

Exponent®
Engineering & Scientific Consulting

Jacques De Beer, Ph.D., CFEI

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Professional Profile

Dr. De Beer has multidisciplinary expertise in fire protection, mechanical, and chemical engineering. He applies his expertise to the investigation and prevention of a broad spectrum of thermal and injurious events. Dr. De Beer investigates and analyzes residential, commercial, and industrial fires and explosions and their origin and cause.

Dr. De Beer's fire safety project experience includes fire protection and life safety systems, flammable and combustible liquids, electrostatic discharge incidents, hazardous chemicals, smoke alarms, hot work incidents, batteries and battery energy storage systems (BESS), electric vehicles, wildfires, oxygen-enriched systems, gas distribution systems and fuel-fired equipment, photovoltaic systems, and emergency response planning. Dr. De Beer has experience evaluating the compliance of a myriad of products, materials, processes and systems according to national and international codes and standards – NFPA, ICC, EN, ISO, API, AWS, OSHA, and UL. Dr. De Beer also has fire modeling expertise using modeling tools such as Fire Dynamics Simulator (FDS) and Consolidated Fire and Smoke Transport (CFAST).

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 77, Recommended Practice on Static Electricity, STA-AAA Technical Committee, National Fire Protection Association, 2025 – present

Principal Member: NFPA 1960, Standard for Fire Hose Connections, Spray Nozzles, Manufacturer's Design of Fire Department Ground Ladders, Fire Hose, and Powered Rescue Tools, 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

Task Group Member: API 2001, Fire Protection in Refineries, 2025 - Present

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Task Group Member: API 2003, Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents, 2025 – Present

Task Group Member: API 2009, Safe Welding, Cutting, and Hot Work Practices in the Petroleum and Petrochemical Industries, 2025 - Present

Task Group Member: API 2030, Application of Fixed Water Spray Systems for Fire Protection in the Petroleum and Petrochemical Industries, 2025 - Present

Licenses and Certifications

Certified Fire and Explosion Investigator (CFEI)

National Fire Protection Association (NFPA) Hot Work Safety Certificate Program

Professional Affiliations

Society of Fire Protection Engineers (SFPE)

National Fire Protection Association (NFPA)

International Association of Arson Investigators (IAAI)

National Association of Fire Investigators (NAFI)

National Fire Sprinkler Association (NFSA)

Publications

Lee, S, **De Beer, JA**, Stoliarov, SI, Sunderland, PB. "A criterion for ignition of combustible solids exposed to firebrand piles." Fire Safety Journal, Volume 162, 2026.

Mohamed, ME, Penman, TD, **De Beer, JA**, Stoliarov, SI, Horn, GP, Filkov, AI. "Evaluating the thermal response of large-scale decking assemblies exposed to firebrand piles." Applications in Energy and Combustion Science, Volume 25, 2026.

Lee, S, **De Beer, JA**, Stoliarov, S, Sunderland, PB, Gollner MJ, Pyrolysis models for pressure-treated wood and wood-plastic composite, Fire and Materials, 2024, 49:86-101, doi/10.1002/fam.3249

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

Spray, R, Lindahl, P, Steigerwalt, K, De Beer, JA, Data Centers, BESS & Speed to Power, Exponent Webinar, 2026.

De Beer, JA, Robinson, K, Static Electricity Practices Applied to the Petrochemical Industry, Electrostatic Society of America Annual Conference, 2026.

White, K, Orella, M, De Beer, JA, Colella, F, Shipboard Fire Suppression – Is Your Current System Ready for Li-Ion?, WATTS UP, Maritime Battery Forum, 2026.

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

Sprinkler Training, American Fire Sprinkler Association, Chesapeake Chapter, 2026.

NFPA 70E Arc Flash Safety, The Electricity Forum, 2025.

Introduction to Fire Dynamics Simulator (FDS) and Smokeview, Society of Fire Protection Engineers, 2025

Sprinkler Protection for Parking Structures, Society of Fire Protection Engineers, Chesapeake Chapter, 2025

Commodity Classification: A Critical Consideration in Automatic Fire Sprinkler System Design, Society of Fire Protection Engineers, 2025

Bulk Storage of Battery Products, SFPE Engineering Symposium, 2025

Investigation Fires in Sprinklered Buildings, Society of Fire Protection Engineers, 2025

Addressing Warehouse Sprinkler Design and Fire Service Disconnect, Society of Fire Protection Engineers, 2025

Next-Generation Radiant Energy Detectors – Integration with IoT and AI, Society of Fire Protection Engineers, 2025

Flame Detectors 101 – Understanding NFPA 72, Society of Fire Protection Engineers, 2025

Bulk Storage of Battery Products, Society of Fire Protection Engineers, 2025

Antifreeze for Fire Sprinkler Systems, BlazeMaster, 2025

Design Fire Scenarios for Hazard Assessment of Modern Passenger Vehicles, Society of Fire Protection Engineers, 2025

Protecting Flammable and Combustible Liquids, Society of Fire Protection Engineers, 2025

BlazeMaster Fire Protection Systems Installer Training, BlazeMaster, 2025

Fire Dynamics in the Wildland, CFITrainer.net, 2025

How Should Lithium-ion Batteries that are Not an Energy Storage System be Stored and Handled?, Society of Fire Protection Engineers, 2025

AquaMist ULF – Low Pressure Water Mist Systems for Building Protection in Accordance with EN 14972, Society of Fire Protection Engineers, 2025

Sprinkler Hydraulic Calculations, American Fire Sprinkler Association (AFSA), 2024

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

Photovoltaic Cells and Systems, CFITrainer.net, 2024

Residential Electrical Systems, CFITrainer.net, 2024

Site Safety Assessment, CFITrainer.net, 2024

Electrical Safety, CFITrainer.net, 2024

Basic Electricity, CFITrainer.net. 2024

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

Construction Fire Best Practices, Society of Fire Protection Engineers, 2023

A Baker's Dozen – 13 Things You Might Not Know about CPVC Fire Sprinkler Systems, Society of Fire Protection Engineers, 2023

Critical Evaluation and Testing of Commonly Reported Accidental Causes, CFITrainer.net, 2023

Li-Ion battery Fires, CFITrainer.net, 2023

Wildland Fires Investigation, CFITrainer.net, 2021

Documenting the Event, CFITrainer.net, 2017

Fire Investigator Scene Safety, CFITrainer.net, 2017

Fire Chemistry, CFITrainer.net, 2017

Thermometry, Heat, and Heat Transfer, CFITrainer.net, 2017

Digital Photography and the Fire Investigator, CFITrainer.net, 2016

Ethics and the Fire Investigator, CFITrainer.net, 2016

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

Understanding Fire Through the Candle Experiments, CFITrainer.net, 2016

Writing the Initial Origin and Cause Report, CFITrainer.net, 2016

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

Explosion Dynamics, CFITrainer.net, 2015

NFPA1033 and Your Career, CFITrainer.net, 2015

Arc Mapping Basics, CFITrainer.net, 2014

The Scientific Method for Fire and Explosion Investigation, CFITrainer.net 2013

Peer Reviews

Technical Reviewer, Applications in Energy and Combustion Science, 2026

Technical Reviewer, Fire Technology Journal, 2025

Technical Reviewer, Fire & Arson Investigator Journal Scientific Review Committee, International Association of Arson Investigators (2023 – Present)