



Colwell Consulting
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Jeff Colwell, Ph.D., P.E.

Dr. Jeff Colwell is a Principal Engineer at Colwell Consulting where he specializes in the engineering analysis of thermal and combustion processes, especially the cause, origin, and propagation of fires and explosions. Dr. Colwell has investigated fires and explosions in a wide array of applications including motor vehicles, residential and commercial structures, wildfires, and industrial complexes associated with the chemical, drilling, refining, and mining industries. Technical issues addressed have included cause and origin determination, burn pattern interpretation, evaluation of ignition mechanisms, smoldering and self-heating, fire spread, smoke transport, smoke detector operation, building evacuation, fire department response, carbon monoxide poisoning, and lithium-ion battery performance. He also evaluates the design and performance of household appliances, heating and cooling equipment, and various other consumer products. Dr. Colwell's research has focused on fire dynamics, burn patterns, and forced ignition mechanisms, including spark (electrostatic) and hot-surface ignition of combustibles, as well as ignition mechanisms associated with various types of electrical components. He has also conducted research involving complex two-phase flows, liquid atomization, and droplet transport.

Prior to founding Colwell Consulting, Dr. Colwell was a Principal Engineer at Exponent where he worked for more than 18 years. Dr. Colwell also held research positions at AlliedSignal Aerospace, the Combustion Laboratory at Arizona State University, the High Temperature Gas Dynamics Laboratory at Stanford University, and the Thermal Sciences and Propulsion Center at Purdue University.

Education

Ph.D., Mechanical Engineering, Arizona State University
M.S., Engineering, Stanford University
M.S., Mechanical Engineering, Purdue University
B.S., Mechanical Engineering, University of Wyoming

Licenses and Certifications

Registered Professional Mechanical Engineer, Arizona, #31176
Registered Professional Mechanical Engineer, California, #M32037
National Counsel of Examiners for Engineering and Surveying (NCEES) Council Record file No. 51102

Fire Cause and Origin Investigation 1A and Techniques of Fire Investigation 1B accredited by the California State Fire Marshal; Vehicle Fire Cause and Origin Investigation Course; Fundamentals of Automotive Fuel Delivery Systems Course, Society of Automotive Engineers, and Advanced Cognitive Interviewing and Forensic Statement Analysis, Behavior Analysis Training Institute.

Professional Honors

Principal Member: Technical Committee on Recreational Vehicles, NFPA 1192: *Standard on Recreational Vehicles*, NFPA 1194: *Standard for Recreational Vehicle Parks and Campgrounds*, National Fire Protection Association, 2006–2019.

Committee Chairman and Session Organizer: Fire Safety Sessions at SAE World Congress, Society of Automotive Engineers, 2008–2010.

Pi Tau Sigma; Mortar Board; Omicron Delta Kappa
SAE Excellence in Oral Presentation Award, 2009 and 2010
SAE Lloyd L. Withrow Distinguished Speaker Award, 2012
Outstanding Research Award, Union Carbide Corporation, 1994

Book Chapters

Long, R.T., Colwell, J.D., Ray, R., Grossman, H.L., Thomas, B. and Strassburger, R. (2008) Passenger vehicle fires. In Cote, A.E. (Ed.), *Fire Protection Handbook*, 20th Edition. National Fire Protection Association, Quincy, MA, Vol. 2, Sect. 21, Chap. 1, pp. 21-3 – 21-14.

Publications

Papageorge, M. and Colwell, J. (2024) Evaluating Fire Propagation into the Passenger Compartment via Full-Scale Burn Testing, SAE Technical Paper 2024-01-2502.

Papageorge, M., Knox, B. and Colwell, J. (2024) Full-Scale Vehicle Burn Test of a 2013 Sedan in a Wildfire Setting, SAE Technical Paper 2024-01-2503.

Colwell, J., Knox, B. (2022) Reliability of Eyewitness Statements in Fire and Explosion Investigations. *International Journal of Psychological and Behavioral Sciences*, 16(9), 483 – 487.

Knox, B.W., Papageorge, M., Colwell, J.D. (2020). Full-Scale Burn Test of a 2014 Sport Utility Vehicle. SAE Technical Paper 2020-01-0925.

Colwell, J.D. and Knox, B.W. (2018) Full-Scale Burn Tests of Side-by-Side All-Terrain Vehicles. SAE Paper 2018-01-0279.

Papageorge, M. and Colwell, J.D. (2018) High-Performance Rear- and Mid-Engine Vehicle Exhaust System Temperatures. SAE Paper 2018-01-1436.



Colwell, J.D. and Henry, C.D. (2016) Full-Scale Burn Test of a 2007 Cargo Van. SAE Paper 2016-01-1403.

Colwell, J. D. (2015) Oxidation Patterns in Motor Vehicle Fire Investigations – Unraveling the Myths. *Fire and Arson Investigator*, January, 2015, 26-36.

Colwell, J.D. (2014) Full-Scale Burn Test of a 1998 Compact Passenger Car. SAE Paper 2014-01-0426.

Colwell, J.D. (2013) Full-Scale Burn Test of a 2001 Full-Size Pickup Truck. *SAE Int. J. Trans. Safety* 1(2). Also in SAE Paper 2013-01-0214.

Colwell, J.D. and Cundy, M. (2013) Full-Scale Burn Test of a 1992 Compact Pickup Truck. *SAE Int. J. Trans. Safety* 1(2). Also in SAE Paper 2013-01-0209.

Colwell, J.D. and Babic, D. (2012) A Review of Oxidation on Steel Surfaces in the Context of Fire Investigations. *SAE Int. J. Passeng. Cars-Mech. Syst.* 5(2). Also in SAE Paper No. 2012-01-0990.

Colwell, J.D. (2010) Ignition of Combustible Materials by Motor Vehicle Exhaust Systems - A Critical Review. *SAE Int. J. Passeng. Cars-Mech. Syst.* 3(1), 263. Also in SAE Paper No. 2010-01-0130.

Colwell, J.D. and Biswas, K. (2009) Steady-State and Transient Motor Vehicle Exhaust System Temperatures. *SAE Int. J. Passeng. Cars-Mech. Syst.* 2(1), 206. Also in SAE Paper No. 2009-01-0013.

Colwell, J.D., Mongia, R. and Reza, A. (2005) Case Study on Evacuation Rates within the World Trade Center Towers on September 11, 2001. 49th Annual Human Factors and Ergonomics Society Conference, Orlando, FL, September 26–30.

Colwell, J.D. and Reza, A. (2005) Hot Surface Ignition of Automotive and Aviation Fluids. *Fire Technology*, 41(2), 105–123.

Colwell, J.D. and Reza, A. (2003) Use of Soot Patterns to Evaluate Smoke Detector Operability. *Fire and Arson Investigator*, July, 2003, 42–45.

Martin, R.J. and Colwell, J.D. (2003) De Novo VOC from Regenerative Thermal Oxidizers. ASME Summer Heat Transfer Conference, Paper No. HT2003-40557, Las Vegas, NV, July 21–23, 2003.

Colwell, J.D., Korb, T.M. and Peck, R.E. (2002) Hot Surface Ignition of Jet-A Fuel by Conductive Deposits. *Proc. Combust. Inst.*, **29**, 297-303.



Colwell, J.D. (2001) Hot Surface Ignition of Jet-A Fuel by Conductive Deposits, Ph.D. Dissertation, Arizona State University.

Colwell, J.D. and Peck, R.E. (2001) Ignition of Jet-A Fuel by Silver Oxide Deposits. 18th International Colloquium on the Dynamics of Explosions and Reactive Systems, Seattle, WA, August 2001.

Colwell, J.D. and Peck, R.E. (2001) Ignition of Jet-A fuel on Silver Oxide Deposits. 2nd Joint Meeting of the U.S. Sections of the Combustion Institute, Oakland, CA, March 2001.

Cooperrider, N.K., Hammoud, S.A. and Colwell, J.D. (1998) Characteristics of Soil-Tripped Rollovers. SAE Paper No. 980022.

Senser, D.W., Colwell, J.D. and Smith, R.M. (1995) An Experimental Study of the Structure of Supercritical Fluid and Conventional Air Paint Sprays. 22nd Waterborne, High-Solids, and Powder Coatings Symposium, pp. 161–170, New Orleans, LA, February, 1995.

Senser, D.W., Colwell, J.D. and Nielsen, K.A. (1994) An Experimental Study of Workpiece Interaction Regions and Impact Velocities of Supercritical Fluid Spray. 4th Annual ESD Advanced Coatings Technology Conference, pp. 369–379, Dearborn, MI, November 1994.

Senser, D.W., Colwell, J.D. and Nielsen, K.A. (1994) A Comparison Between the Structure of Supercritical Fluid and Conventional Air Paint Sprays. 7th Annual Conference on Liquid Atomization and Spray Systems, pp. 35–39, Bellevue, WA, May 1994.

Colwell, J.D., Senser, D.W. and Nielsen, K.A. (1993) Influence of Temperature on the Structure of Supercritical Fluid Coating Sprays. 24th Annual Meeting of the Fine Particle Society, Chicago, IL, August 1993.

Colwell, J.D. (1993) Influence of Pressure and Temperature on the Structure of Supercritical Fluid Coating Sprays, M.S. Thesis, Purdue University.

Colwell, J.D., Senser, D.W. and Nielsen, K.A. (1993) Influence on Temperature on the Structure of Supercritical Fluid Coating Sprays. 6th Annual Conference on Liquid Atomization and Spray Systems, pp. 39–43, Worcester, MA, May 1993.

Instructor

“Fundamentals of Motor Vehicle Fire Investigation” Society of Automotive Engineers, 2009–present.

“Vehicle Fire Investigation” California Conference of Arson Investigators, San Luis Obispo, California, November 10, 2010.



Editorships

Associate Editor, SAE International Journal of Passenger Cars – Mechanical Systems, 2010-2021.

Peer Reviewer

- *Fire Technology*
- *Journal of Fire Sciences*
- SAE World Congress - Fire Safety Session

