

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

November, 2022

**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 – FARO Scanner and Scene Forensics Certified Training  
Bobby Jones Associates, Inc., 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
- 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

**Continuing Education (continued):**

- 2019 – What’s New in Kirk’s Fire Investigation, 8<sup>th</sup> 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 – 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
- 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

**Continuing Education (continued):**

- 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 – 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

**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  
Grinnell 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

**Courses Taught (continued):**

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

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

**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