

**Professional Resume
of
TODD S. METZGER, P. E.**

January, 2024

I. General Information

Mechanical Engineer
Schaefer Engineering, Inc.
Wentzville, Missouri

II. Professional Summary

A. Education:

Bachelor of Science, Cum Laude – 2001
Mechanical Engineering
University of Missouri – Rolla
Rolla, Missouri

B. Experience:

May 2008 to present
Position: Mechanical Engineer
Schaefer Engineering, Inc.
Wentzville, Missouri

Responsible for mechanical engineering projects with emphasis in mechanical design analysis, product failure analysis, gas-fired appliance fire evaluation, solid fuel-fired appliance fire evaluation, agricultural equipment fire evaluation, and vehicle fire evaluation. Mechanical engineering expertise includes process industrial equipment, manufacturing equipment and product design. Fire evaluation and investigation background originates from hands-on training and experience as a firefighter and law enforcement officer.

June 2005 to May 2008
Position: Mechanical/Project Engineer
BIS Frucon Engineering, Inc.
Ballwin, Missouri

Specialized in engineering and construction of industrial projects such as metals refining, chemical processing, cement production and consumer products. Responsibilities included operation and

Experience (continued):

design of heavy industrial equipment, design of process piping systems, process development and on-site construction engineering. Additionally, duties included project coordination and management.

December 2001 to May 2005

Position: Mechanical Engineer
Foster Manufacturing Company, Inc.
Springfield, Missouri

Primarily focused on the manufacturing and design of pneumatic and hydraulic quick disconnect couplings. Duties included new product design, machine design, product testing, continuous improvement of existing processes, process documentation, production maintenance and new manufacturing process development.

November 2000 to December 2001

Position: Reserve Patrol Officer
St. James Police Department
St. James, Missouri

October 1997 to December 2001

Position: Captain
Rolla Rural Fire Protection Association
Rolla, Missouri

III. Professional Registration

Registered Professional Engineer in the States of Missouri, Illinois, Arkansas, Kansas, Kentucky, Iowa, Alabama, and Oklahoma, Missouri License No. PE-2008019570.

Certified Fire and Explosion Investigator (NAFI-CFEI), National Association of Fire Investigators, Registration No. 15066-9476.

Certified Fire Investigator (IAAI-CFI), International Association of Arson Investigators [National Board on Fire Service Professional Qualifications Certified], Certificate No. 10-013024.

Licensed Private Fire Investigator in the State of Missouri, License No. 2014038149.

Federal Aviation Administration, Airman Certificate, Remote Pilot, Small Unmanned Aircraft System, Certificate No. 4061880.

IV. Professional Affiliations

Society of Automotive Engineers (SAE)
American Society of Mechanical Engineers (ASME)
National Society of Professional Engineers (NSPE)
National Fire Protection Association (NFPA)
 NFPA 211: Standard for Chimneys, Fireplaces, and Venting Systems for Heat-Producing
 Appliances Technical Committee, Principal, 2015 – Present
 NFPA 921: Guide for Fire & Explosion Investigations
 2020 Heating Systems Task Group, 2017
International Association of Arson Investigators (IAAI)
National Association of Fire Investigators (NAFI)
International Association of Forensic & Security Metrology (IAFSM)

V. Patents & Publications

Cerrano, Jason & Metzger, Todd; *Methods and apparatus for performing emergency extrications*;
United States Patent 6,722,176; April 20, 2004

Bicknese, Randy & Metzger, Todd; *Type HT Factory Built Chimneys in Relationship to Cellulose
Insulation*; International Symposium on Fire Investigation Science and Technology Proceedings;
October, 2012

VI. Continuing Education

1998 – Missouri Division of Fire Safety/NFPA 1001-1992 Fire Fighter I & II
 Rolla Rural Fire Protection Association, Rolla, Missouri
1999 – Hazardous Materials Incident Response – Awareness
 Fire and Rescue Training Institute, Rolla, Missouri
1999 – Emergency Response to Terrorism
 Federal Emergency Management Agency, Rolla, Missouri
2000 – Crime Scene Management for Fire and EMS
 Fire and Rescue Training Institute, Columbia, Missouri
2000 – Vehicle Accident Incident Management
 Fire and Rescue Training Institute, Columbia, Missouri
2000 – Explosive Recognition and Bomb Threat Management
 Fire and Rescue Training Institute, Columbia, Missouri
2001 – Fundamentals Course for Radiological Monitors
 State of Missouri Emergency Management Agency, Rolla, Missouri
2001 – Missouri Department of Public Safety – Class B Certification
 Missouri Sheriff's Training Academy, Fort Leonard Wood, Missouri
2003 – Principles of Becoming a Lean Enterprise
 Missouri Enterprise, Springfield, Missouri
2004 – ProtoTRAK SL Training Program
 Southwestern Industries, Inc., Springfield, Missouri
2006 – OSHA 10-hour Construction Safety & Health Training Course
 ClickSafety, St. Louis, Missouri
2008 – Post-Blast Explosion Investigations
 IAAI-IL, Champaign, Illinois

Continuing Education (continued):

- 2008 – Evidence Collection & Laboratory Analysis
IAAI-IL, Champaign, Illinois
- 2008 – Ethics for Engineers
Missouri University of Science & Technology, Chesterfield, Missouri
- 2008 – Investigation of Appliance Fires
Fire Findings Laboratories, Benton Harbor, Michigan
- 2009 – Technical Writing Workshop for Engineers
HalfMoon LLC, Clayton, Missouri
- 2009 – Understanding Post-flashover Fire Behavior
IAAI-AR, Eureka Springs, Arkansas
- 2009 – Investigating Solid Fuel-Burning Appliance Fires
Fire Findings Laboratories, Benton Harbor, Michigan
- 2010 – Stove Fires Intentional or Accidental?
IAAI-IL, Collinsville, Illinois
- 2010 – Origin Determination, Cause Determination, Incendiary Fire Analysis, and New Techniques
in Fire Investigation
IAAI-IL, Collinsville, Illinois
- 2010 – Court Testimony
IAAI-IL, Collinsville, Illinois
- 2010 – Kinesic Statement Analysis Technique
IAAI-IL, Champaign, Illinois
- 2010 – Fundamentals of Residential Building Construction
IAAI, CFITrainer.net
- 2011 – Glock Professional, Inc. Armorer’s Certification
Overland Police Department, Overland, Missouri
- 2011 – Communication and Customer Relationship Management
T&T Training, Wentzville, Missouri
- 2011 – Fire Scene Photography
IAAI-IL, Collinsville, IL
- 2011 – NFPA 921 Updates
IAAI-IL, Collinsville, IL
- 2011 – Gas Explosions & Practical Electric
IAAI-IL, Collinsville, IL
- 2011 – Fire Investigation and Burn Cells
Grinell Mutual, Belleville, IL
- 2011 – 2011 NFPA 921: Fire and Explosion Investigations
NFPA, St. Louis, MO
- 2012 – National Fire, Arson & Explosion Investigation Training Program
NAFI, St. Charles, MO
- 2012 – The Investigation of Kitchen Systems
IAAI-IL, Fairview Heights, IL
- 2012 – International Symposium on Fire Investigation Science and Technology
NAFI, University of Maryland – University College, College Park, Maryland
- 2013 – Asbestos Operations & Maintenance Training
Environmental Safety Training Center, Wentzville, MO
- 2014 – Explosions & Case Studies
IAAI-IL, Fairview Heights, Illinois

Continuing Education (continued):

- 2014 – NFPA 921, Legal Precedents and Common Sense
IAAI-IL, Fairview Heights, Illinois
- 2014 – Detecting Deception in Interviewing
IAAI-IL, Fairview Heights, Illinois
- 2014 – Asbestos Operations & Maintenance Refresher Training
Environmental Safety Training Center, Wentzville, MO
- 2015 – NFPA 13 (2013) Series Online Program
NFPA, Wentzville, MO
- 2015 – Asbestos Operations & Maintenance Refresher Training
Environmental Safety Training Center, Wentzville, MO
- 2016 – Burn Modules: Classroom & Practical
IAAI-IL, Swansea, IL
- 2016 – Juvenile Fire Setters & Interactive Video Conference
IAAI-IL, Swansea, IL
- 2016 – NFPA 1033 Knowledge Points
IAAI-IL, Swansea, IL
- 2016 – Federal Rules
IAAI-MO, Lake Ozark, MO
- 2016 – NFPA 1033
IAAI-MO, Lake Ozark, MO
- 2016 – Lightning Strike Fires
IAAI-MO, Lake Ozark, MO
- 2016 – Vehicle Fire Analysis with Burn Demonstrations
IAAI-AR, Heber Springs, AR
- 2016 – Arc Mapping with Burn Demonstrations
IAAI-AR, Heber Springs, AR
- 2016 – Agricultural Equipment Fires
IAAI-AR, Heber Springs, AR
- 2016 – Chimney Fires
IAAI-AR, Heber Springs, AR
- 2017 – Asbestos Operations & Maintenance Refresher Training
Environmental Safety Training Center, Wentzville, MO
- 2017 – Metallurgy and Fire Investigations
Will-Cook Grundy Country Fire Investigation Task Force, Tinley Park, IL
- 2017 – FARO Scanner and Scene Forensics Certified Training
Bobby Jones Associates, Inc., Wentzville, MO
- 2017 – Part 107 Small Uas Training
RemotePilot101.com, Wentzville, MO
- 2018 – Asbestos Operations & Maintenance Refresher Training
Environmental Safety Training Center, Wentzville, MO
- 2018 – Agricultural Equipment Fires
IAAI-AR, Fayetteville, AR
- 2018 – Gas Fire Appliances
IAAI-IL, Swansea, IL
- 2018 – Utilizing Open Source Social Media Avenues for Investigative Purposes
IAAI-IL, Swansea, IL

Continuing Education (continued):

- 2019 – Asbestos Operations & Maintenance Refresher Training
Environmental Safety Training Center, Wentzville, MO
- 2019 – Aerial Lift Operating Training, Federal OSHA Regulation 29CFR 1910.67
Safety Training Resources LLC, Wentzville, MO
- 2019 – What’s New in Kirk’s Fire Investigation, 8th Edition
IAAI-IL, Caseyville, IL
- 2019 – Working at Heights (Fall Protection), Federal OSHA Regulation 29CFR 1926.500 Subpart M
Safety Training Resources LLC, Wentzville, MO
- 2019 – Forklift Operation
Safety Training Resources LLC, Wentzville, MO
- 2019 – Introduction to Residential Solar Systems
IAAI-MO, Springfield, MO
- 2019 – Introduction to Materials and Metallurgy
IAAI-MO, Springfield, MO
- 2019 – Electrical Appliance & Device Fires
IAAI-MO, Springfield, MO
- 2019 – Part 107 Small Uas Recurrent Training
RemotePilot101.com, Wentzville, MO
- 2019 – Photogrammetry and Analysis of Digital Media
SAE International, Troy, MI
- 2020 – Asbestos Operations & Maintenance Refresher Training
BluSky, Wentzville, MO
- 2020 – Morals, Ethics, and Integrity
NSPE-MO, Wentzville, MO
- 2020 – 2017 NFPA 25: Inspection, Testing, and Maintenance of Water-Based Fire Protection
Systems Online Training Series
NFPA, Wentzville, MO
- 2020 – The Future is Here: Next Generation Scene Documentation, Evidence Preservation, & Case
Presentation Using Matterport
NASP, Wentzville, MO
- 2020 – HVAC Design
RedVector, Wentzville, MO
- 2020 – Commercial HVAC Systems Essentials
RedVector, Wentzville, MO
- 2020 – Preventing Mold Growth
RedVector, Wentzville, MO
- 2020 – Explosion Dynamics
IAAI, CFITRainer.net
- 2020 – Past, Present and Future of Building Energy Codes and DOE Appliance Mandates
RedVector, Wentzville, MO
- 2021 – Asbestos Operations & Maintenance Refresher Training
BluSky, Wentzville, MO
- 2021 – Telehandler Operation (Classroom & Practical Skills)
Safety Training Resources LLC, Wentzville, MO
- 2021 – Understanding Fire Sprinkler Drawings and Calculations
RedVector, Wentzville, MO

Continuing Education (continued):

- 2021 – Building Design and Construction Features for Fire Protection
RedVector, Wentzville, MO
- 2021 – Commercial Building MEP Design
RedVector, Wentzville, MO
- 2021 – Fire Essentials and Fire Science
RedVector, Wentzville, MO
- 2021 – Combustion Analysis
RedVector, Wentzville, MO
- 2021 – Natural Gas Systems – Sizing and Design Consideration
RedVector, Wentzville, MO
- 2021 – Fuel and Combustion Systems Safety – Gas Supply System Issues
RedVector, Wentzville, MO
- 2021 – Part 107 Small Uas Recurrent Training
FAA Safety Team Aviation Learning Center Online, Wentzville, MO
- 2021 – Engineering Ethics and the Law
NSPE, Wentzville, MO
- 2022 – Asbestos Operations & Maintenance Refresher Training
BluSky, Wentzville, MO
- 2022 – HDD Online Course
DitchWitch University, Wentzville, MO
- 2022 – HVAC Propane Safety Compliance Training
Missouri Propane Education & Research Council, St. Louis, MO
- 2022 – Engineering: Addressing Unintended Consequences as a Professional
NSPE, Wentzville, MO
- 2022 – Thermometry, Heat, and Heat Transfer
IAAI, CFITRainer.net
- 2022 – Playing With Fire Without Being Burned – Fire Investigation and Fire Modeling
NASP, Marco Island, FL
- 2022 – What Do Pipes, Grass and the Beach Have in Common...Plastics!
NASP, Marco Island, FL
- 2022 – Current Trends In Digital Media
NASP, Marco Island, FL
- 2022 – The Imitation Game – Using Exemplars For Product Examinations
NASP, Marco Island, FL
- 2022 – Our Sprinkler System Destroyed Our Building – Who Is To Blame?
NASP, Marco Island, FL
- 2022 – Understanding the Subrogation Potential with Fire Protection and Life Safety Systems
NASP, Marco Island, FL
- 2023 – OSHA Class III – Asbestos Operations and Maintenance Refresher
The Asbestos Institute, Wentzville, MO
- 2023 – Part 107 Small Uas Recurrent Training
FAA Safety Team Aviation Learning Center Online, Wentzville, MO
- 2023 – Fire Flow Analysis
IAAI, CFITRainer.net
- 2023 – Understanding Undetermined
IAAI, CFITRainer.net

Continuing Education (continued):

- 2023 – The Impact of Ventilation in Building Structures on Fire Development
IAAI, CFITRainer.net
- 2023 – Fire Investigator Scene Safety
IAAI, CFITRainer.net
- 2023 – Using Resources to Validate your Hypothesis
IAAI, CFITRainer.net

VII. Courses Taught

- Cellulose Insulation in Relation to Factory-Built Fireplaces and Chimneys – October, 2010
IAAI-AR, Fayetteville, Arkansas
- Cellulose Insulation in Relation to Factory-Built Fireplaces and Chimneys – January, 2011
IAAI-IL, Mokena, Illinois
- Cellulose Insulation in Relation to Factory-Built Fireplaces and Chimneys – June, 2011
IAAI-MO, Lake Ozark, Missouri
- An Introduction to CSST Gas Piping – September, 2011
Grinell Mutual, Belleville, IL
- Cellulose Insulation in Relation to Factory-Built Fireplaces and Chimneys – May, 2012
IAAI-IL, Collinsville, IL
- International Symposium on Fire Investigation Science and Technology, Delegate – October, 2012
NAFI, University of Maryland – University College, College Park, Maryland
- Basic Origin & Cause Training: The Engineer's Role – October, 2012
Midwest Consulting/Schaefer Engineering, Fairview Heights, IL
- Cellulose Insulation, Factory Built Fireplaces and Chimneys – March, 2014
CIFIA, Peoria, IL
- Cellulose Insulation & Type HT Chimney/IPad Scene Documentation – October, 2014
IAAI-AR, Eureka Springs, AR
- Residential Natural Gas Systems, Subject Matter Expert – 2014 & 2015
IAAI CFITrainer, CFITrainer.net
- Investigating Natural Gas Systems, Subject Matter Expert – 2014 & 2015
IAAI CFITrainer, CFITrainer.net
- Fireplace and Chimney Deficiencies: How Fires Start – June, 2016
IAAI-MO, Lake Ozark, MO
- Digital Documentation, Instructor's Assistant – June, 2016
IAAI-MO, Lake Ozark, MO
- Motor Vehicles: Parts I & II, Subject Matter Expert – 2016 & 2017
IAAI CFITrainer, CFITrainer.net
- Fireplace and Chimney Deficiencies: How Fires Start – February, 2017
Will-Cook Grundy Country Fire Investigation Task Force, Tinley Park, IL
- New Technology in Fire Investigation: Bits, Bytes, Flights, and More – April, 2018
IAAI-AR, Fayetteville, AR
- New Technology in Fire Investigation: Bits, Bytes, Flights, and More – May, 2018
IAAI-IL, Swansea, IL
- New Technology in Forensic Investigation: Bits, Bytes, Flights, and More – November, 2018
Evans & Dixon LLC, St. Louis, MO
- New Technology in Fire Investigation: Bits, Bytes, Flights, and More – May, 2019
IAAI-MO, Springfield, MO

Courses Taught (continued):

Investigation of Natural Gas Fires and Explosions – October, 2021

Professional Fire & Fraud Investigators Association, St. Charles, MO

Let's Get Physical – Considerations When Conducting Physical Experiments in Fire Investigations –
November 2022

NASP, Marco Island, FL

New Technology in Fire Investigation: Bits, Bytes, Flights, and More – February, 2023

CIFIA, Peoria, IL

VII. Awards

Firefighter of the Year, Rolla Rural Fire Department, 1998 & 1999

Presidential Certificate of Appreciation, International Association of Arson Investigators
May 19, 2015, Chicago, IL