

**Ming Wu, Ph.D., P.E.**  
**Principal Engineer**

**Professional Profile**

Dr. Ming Wu is a Principal Engineer in Exponent's Mechanical Engineering practice. Dr. Wu's areas of specialization include mechanical system design; experimental, analytical, and numerical stress analyses; mechanical testing; instrumentation and data acquisition; fracture mechanics and mathematical modeling of fatigue processes; macroscopic and microscopic failure analyses; and mechanical metallurgy, microstructure, and compositional analyses. He has extensive experience with the finite element analysis method, including static stress analysis, thermal stress, creep and fatigue analysis, modal analysis, and transient dynamic analysis with both linear and nonlinear material behavior as well as geometric nonlinearities. Dr. Wu also has expertise in the mechanical testing, characterizing, and modeling composite materials.

Dr. Wu has many years of experience working on analysis and failure investigations of implantable biomedical devices. He has helped clients design, test, and evaluate medical devices, as well as providing consultation on the issues related to the regulatory requirements. Dr. Wu has also worked with large computer and consumer electronic device companies, conducting design review and optimization; prototype and reliability testing; material selection and evaluation including welding, material processing, heat treatment, adhesives, creep, chemical compatibility, corrosion, and aging; human factor study and product risk and reliability assessment; and providing failure analysis support.

Dr. Wu has conducted numerous investigations on the causes of failures initiated by rechargeable batteries in consumer products such as laptops, cell phones, MP3 players, and toys. In addition, he has worked with various consumer electronics companies and battery manufacturers to provide design and process review, characterization, and testing of the Li-ion batteries for safety and reliability.

Prior to joining Exponent, Dr. Wu was an Adjunct Professor and an R&D Engineer at Tennessee Technological University.

**Academic Credentials and Professional Honors**

Ph.D., Mechanical Engineering, Tennessee Technological University, 1994  
M.S., Mechanical Engineering, Tennessee Technological University, 1989  
B.S., Mechanical Engineering, Nanjing Institute of Technology, 1984

Sigma Xi; Phi Kappa Phi; Tau Beta Pi; Pi Tau Sigma  
Stanford University, Mechanical Engineering Department, Guest Lecturer

## **Licenses and Certifications**

Registered Professional Mechanical Engineer, California, #31085

## **Selected Publications**

Mikolajczak C, Hayes T, Megerle M, Wu M. A scientific methodology for investigation of a lithium ion battery failure. IEEE Portable 2007 International Conference on Portable Information Devices, IEEE No. 1-4244-1039-8/07, Orlando, FL, March 2007.

Huet R, Wu M. LCD display strength: Why edge preparation matters. IEEE Portable International Conference on Portable Information Devices, IEEE No. 1-4244-1039-8/07, Orlando, FL, March 2007

Foulds JR, Wu M, Jewett CW, Srivastav S. Fracture and tensile properties of ASTM Cross-Comparison Exercise A 533B Steel by small punch testing. ASTM Special Technical Publication 1329: Small Specimen Test Techniques, Corwin et al. (eds), ASTM, Philadelphia, PA, 1998.

Wu M, Wilson DA. Residual strength prediction of center notched unstiffened fiber/metal laminate panels through the R-curve approach. ASTM Special Technical Publication (STP 1285), American Society for Testing and Materials, 1995.

Wu M, Reddy SV, Wilson DA. Design and testing of Z-shaped stringer stiffened panels—Evaluation of ARALL, GLARE, and 2090 Materials. ASTM Special Technical Publication (STP 1285), 6<sup>th</sup> Symposium on Composites: Fatigue and Fracture, Denver, CO, May 1995.

Wu M, Stone D, Wilson DA. Formability of Beta 21S titanium. MCTR-0695-03, Manufacturing Center, Tennessee Technological University, June 1995.

## **Selected Presentations and Published Abstracts**

Wu M, Reddy SV, Wilson DA. Fatigue and residual strength investigation of ARALL-3 and GLARE-2 panels with bonded stringers. NASA Conference Publication 3274, NASA/FAA International Symposium on Advanced Structural Integrity Methods for Airframe Durability and Damage, Hampton, VA, May 1994.

Wu M, Holland BW, Wilson DA. Translaminar fracture of advanced composite. American Society for Testing and Materials, Composites D-30 Committee, February 1993.

## **Selected Reports**

Wu M, McGoran B, Foulds J. Structural integrity evaluation of the United Kingdom infrared telescope mirror and encoder lifting devices. Report SF26618/COFO/9903/UKIRT, Exponent Failure Analysis Associates, Inc., March 1999.

Foulds JR, Wu M, Jewett CW. Evaluation of the small punch test for nuclear reactor vessel steel embrittlement. Electric Power Research Institute, Report TR-111116, Exponent Failure Analysis Associates, Inc., October 1998.

Wu M, James B, Sprague J. Failure investigation of ovonic stepped roller shaft. DT51801.000/00B/9806/RMW3, Exponent Failure Analysis Associates, Inc., June 1998.

Caligiuri RD, Parnell TK, Eiselstein LE, Huet R, Wu M. Analysis of drill pipe joint failures and recommendations for service. Prepared for Sedco Forex & Grant Prideco, Inc., FaAA-SF-R-96-07-50, Exponent Failure Analysis Associates, Inc., November 1997.

## **Professional Affiliations**

- American Society of Mechanical Engineers (member)
- American Society for Testing and Materials (member)