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Engineering & Scientific Consulting

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Professional Profile

Dr. Biteau specializes in fire protection engineering and the characterization of materials under fire conditions. He applies fire dynamics, heat transfer, and fluid dynamics principles to investigate the origin and causes of fires, for the prevention of fires and explosions and for product development. Dr. Biteau has experience in thermal and combustion analyses; risk and egress analyses; and fire, explosion, and computational fluid dynamic (CFD) modeling. He is familiar with small and large-scale fire experiments based on internationally accepted standards (NFPA, ASTM, UL, ISO, NASA). Dr. Biteau's experience in the gas pipeline industry includes a year-long effort to assist a large gas utility company with the implementation of a plan to validate the Maximum Allowable Operating Pressure (MAOP) for its gas transmission lines and gas transmission stations.

Dr. Biteau uses his background to investigate fires involving commercial cooking fire protection equipment, commercial cooking operation ventilation systems, consumer products including consumer electronics, space heaters, electric water bath canners, LED light tubes, and fixtures. His experience also includes the assessment of the fire performance of materials for various applications, the evaluation and inspection of buildings, facilities, and products for code compliance in accordance with National Fire Protection Association (NFPA) codes, International Code Council (ICC) codes, and state/ local codes.

Dr. Biteau has both small- and large-scale fire testing experience with nationally and internationally recognized standards. He has conducted testing on a wide range of materials such as fabrics, polymers, insulation and building materials, paints, coatings, combustible and flammable liquids as well as lithium ion batteries. He designs, manages and executes testing, and is proficient at installing various types of instrumentation to measure temperature, heat flux, pressure, gas or liquid flow rate, flame spread and gas concentrations for fire tests.

Previous research he focused in involved the thermal and chemical characterization of energetic materials (pyrotechnics, propellants, explosives) susceptible to burn under low oxygen or inert atmospheres. He developed a methodology to estimate the Heat Release Rate from the combustion of energetic materials by coupling thermal analyses (DSC, TGA) and principles of oxygen (OC) and carbon oxides (CDG) calorimetry. He also defined the uncertainty associated with this methodology and identified the minimum material information that is required to obtain acceptable precision on the heat release estimation.

Before joining Exponent, Dr. Biteau carried out several CFD analyses of ventilation systems. The analyses included the study of clean rooms during a fire to assess the spread of toxic gases and the temperature rise inside the facility. His experience also includes the study of the smoke moving performance of the ventilation system in tunnel. He has performed calorimetric studies on porous fuels beds to describe transport mechanisms associated with wildland fires. He was part of the egress analysis of a high-rise building in Sao Paulo (Brazil) and participated in the design, preparation, and supervision of

the large-scale fire tests conducted in Dalmarnock (UK). He provided consulting services for the fire and flammability characterization of materials such as pyrotechnics and polymers.

Academic Credentials & Professional Honors

Ph.D., Fire Safety Engineering, University of Edinburgh, UK, 2010

M.S., Civil Engineering, Ecole Supérieure des Mines de Saint Etienne, France, 2005

M.S., Theoretical Physics, University of Poitiers, France, 2003

B.S., Theoretical Physics, University of Poitiers, France, 2002

Licenses and Certifications

Licensed Professional Fire Protection Engineer, California, #1941

Certified Fire and Explosion Investigator (CFEI) in accordance with the National Association of Fire Investigators (NAFI) National Certification Board per NFPA 921 (2011); NAFI Advanced Fire, Arson, and Explosion Investigation Training Program (21 hours tested), Recertified 2016

Professional Affiliations

Society of Fire Protection Engineers — SFPE (Member)

International Association of Fire Safety Science — IAFSS (Member)

National Fire Protection Association — NFPA (Member)

National Association of Fire Investigators - NAFI (Member)

Languages

French

Publications

Somandepalli V, Biteau H. Cone calorimetry as a tool for thermal hazard assessment of Li-ion cells. SAE International Journal of Alternative Powertrains 2014; 3(2):222-233.

Utiskul Y, Wu N, Biteau H. Combustion air requirements for power burner appliances. The Fire Protection Research Foundation, January 2012.

Bartoli P, Simeoni A, Biteau H, Santoni PA, Torero JL. Determination of the main parameters influencing forest fuel combustion dynamics. Fire Safety Journal 2010; 46(102):27-33.

Biteau H, Fuentes A, Marlair G, Torero JL. The Influence of oxygen on the combustion of a fuel/oxidizer mixture. Experimental Thermal and Fluid Science 2010; 34(3):282-289.

Biteau H, Fuentes A, Marlair G, Torero JL. Ability of the fire propagation apparatus to characterise the heat release rate of energetic materials. Journal of Hazard Materials 2009; 166(2-3):916-924.

Abecassis-Empis C, Reszka P, Steinhaus T, Cowlard A, Biteau H, Welch W, Rein G, Torero JL. Characterisation of Dalmarnock fire test one. Experimental Thermal and Fluid Science 2008; 32(7):1334-

1343.

Schemel CF, Simeoni A, Biteau H, Rivera JD, Torero JL. A calorimetric study of wildland fuels. *Experimental Thermal and Fluid Science* 2008; 32(7):1381-1389.

Conference Publications

Biteau, H., Nava, N., CFD Modeling of Flammable Gas Concentration Levels and Empirical Validation, Proceedings of the 2019 International Symposium on Fire Investigation Science and Technology, Itasca, Illinois, September 24-26, 2018.

Biteau, H., Nava, N., Transportation of Li-ion batteries: The State of Charge Parameter, 2017 Detection, and Signaling Research and Applications Conference, College Park, MD, September 12-14, 2017.

Colella F, Ponchaut N, Biteau H, Marr K, Somandepalli V, Horn QC, Long RT. Electric vehicle fires. 7th International Symposium on Tunnel Safety and Security, Montreal, Canada, March 16-18, 2016.

Colella F, Ponchaut N, Biteau H, Marr K, Somandepalli V, Horn QC, Long RT. Characterization of electrical vehicle fires. 16th International Symposium on Aerodynamics, Ventilation and Fire in Tunnels, Seattle, WA, September 15-17, 2015.

Girods P, Bal H, Biteau H, Rein G, Torero JL. Comparison of pyrolysis behavior results between the cone calorimeter and the fire propagation apparatus heat sources. Proceedings, 10th Symposium of the International Association of Fire Safety Science, University of Maryland, College Park, USA, pp. pp. 889-901, June 19-24, 2011.

Biteau H, Fuentes A, Marlair G, Bertrand JP, Torero JL. A methodology to characterise thermal and chemical effects of energetic materials by use of the FM-global fire propagation apparatus. Proceedings, 11th International Conference, Interflam07, Vol. 1, pp. 427-439, London, England, September 3-5, 2007.

Biteau H, Fuentes A, Marlair G, Torero JL. Heat release rate of energetic materials by calorimetric methodology. 5th Mediterranean Combustion Symposium, Monastir, Tunisia, 2007.

Biteau H, Fuentes A, Marlair G, Brohez S, Torero JL. Ability of the fire propagation apparatus to characterise thermal effects of energetic materials. Proceedings, EUROPYRO 2007, pp. 367-382, Beaune, France, October 8-11, 2007.

Abecassis Empis C, Snorrason D, Lee J, Reszka P, Steinhaus T, Cowlard A, Biteau H, Stratford T, Gillie M, Rein G, Welch S, Torero JL. The Dalmarnock fire tests. IFE AGM, Cambridge, July 2007. [IFE Bodycote Warrington Fire Research Prize for the Best Fire Safety Engineering Paper 2007].

Marlair G, Biteau H, Branka R, Torero JL. Extending the use of the fire propagation apparatus to qualify burning scenarios of energetic materials and oxidative properties of chemicals. Proceedings, 35th International Pyrotechnics Seminar, pp. 677-686, Fort Collins, CO, July 13-18, 2008.

Biteau H, Steinhaus T, Schemel C, Simeoni A, Marlair G, Bal N, Torero JL. Calculation methods for the heat release rate of materials of unknown composition. Proceedings, 9th International Symposium, Fire Safety Science, Karlsruhe, Germany, 2008.

Branka R, Marlair G, Biteau H. Characterisation of sparklers and Bengal flames using the fire propagation apparatus. Proceedings, 11th International Symposium on Fireworks, Puerto Vallarta, Mexico, April 20-24, 2009.

Other Publications

Biteau H, Marlair G, Drysdale D, Torero JL. Characterisation of the thermal and chemical effect of energetic materials not likely to detonate. 31st International Symposium on Combustion, Work in Progress Poster, Heidelberg, Germany, August 2006.

Biteau H, Marlair G, Torero JL, Measuring the rate of heat release from burning energetic materials by fire calorimetry, IGUS-EPP Meeting, Verneuil-en-Halatte, France, April 23-25, 2007.

Reszka P, Steinhaus T, Biteau H, Carvel RO, Rein G, Torero JL. A study of fire durability for a road tunnel: Comparing CFD and simple analytical models. Proceedings, ECCOMAS Thematic Conference on Computational Methods in Tunnelling (EURO:TUN 2007), Vienna, Austria, August 27-29, 2007.

Books Chapters

Ibarreta A, Biteau H, Sutula J. BLEVEs and fireballs. Chapter of the 5th Edition of the SFPE Handbook, SFPE, 2015, in press.

Reszka P, Abecassis-Empis C, Biteau H, Cowlard A, Steinhaus T, Fletcher I, Fuentes A, Gillie M, Welch S. Experimental layout and description of the tests. The Dalmarnock Fire Tests: Experiments and Modelling. Rein, Abecassis-Empis, Carvel (eds), 2007.

Peer Reviewer

Journal of Energy Storage

Applied Thermal Engineering

Fire Safety Journal

Proceedings of the Combustion Institute