

Charles Funk, Ph.D., P.E., CFEI, CVFI
Managing Engineer

Professional Profile

Dr. Charles Funk is a Managing Engineer in Exponent's Vehicle Engineering practice. He specializes in accident reconstruction and simulations, crashworthiness, rollover analysis, fire investigation, photogrammetry, fluid mechanics, combustion, heat transfer, and thermodynamics. Dr. Funk has research experience with narrow object impacts, bumper mismatch collisions, accident simulation validation, and vehicle body crush. Dr. Funk is also a certified Bosch Crash Data Retrieval (CDR) Technician and Analyst. He has a background in the analysis of combustion, flow, and emissions in internal combustion engines via the use of laser diagnostic techniques. He has worked at Synthes Corporation, where he assisted in the design of a radiolucent aiming guide to assist surgeons with repairing broken femoral bones. Dr. Funk has also worked at Demag Delaval Turbomachinery, where he performed thermodynamic and fluid analyses on centrifugal and axial compressors for petrochemical applications.

Prior to joining Exponent, Dr. Funk received his doctorate from the University of Michigan, where he performed both an experimental and computational comparison of turbulent flows in an internal combustion engine. In this work, he performed some of the first high-resolution turbulence measurements in an internal combustion engine to assist in developing and validating advanced turbulence models. Dr. Funk is proficient in German and French and has an intermediate knowledge of Spanish.

Academic Credentials and Professional Honors

Ph.D., Mechanical Engineering, University of Michigan Ann Arbor, 2005
M.S., Mechanical Engineering, University of Michigan Ann Arbor, 2001
B.S., Mechanical Engineering, Drexel University (*magna cum laude*), 1999

Licenses and Certification

Licensed Professional Engineer, Michigan, #6201056673
Certified Fire and Explosions Investigator (C.F.E.I.)
Certified Vehicle Fire Investigator (C.V.F.I.)
Certified Bosch Crash Data Retrieval (CDR) Technician and Analyst

Languages

German, French

Continued Education

Northwestern Accident Reconstruction Course, 2006
SAE Vehicle Accident Reconstruction Methods, 2005
National Fire, Arson & Explosion Investigation Training, 2007
Fire Analysis Litigation Seminar, 2007
Vehicle Fire, Arson, and Explosions Investigation Training, 2007
Bosch CDR Technician and Analyst Course, 2008

Publications

Funk C, Sick V, Reuss DL, Dahm WJA. Turbulence properties of high and low swirl in-cylinder flows. SAE Technical Paper Series, 2002-01-2841, 2002.

Funk C. Detailed analysis of experimental in-cylinder flow fields with applications to a k-epsilon model. Master's Thesis, University of Michigan, December 2001.

Doctoral Dissertation

Funk C. An in-depth comparison of experimental and computational turbulence parameters for in-cylinder engine flows. The University of Michigan, Ann Arbor, MI, April 2005.

Presentations and Published Abstracts

Funk C. Implications of swirl on turbulence properties in an IC Engine. Physical Chemistry Group at the University of Heidelberg, Germany, November 2002.

Funk C. Turbulence properties of high and low-swirl flows. Fall 2002 SAE Fuels and Lubricants Conference, San Diego, CA, October 2002.

Funk C. Implications of swirl on kinetic energy in SI engines. 3rd Annual Graduate Student Symposium, University of Michigan, Ann Arbor, MI, September 2002.

Funk C. Comparison of experimental in-cylinder flow fields to a k-epsilon model. Combustion and Fuels Group of Drexel University, Philadelphia, PA, November 2001.

Funk C. Detailed analysis of experimental in-cylinder flow fields with applications to a k-epsilon model. General Motors Research and Development Center, Warren, MI, October 2001.

Peer Reviewer

- Society of Automotive Engineers

Professional Affiliations

- Society of Automotive Engineers
- International Association of Arson Investigators
- National Association of Fire Investigators