environmental chambers to perform long term creep tests
- Simulation work utilizing commercial finite element software (SolidWorks, Abaqus)

Undergraduate Research: UCI Combustion Laboratory 2005-2006

- Assisted a PhD student in flow measurement and analysis of microturbine fuel injectors which demonstrated the capability to run on alternative fuel systems

TECHNICAL SKILLS

- Failure Analysis
- Photographic Documentation
- X-Ray Radiography
- SolidWorks, CAD, Volume Graphics
- Proficient in use of mechanical test machines
- Light microscopy
- Scanning electron microscopy (JEOL 6610, JSM 7001F)
- Spectroscopy – FTIR & Micro-Raman
- X-ray Fluorescence
- Metallography: polishing and mounting SEM samples
- Machine Shop use of mill, lathe, cutting and drilling tools

PUBLICATIONS

10. **Kar NK**, Adam Bovie. Failure Analysis of a Composite Rudder Stock using 3D X-Ray Microcomputed Tomography. *Journal of Failure Analysis and Prevention* (2019) Accepted.

9. **Kar NK**, Hu Y, Grunenfelder L. Metallurgical and Materials PE Exam Solved Problems. PPI Publications, 2017.

8. **Kar N.K.**, Roig T, Kar J, Hu Y. Failure Analysis of a Ti6Al4V used in a RASL Procedure. *Journal of Failure Analysis and Prevention*. (2016) Accepted.

7. **Kar N.K.**, Hu Y., Kar N, Kar R. Failure Analysis of a Polymer Centrifugal Impeller. *Case Studies in Engineering Failure Analysis*. (2015) Accepted.

6. Y. Hu, **N.K. Kar**, S. Nutt. Transverse Compression Failure of Unidirectional Composites. *Journal of Polymer Composites* (2014) accepted.

5. L. Jin, B. Jin, **N.K. Kar**, S. Nutt, B. Sun, and B. Gu. Tension-tension fatigue behavior of layer-to-layer 3-D angle-interlock woven composites *Mater Chem & Phys* 1-8 (2013)

4. **N.K. Kar**, Y. Hu, B. Ahn, S.R. Nutt. Diametral compression of pultruded composite rods. *Composites Science and Technology*: 2012

3. E. Barjasteh, **N.K Kar**, S.R. Nutt. Effect of filler on thermal aging of composites for next-generation power lines. Composites Part A: 2011; 42(12):1873-1882
2. **N.K. Kar**, Y. Hu, E. Barjasteh, S.R. Nutt. Tension-tension fatigue of hybrid composite rods. Composites Part B: 2012
1. **N.K. Kar**, E. Barjasteh, Y. Hu, S.R. Nutt. Bending fatigue of hybrid composite rods. Composites Part A: 2011; 42(3): 328-336.

SERVICE AND ACTIVITIES

Member of Failure Analysis Society

Registered Professional Mechanical and Metallurgical Engineer in the State of California

Member of Associated Society of Metals (ASM)

Member of American Society for Testing and Materials (ASTM)

Member of Associated Society of Mechanical Engineers (ASME)