Exponent®
Engineering & Scientific Consulting

Jacques De Beer, Ph.D., CFEI

Associate | Thermal Sciences
Bowie
+1-301-291-2544 | jdebeer@exponent.com

Professional Profile

Dr. De Beer leverages his knowledge of fire protection engineering, material flammability, and fire dynamics to analyze fire protection and life safety systems and enclosure fire behavior as well as to evaluate the flammability behavior of gas-, liquid-, and solid-phase materials. Dr. De Beer has been involved with the analysis of incidents involving flammable and combustible liquids, liquified gas systems, photovoltaic solar systems, spray foam insulation, electrostatic discharge events, hot work activities in hazardous environments, smoke detectors, fire suppression systems, consumer products, and oxygen-enriched systems. Dr. De Beer has also been involved with the evaluation of burn injuries attributed to fires and explosion events related to the handling and use of ignitable liquids.

Dr. De Beer has industry experience as a Certified Fire and Explosion Investigator, conducting origin-and-cause investigations for residential, commercial, and industrial fire and explosion events. Dr. De Beer has experience evaluating the installation, maintenance, fire hazard, and life safety compliance of fire suppression and detection systems, liquefied gas systems, photovoltaic systems, oxygen-enriched atmospheres in health care facilities, and flammable and combustible liquid systems according to national and international codes and standards (i.e. NFPA, ICC, EN, ISO, and UL). Dr. De Beer also has extensive practical experience designing and performing fire experiments used to evaluate the ignition and flame spread behavior of a myriad of materials and products.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, University of Maryland, College Park, 2023

M.S., Fire Protection Engineering, University of Maryland, College Park, 2020

B.Eng., Chemical Engineering, University of Pretoria, South Africa, 2017

Principal Member: NFPA 1961, Standard on Fire Hose, FHS-AAA Technical Committee, National Fire Protection Association, 2024 - present

Alternate Member: NFPA 30, Flammable and Combustible Liquids Code, FLC-FUN Technical Committee on Fundamentals of Flammable and Combustible Liquids, National Fire Protection Association, 2024 – present

Alternate Member: NFPA 54, National Fuel Gas Code, NFG-AAA Technical Committee, National Fire Protection Association, 2024 - present

Licenses and Certifications

40-Hour Hazardous Waste Operation and Emergency Response Certification (HAZWOPER) (FL)

Certified Fire and Explosion Investigator (CFEI)

Professional Affiliations

Society of Fire Protection Engineers (SFPE)

National Fire Protection Association (NFPA)

International Assosiation of Arson Investigators (IAAI)

National Association of Fire Investigators (NAFI)

National Fire Sprinkler Association (NFSA)

Publications

De Beer, JA, Long RT (2024), Making Work Around Flammable & Combustible Liquids Safer, Industry Analysis, Exponent, Inc.

Lauterbach, A, Lee, S, De Beer, JA, Stoliarov, SI, Sunderland, PB, Gollner, MJ, Filkov, AI, Horn, GP. Ignition and Combustion Behavior of Wood-plastic Composite Exposed to Glowing Firebrand Piles: Impact of Air Flow Velocity, Firebrand Coverage Density, and Pile Orientation, Fire Safety Journal, Volume 147, 2024, 104198, https://doi.org/10.1016/j.firesaf.2024.104198.

De Beer, JA, Dietz, EL, Stoliarov, SI, Gollner, MJ, An Empirical Firebrand Pile Heat Flux Model, Fire Safety Journal, 141, 2023, 104004, doi.org/10.1016/j.firesaf.2023.104004.

Filkov, AI, Tihay-Felicelli, V, Masoudvazir, N, Rush, D, Valencia, A, Wang, Y, Blunck, DL, Valero, MM, Kempna, K, Smolka, J, De Beer, JA, Campbell-Lochrie, Z, Centeno, FR, Asim Ibrahim, M, Lemmertz, CK, Tam, WC, A review of thermal exposure and fire spread mechanisms in large outdoor fires and the built environment, Fire Safety Journal, 140, 2023, 103871, doi.org/10.1016/j.firesaf.2023.103871.

De Beer JA, Alascio JA, Stoliarov, SI, Gollner, MJ. Analysis of the Thermal Exposure and Ignition Propensity of a Lignocellulosic Building Material Subjected to a Controlled Deposition of Glowing Firebrands. Fire Safety Journal. 2022. 135, pp. 103720–103720, doi:10.1016/j.firesaf.2022.103720.

Wang, Y, Wadhwani, R, Suzuki, S, Theodori, M, Asimakopoulou, E, De Beer JA, Flores, N, Asim Ibrahim, M, Johanna, H, Kempna, K, Manzello, SL, Sharma, A, Smolka, J, Wickramasinghe, A, Wu, AC, Xia, T, Case studies of large outdoor fires involving evacuations Part 2, Emergency Management & Evacuation (EME) Subgroup, Large Outdoor Fires & the Built Environment (LOF&BE) Working Group of the International Association for Fire Safety Science, 2022 July. doi:10.5281/zenodo.6544760.

De Beer JA, Raffan-Montoya F, Stoliarov SI. A Milligram-scale Flame Calorimeter Pyrolyzer System used to Emulate Burning of Nonthermally Thin Solid Samples. Fire and Materials. 2021; 46(1) 302 – 312, doi:10.1002/fam.2996.

De Beer JA, Focke WW. Oxidative degradation of polyolefins in the presence of cupric and ferric stearate additives. Macromolecular Symposia. 2019, 384(1), doi:10.1002/masy.201800149.

Presentations

De Beer, JA, Dietz, E, Stoliarov, SI, Gollner, MJ. Development of a Novel Transient Firebrand Pile Heat

Flux Model, FM Global CFD Modeling Workshop, 2023.

De Beer, JA, Raffan-Montoya, F, Stoliarov, SI. Novel Design of a Milligram-scale Pyrolyzer system used to Emulate the Burning Behavior Exhibited by Cone Calorimetry-Sized Samples, ACS Fire and Polymers, 2022.

De Beer, JA, Alascio, JA, Stoliarov, SI, Gollner, MJ. Thermal Quantification and Ignition Study of Firebrand Pile-Exposed Wildland-Urban Interface Decking Materials, Eastern States Section of the Combustion Institute, 2022.

De Beer, JA, Alascio, JA, Stoliarov, SI, Gollner, MJ. Thermal Characterization and Ignition Study of Decking Materials Exposed to Firebrand Attack, IAFSS LOF&BE Student Seminar Series (Virtual), 2022.

De Beer, JA, Raffan-Montoya, F, Stoliarov, SI. Design of a Milligram-scale Pyrolyzer System used to Emulate the Burning Behavior Exhibited by Cone Calorimetry Samples, ASTM International Symposium on Obtaining Data for Fire Growth Models, 2021.

De Beer, JA, Alascio, JA, Stoliarov, SI, Gollner, MJ. Thermal Characterization and Ignition Study of Western Red Cedar Exposed to Firebrand Attack. Oral Presentation, 12th Asia-Oceania Symposium on Fire Science and Technology (Virtual), University of Queensland, Australia, 2021.

De Beer, JA, Raffan-Montoya, F, Stoliarov, SI. Novel Design of a Pyrolyzer System used to Emulate the Burning Behavior Exhibited by Cone Calorimetry-Sized Samples. Annual SFPE Chesapeake Chapter Meeting (Virtual), Maryland, 2021.

De Beer, JA, Raffan-Montoya, F, Stoliarov, SI. Novel Design of a Milligram-scale Flame Calorimetry Pyrolyzer System used to Emulate the Burning Behavior Exhibited by Cone Calorimetry-Sized Samples, 12th U.S. National Combustion Meeting (Virtual), Texas A&M University, Texas, 2021.

De Beer, JA, Raffan-Montoya, F, Stoliarov, SI. Milligram-scale Flame Calorimeter Pyrolyzer System: Emulation of Burning Behavior of Non-thermally Thin Solid Samples. Poster Presentation, 13th International Symposium of Fire Safety Science (Virtual), University of Waterloo, Canada, 2021.

De Beer, JA. Proof of Concept: Thermal Imaging as an Alternative Method for Depth of Calcination Analysis. Poster Presentation, International Association of Arson Investigators International Training Conference, Texas, 2018.

Additional Education & Training

Photovoltaic Systems Investigation Training, International Association of Arson Investigators (IAAI), 2024

Appliance Fires Training, Maryland Fire and Explosion Investigators Association, 2024

Fire Investigation Training Program, National Association of Fire Investigators (NAFI), 2024

FED Kitchen Suppression System Inspection, Testing, and Maintenance Hands-On Training, 2023

International Association of Arson Investigators (IAAI) CFITrainer.net:

Photovoltaic Cells and Systems, 2024

Residential Electrical Systems, 2024

Site Safety Assessment, 2024

Electrical Safety, 2024

Basic Electricity. 2024

Critical Evaluation and Testing of Commonly Reported Accidental Causes, 2023

Li-Ion battery Fires, 2023

Wildland Fires Investigation, 2021

Documenting the Event, 2017

Fire Investigator Scene Safety, 2017

Fire Chemistry, 2017

Thermometry, Heat, and Heat Transfer, 2017

Digital Photography and the Fire Investigator, 2016

Ethics and the Fire Investigator, 2016

The Impact of Ventilation in Building Structures on Fire Development, 2016

Understanding Fire Through the Candle Experiments, 2016

Writing the Initial Origin and Cause Report, 2016

The Practical Application of the Relationship Between NFPA 1033 and NFPA 921, 2016

Explosion Dynamics, 2015

NFPA1033 and Your Career, 2015

Arc Mapping Basics, 2014

The Scientific Method for Fire and Explosion Investigation, 2013

Peer Reviews

Technical Reviewer, Fire & Arson Investigator Journal Scientific Review Committee, International Association of Arson Investigators