

**James G. Rice, Ph.D.**  
**Curriculum Vitae**

**Contact Information**

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**Professional Summary**

Dr. Rice has over 35 years of technical and managerial experience in both industry and academia. He has a strong technical background in broad areas of mechanical engineering ranging from fluid mechanics and heat transfer to basic design. Dr. Rice's primary expertise is in computational methods and simulation in mechanical engineering. His mechanical engineering practice has focused in particular on the development and application of these methods to a diverse range of applications in industry, and has also used these methods in his litigation support activities.

Dr. Rice has extensive experience as an expert witness in patent litigation involving issues in Mechanical Engineering. Over the last ten years, he has provided litigation support in more than 50 cases including approximately 40 patent cases. This experience has included the preparation of numerous expert reports, depositions, and trial testimony for both plaintiff and defense attorneys. His litigation support activities have also included testing and analysis as required to support his opinions.

Dr. Rice is the author of over 30 technical publications and has consulted for over fifty companies. He has conducted over 200 seminars and short courses in the U.S., Europe, and the Orient, and has been an invited speaker at international engineering conferences.

**Expertise**

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|-------------------------|----------------------|
| ▪ Computational Methods | ▪ Combustion         |
| ▪ Heat Transfer         | ▪ Solid Mechanics    |
| ▪ Thermodynamics        | ▪ Mechanical Design  |
| ▪ Thermal Sciences      | ▪ CAE & CAD Software |
| ▪ Fluid Dynamics        |                      |

**Education**

1978	Virginia Polytechnic Institute & State University, Blacksburg, VA
1973	Virginia Polytechnic Institute & State University, Blacksburg, VA
1972	Old Dominion University, Norfolk, VA

Ph.D.  
MSME  
BSME

**Case**  
**IGB v. Gentherm**  
**IPR2014-00666**

**Exhibit**  
**2002**  
**Gentherm**

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**Professional Experience**

From: 2001  
To: Present  
Organization: MechExpert  
Title: President  
Summary: Consulting and contract engineering activities in the areas of engineering analysis and design, patent litigation, patent development, and software development for both engineering and business applications.

From: 2000  
To: 2001  
Organization: Synetech Group, Charlottesville, VA.  
Title: Vice President & Chief Technical Officer  
Summary: Information technology company. Developed presidential campaign financial software including web based reporting for the 2000 presidential campaign. The company handled all campaign contributions nationwide. Extensive database development for both desktop and web based applications.

From: 1998  
To: 2000  
Organization: Virginia Commonwealth University, Richmond, VA  
Title: Adjunct Associate Professor, Department of Mechanical Engineering  
Summary: Teaching undergraduate courses in thermodynamics, computational methods, thermal systems design, and computer aided engineering, and computer programming. Instrumental in acquisition of CAE and CAD software for use in the development of the undergraduate program.

From: 1995  
To: 1998  
Organization: Altair Engineering, Dearborn, MI.  
Title: Engineering Manager  
Summary: Responsible for overall management of engineering service activities involving computational fluid mechanics, heat transfer, and injection molding. Responsibilities included business development as well as the technical management of projects.

From: 1992  
To: 1995  
Organization: Neural Research, Inc., Charlottesville, VA.  
Title: President & Founder  
Summary: Company was involved in the development and application of neural networks, wavelet based methods, and multi-resolution analysis methods. Applications of these methods were in both engineering and financial analysis.

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From: 1987  
To: 1992  
Organization: Compuflo, Inc., Charlottesville, VA.  
Title: Co-Founder, Executive Vice President & Chief Technical Officer  
Summary: Chief Technical Officer and co-founder of the company as well as developer of the FLOTRAN finite element based computational fluid dynamics analysis software. Primary responsibilities included directing the engineering consulting and service activities, providing technical support to marketing and sales operations, and the overall technical direction for the company.

From: 1981  
To: 1987  
Organization: University of Virginia, Department of Mechanical and Aerospace Engineering, Charlottesville, VA.  
Title: Assistant Professor  
Summary: Teaching graduate and undergraduate courses primarily in the areas of heat transfer, fluid mechanics, thermodynamics, and combustion. Also taught courses in computer programming, computational methods, and computer aided engineering. Active participant in the Center for Computer Aided Engineering and taught extensively in the graduate extension program for industry.

From: 1977  
To: 1981  
Organization: Babcock & Wilcox Company Alliance Research Center, Alliance, OH.  
Title: Group Supervisor, 1979-1981, Senior Research Engineer, 1977-1979  
Summary: Group Supervisor for a software development group. The group developed computational methods for a variety of applications involving computational methods for fluid flow, heat transfer, and combustion in both the fossil and nuclear power industries.

From: 1974  
To: 1977  
Organization: Virginia Polytechnic Institute & State University  
Title: Instructor, Mechanical Engineering Department, Blacksburg, VA  
Summary: Primary responsibilities involved teaching undergraduate courses in the thermal sciences; fluid mechanics, heat transfer, and thermodynamics. Also taught the Mechanical Engineering Instrumentation and Measurements Laboratory.

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**Professional Affiliations, Achievements & Awards**

- Member, American Institute of Aeronautics and Astronautics
- Member, American Society of Mechanical Engineers
  - Vice-chairman, Regional Section, 1984-1985
  - Chairman, Regional Section, 1985-1987
- Member, IEEE, Institute of Electrical and Electronics Engineers
- Pi Tau Sigma
- Sigma Xi
- Best Paper: Fifth IEEE Semi-Conductor Thermal and Temperature Measurement Symposium, February 1989

**Clientele**

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|--------------------------------|-------------------------------------|
| ▪ Advanced Micro Devices       | ▪ Hahn Loeser & Parks LLP           |
| ▪ Altair Engineering           | ▪ Haynes and Boone                  |
| ▪ AMP, Inc.                    | ▪ Kennedy Covington                 |
| ▪ Babcock & Wilcox Co.         | ▪ Kinne IP Group                    |
| ▪ Baker & McKenzie, LLP        | ▪ Kirkland & Ellis                  |
| ▪ Baker & Hostetler, LLP       | ▪ Knobbe Martens Olsen & Bear LLP   |
| ▪ Black and Decker             | ▪ Kobe Steel                        |
| ▪ Boeing Vertol                | ▪ Korean Inst. of Science and Tech. |
| ▪ Bond, Schoeneck & Kibng      | ▪ Kubicki Draper                    |
| ▪ Brown Raysman                | ▪ Loewinsohn Flegle Deary LLP       |
| ▪ Carr & Ferrell               | ▪ Macrosonics                       |
| ▪ CFD Research Corp.           | ▪ McKool Smith                      |
| ▪ Cray Research                | ▪ NASA Langley Research Center      |
| ▪ Christopher & Weisberg, P.A. | ▪ NASA Lewis Research Center        |
| ▪ Chung & Press, P.C.          | ▪ Nissan                            |
| ▪ Daimler Benz                 | ▪ Oliff & Berridge                  |
| ▪ Delphi                       | ▪ Pelerin Milnor                    |
| ▪ Doyle Berman Murdy, P.C.     | ▪ Philips Electronics               |

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| ▪ U.S. Department of Energy                                | ▪ Seagate Storage Technology           |
| ▪ Electric Power Research Inst.                            | ▪ Siemens Automotive                   |
| ▪ Factor & Lake  | ▪ Sonnenschein Nath and Rosenthal, LLP |
| ▪ Federal Mogul  | ▪ Storm LLP                            |
| ▪ Ford Motor Company                                       | ▪ Squire, Sanders & Dempsey LLP        |
| ▪ Fujitsu  | ▪ Toyota                               |
| ▪ General Motors   | ▪ Verizon                              |
| ▪ Hyundai Motor Company                                    | ▪ Westinghouse                         |
| ▪ Fellers, Snider, Blankenship<br>Bailey and Tippens, P.C. | ▪ Wilkie, Farr, & Gallagher            |
| ▪ Friedman, Suder & Cooke                                  | ▪ Whirlpool/KitchenAid                 |

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## **Publications**

1. Lange, Richard J., Rita J. Schnipke, and James G. Rice, "On Thermal Stratification and Migration in Pipe Flow," ASME Winter Annual Meeting, November 1990.
2. Schnipke, Rita J., James D. Haywood, and James G. Rice, "A Fluid Flow and Heat Transfer Analysis for Evaluating The effectiveness of an IC Package Heat Sink," Proceedings: Fifth IEEE Semiconductor Thermal and Temperature Measurement Symposium, Vol. 1, No. 1, February 1989
3. Jones, John H., Rita J. Schnipke, and James G. Rice, "FLOW-2D: A Two Dimensional Finite Element Free and Forced Convection PC Computer Code," ASME Paper No. WA/FE, ASME Winter Annual Meeting, November, 1988.
4. Bulsaro, A. B., M. K. Orazem, and James G. Rice, "The Influence of Axial Diffusion on Convective Heat and Mass Transfer in a Horizontal CVD Reactor," Journal of Crystal Growth, 1988.
5. Rice, James G., Rita J. Schnipke, D. Kim Cornelius, and Michael D. Normansell, "Navier-Stokes Computation of a Typical High-Lift Airfoil System," Science and Engineering on Cray Supercomputers, Proceedings of the Fourth International Symposium, Minneapolis, Minnesota, October, 1988.
6. Farnsworth, D. A., and James G. Rice, "Improved Solution Methods for Strongly Coupled Thermal/Hydraulic Analysis," Nuclear Engineering and Design, Vol. 102, 1987.
7. Schnipke, R. J. and James G. Rice, "Finite Element Analysis of Forced and Natural Convection Heat Transfer," International Journal for Numerical Methods in Engineering, Vol. 24, p. 117-128 (1987).
8. Rice, James G., and R. J. Schnipke, "An Equal Order Pressure Solution Method that Does Not Exhibit Spurious Pressure Modes," Computer Methods in Applied Mechanics and Engineering, No. 58 (1986), p. 135.
9. Schnipke, R. J., James G. Rice, and R. D. Flack, "Finite Element Analysis of Viscous Flow in a Vaned Radial Diffuser," International Journal of Heat and Fluid Flow, 1986
10. Brownell, R. B., R. D. Flack, M. C. Davis, and James G. Rice, "Finite Element Analysis of Viscous Flow in a Vaned Radial Diffuser," International Journal of Heat and Fluid Flow, 1986.

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11. Rosen, M. C., P. E. Allaire, and James G. Rice, "Penalty Function Finite Element Analysis of Steady Incompressible Flow in Rotating Coordinates," ASME Paper No. 84-GT-36, ASME International Gas Turbine Conference, Belgium, 1984
  12. Hassan, Y. A., James G. Rice, and J. H. Kim, "A Stable Three Dimensional Streamline Upwind Scheme," Proceedings: 12th Southeastern Conference on Theoretical and applied Mechanics, Pine Mountain, Georgia, 1984
  13. Hassan, Y. A., James G. Rice, and J. H. Kim, "Three Dimensional Transient and Steady State Calculations for Pressurized Thermal Shock Mixing Experiments," Multi-Dimensional Fluid Transients, ASME Book No. G00273, 1984.
  14. Hassan, Y. A., James G. Rice, and J. H. Kim, "An Improved Multi-Dimensional Finite Difference Scheme for Predicting Horizontal Pipe Flow," Nuclear Technology, Vol. 65, No. 3 (1984), p. 454
  15. Hassan, Y. A., James G. Rice, and J. H. Kim, "Reduction of Numerical Diffusion Errors in Thermal Mixing Problems," Transactions of the American Nuclear Society, Vol. 45, November 1983.
  16. Hassan, Y. A., James G. Rice, and J. H. Kim, "Cause and Cure of Stability Problems in the Skew Upwind Differencing Scheme," Transactions of the American Nuclear Society, Vol. 45, November 1983.
  17. Hassan, Y. A., James G. Rice, and J. H. Kim, "A New Scheme for Predicting Three Dimensional Temperatures in the Pressurized Thermal Shock Problem," Transactions of the American Nuclear Society, Vol. 46, June 1984.
  18. Schnipke, R. J. and James G. Rice, "Application of a New finite Element Method to Convection Heat Transfer," Proceedings: Fourth International Conference on Numerical Methods in Thermal Problems, Pineridge Press, 1985
  19. Rice, James G. and R. J. Schnipke, "An Efficient Finite Element Method for the Analysis of Viscous Fluid Flow," Proceedings: Fourth International Conference on Numerical Methods in Laminar and Turbulent Flows, Pineridge Press, 1985
  20. Rice, James G. and R. J. Schnipke, "A Monotone Streamline Upwind Finite Element Method for Convection Dominated Flows," Computer Methods in Applied Mechanics and Engineering, No. 48 (1985), p. 313.
  21. Allaire, P. E., M. C. Rosen, and James G. Rice, "Finite Element Analysis of Viscous Incompressible Flow with a Penalty Function Formulation," Finite Elements in Analysis and Design, Vol. 1, No. 1 (1985).
  22. Schnipke, R. J. and James G. Rice, "Examination of a New Finite Element Method Applied to Convection Heat Transfer," Finite Elements in Analysis and Design, Vol. 1, No. 3 (1985).
  23. Hassan, Y. A., James G. Rice, and J. H. Kim, "Predictions of Horizontal Stratified Pipe Flow," ASME Paper No. 83-WA/HT-41, ASME Winter Annual Meeting, Boston, MA, 1983.
  24. Hassan, Y. A., James G. Rice, and J. H. Kim, "A Stable Mass-Flow Weighted Two Dimensional Skew Upwind Scheme," Numerical Heat Transfer, Vol. 6, No. 4 (1983), p. 153.
  25. Rice, James G., Hassan, Y. A. and J. H. Kim, "Comparison of Measured and Predicted Thermal Mixing Tests Using Improved Finite Difference Techniques," Nuclear Engineering and Design, Vol.76, No 2, 1983, p. 153.
  26. Rice, James G., "Are Our Thermal Science Courses Up to Date," Proceedings of the 1982 ASEE Conference, Texas A&M University, 1982.
  27. Sharma, M. P., James G. Rice, D. K. Cornelius, and D. R. Dougan, "Numerical Computation of Swirling Gas-Particle Flows: Application to Pulverized Coal Classifiers," Paper No. 80-WA/HT-31, ASME Winter Annual Meeting, July 1980.

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28. Overjohn, W. A., S. V. Patankar, and James G. Rice, "THEDA: A Three Dimensional Analysis for Once-through Nuclear Steam Generators," Chemical Engineering Progress Symposium Series, 19th National Heat Transfer Conference, 1979.
  29. Rice, James G., "Experimental and Predicted Performance for the Combustion of a Low Heating Value Gas in a Swirl Burner," PhD Dissertation, Virginia Polytechnic Institute And State University, Blacksburg, Virginia, September, 1978.
  30. Rice, James G., J. R. Grant, and W. C. Thomas, "An Experimental Study of Combustion of a Low Heating Value Gas in a Swirl Burner," Combustion Institute, Central States Section, NASA Lewis Research Center, Cleveland, Ohio, March, 1977.
  31. Rice, James G., "The Modeling of Nitric Oxide Formation in a Swirl Burner with Flue Gas Recirculation," Masters Thesis, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, September, 1973.