

Scott Duquette, PE | Forensic Engineer – Mechanical

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Professional Summary:

Mr. Scott Duquette is a licensed professional engineer in multiple states with 25+ years of experience in the machine tool, aerospace, construction / plumbing products, and medical device industries. He began his career designing mechanical systems for the machine tool industry, then spent several years designing custom equipment, fixtures, and tooling to optimize manufacturing and quality processes for fluid transport systems in the aerospace industry. Later, he focused his efforts on product design and development in the flexible piping and tubing industries. In this context, he studied lightning interaction with ground based systems and developed a marketable lightning effects mitigating product for the CSST industry. More recently, he has designed and developed medical device implants and surgical instrumentation.

Working across several diverse industries has allowed Mr. Duquette to gain experience in various design, manufacturing, and regulatory environments. His product development work consistently used 3D CAD programs with various projects requiring Mr. Duquette to evaluate components and systems utilizing finite element analysis for non-linear large deformation and contact analyses.

Mr. Duquette is proficient in the analysis of mechanical systems and mechanical failures including water losses, ventilation systems, and gas-related events including fires and explosions. He has performed failure analysis on numerous systems including functionality, pressure, and leak testing on gas and water-based plumbing systems and appliances.

Mr. Duquette also has expertise as a Certified Building Analyst and Envelope Professional and Infiltration and Duct Leakage to inspect moisture and pressure issues in residential structures.

Mr. Duquette's expertise includes:

- Mechanical design and analysis
- Mechanical failures and forensics
- Lightning interaction with ground-based systems
- Fitting sealing technologies
- Plumbing and appliance failure investigations for water losses
- Fuel gas systems – natural gas and LP gas (propane)
- Gas fed fires and explosions
- Gas and solid fuel appliance – fires and soot
- Heating, Ventilation, Air Conditioning (HVAC) Systems – moisture and humidity
- Building envelope and infiltration
- Personal Injury – consumer product accidents; industrial equipment accidents
- Patent evaluation and analysis
- Computer Aided Design (CAD) solids modeling

Licenses and Certifications:

Professional Engineer (Additional states available upon application):

Connecticut, 26075

Georgia, 42232

South Carolina, 34630

Tennessee, 120483

North Carolina, 45355

Florida, 83540

Virginia, 402058178

NCEES National Council Record, 18-091-53

Certified Building Analyst Professional (BA-P), Building Performance Institute (BPI)

Certified Building Envelope Professional (EP), Building Performance Institute (BPI)

Certified Infiltration and Duct Leakage (IDL), Building Performance Institute (BPI)

Project Experience:

The sample projects here outline a small sampling of the types of projects and losses Mr. Duquette regularly investigates. For further information or additional examples, please contact EFI Global.

The Guild Apartment Complex, Charleston, South Carolina Fire Sprinkler System Failure Analysis

Investigation and analysis of CPVC piping failure resulting in an approximately \$1 million water loss in a new apartment building caused by improper assembly of a fitting joint.

Commercial Gas Explosion, Durham, North Carolina Mechanical Analysis & Gas Explosion Investigation

Investigated the cause of a natural gas explosion in a commercial building that damaged 15+ buildings resulting from a breached underground gas line damaged from horizontal boring.

Residential Gas Explosion, Charlotte, North Carolina Mechanical Analysis & Gas Explosion Investigation

Investigated the cause of a natural gas explosion in a residential home that damaged 6 other homes resulting from a failed copper tube gas line.

Personal Injury, Charlotte, North Carolina Product Defect & Mechanical Analysis

Investigated an alleged product defect following an injury involving outdoor power equipment (OPE). Performed an analysis of the evidence, the manufacturer's instructions, and witness statements to provide the client with an expert failure analysis opinion.

Project Experience (Continued):

Marriott Courtyard Hotel, Rome, Georgia

Water Loss Investigation & Mechanical Analysis

Investigation and analysis of two separate claims involving a PEX piping failure and bathtub drain failure caused by improper assembly of a fitting joint and bathtub overflow drain. Performed an analysis of the evidence, manufacturers' instructions, industry standards, witness statements, and staff interviews to provide the client with an expert failure analysis opinion.

Titeflex Corporation, Gastite Division, Springfield, Massachusetts

Mechanical Product Design and Development

Developed FlashShield corrugated stainless steel tubing (CSST) system that provides the highest lightning dissipative characteristics and is the only metallic-shielded gas piping system on the market.

Professional Experience:

EFI Global, Inc., Senior Forensic Engineer, Mechanical, 2017 – Present

Unified Investigations and Sciences, Inc., Forensic Engineer, Mechanical, 2017 – Present

Konceptive Engineering Solutions, LLC, Principal, 2015 – 2017

Kinemax Engineering, PLLC, Senior Program Manager, 2010 – 2015

Titeflex Corporation, Gastite Division, Manager and Chief Engineer – R&D, 2004-2010

Titeflex Corporation, Aerospace Division, Equipment Design Engineer, 2000-2004.

Trumpf, Inc., Mechanical Design Engineer, 1999-2000

Formal Education:

Master of Business Administration, University of Connecticut School of Business, Storrs, Connecticut, 2010

Master of Engineering, Mechanical Engineering, University of Hartford, West Hartford, Connecticut, 2006

Bachelor of Science, Mechanical Engineering, Florida Institute of Technology, Melbourne, Florida, 1999

Specialized Education/Training:

Post Loss Equipment Evaluations, EFI Global, 2024

Building Envelope Professional, Building Performance Institute, Inc. (BPI), 2023

Building Analyst Professional, Building Performance Institute, Inc. (BPI), 2023

Infiltration and Duct Leakage, Building Performance Institute, Inc. (BPI), 2023

Building Science Principles, Building Performance Institute, Inc. (BPI), 2022

Fundamentals of Gas Combustion, PDHonline.org, 2022

Hot Water Plumbing Systems, PDHonline.org, 2021

HVAC Systems and Indoor Air Quality, PDHonline.org, 2021

Psychrometric Chart Application to HVAC Troubleshooting, PDHonline.org, 2020

Specialized Education/Training (Continued):

HVAC Overview of Psychrometrics, PDHonline.org, 2020
HVAC Calculations and Duct Sizing, PDHonline.org, 2020
HVAC Entry Level Technician, ACCA, 2020
Mobile Elevation Work Platform (MEWP) Operator Training, 2020
Investigation Solid Fuel-Burning Appliance Fires, Fire Findings, 2019
Investigation of Gas and Electric Appliance Fires, Fire Findings, 2018
Forensic Analysis Involving Fugitive Natural Gas and Propane, SunCam, 2018
Ethics for Engineers - Based on the NSPE Code of Ethics for Engineers, SunCam, 2018
Florida Engineering Laws & Rules, SunCam, 2018
Fundamentals of Interviewing, CFITrainer.net / IAAI, 2018
Explosion Dynamics, CFITrainer.net / IAAI, 2018
NC/SC International Association of Arson Investigators Fire Investigative Approaches Seminar;
Advanced Fatal Fire Investigations, Arson Profiling, Examination of the impact of ventilation
on room fires in full scale structures, SC/NC-IAAI, 2017
AHERA-OSHA Operations & Maintenance Training Course, AAA Environmental, 2017
Fire Investigator Scene Safety, CFITrainer.net / IAAI, 2017
Arc Mapping Basics, CFITrainer.net / IAAI, 2017
Residential Natural Gas Systems, CFITrainer.net / IAAI, 2017
Investigating Natural Gas Systems, CFITrainer.net / IAAI, 2017

Affiliations:

Pi Tau Sigma (International Mechanical Engineering Honor Society)
Beta Gamma Sigma (International Business Honor Society)
Tau Beta Pi (National Engineering Honor Society)
American Society of Mechanical Engineers (ASME)
Society of Plastics Engineers (SPE)

Courses Instructed/ Guest Lecturer:

CSST – Products, Codes, Lightning Interaction, and Related Fires
CSST Lightning Caused Fires for the Claims Adjuster
Water Loss Forensics and Fraud

Publications and Presentations:

Duquette, Scott and Wei, Fu-Shang. "Development of Piezoelectric Servo Flap Actuator" American Institute of Aeronautics and Astronautics. 2007.
Duquette, Scott. "Development of Piezoelectric Servo Flap Actuator" 45th AIAA Aerospace Sciences Meeting and Exhibit. 2007.
Duquette, Scott. "Development of Piezoelectric Servo Flap Actuator" 6th Annual Southern New England Science & Technology Exchange Conference. 2006

United States Patents:

US Patent 9,445,486	Energy dissipative tubes
US Patent 9,249,904	Energy dissipative tubes and methods of fabricating and installing the same
US Patent 9,169,929	Conformal wear-resistant seal
US Patent 9,107,754	Prosthetic joint assembly and prosthetic joint member
US Patent 8,794,840	Conformal wear-resistant bearing assembly
US Patent 8,685,070	Faceted bone screw
US Patent 8,616,772	Conformal wear-resistant bearing assembly
US Patent 8,399,767	Sealing devices and methods of installing energy dissipative tubing
US Patent 8,308,201	Crimp fitting for corrugated stainless steel tubing
US Patent 8,308,812	Prosthetic joint assembly and joint member therefor
US Patent 7,690,695	Sealing fitting and seal seat for stainless steel tubing
US Patent 7,621,567	Corrugated tube fitting with a ridge sealing device and method
US Patent 7,607,700	Sealing device with ridges for corrugated stainless steel tubing