



Curriculum Vitae

Christopher J. Brand, P.E.
Mechanical Engineer

Professional Practice

Chris Brand is an accomplished Mechanical Engineer with seventeen years combined experience in research and development engineering. He holds a BSE and MSME in mechanical engineering. His extensive experience with finite element analysis and computational fluid dynamics along with his understanding of mechanical and materials issues on the component level (including fasteners, bearings, gears, etc.) provide him with a strong base for failure investigations.

Employment History

Mechanical Engineer – Crane Engineering

Plymouth, MN • 2012 - Present

Assist clients in understanding mechanical and materials issues on the component level, particularly with pressure bearing components, fasteners and welded joints. Utilize extensive experience and education in analyzing complex mechanical systems and their interactions from a strength of materials, analytical and numerical (i.e., Finite Element Analysis) perspective. Investigates accidents involving recreational equipment (e.g., Zip Lines). Help clients apply and interpret ASME and other mechanical codes and standards. Apply experience to clients' manufacturing process selection, geometric dimensioning and tolerancing (GD&T) issues and material selection. Specializes in analysis and modeling of fuel gas (e.g., natural gas and propane) leaks. Investigate accidents involving large machinery such as cranes, agriculture equipment and wind turbines. Provide consulting on industrial and commercial safety (e.g., machine guarding and walkway safety).

Principal Design/Development Engineer – Rosemount, Inc.

Eden Prairie, MN • 2005 - 2012

Led project teams from inception to conclusion. Served as an integral part of Vortex Flowmeter design team. Applied ASME and international codes (EN, JIS, DIN, etc.) to B31.3-Process Piping, B31.1-Power Piping and Boiler and Pressure Vessel Code, etc. Designed and Analyzed Process Piping Components. Created design specifications based on marketing needs. Utilized analytical and numerical tools for design.

Applications Engineer – Third Wave Systems, Inc.

Minneapolis, MN • 2000 - 2005

Analyzed and modeled machining and manufacturing processes. Designed systems and components for improving metal cutting operations. Created specifications for new software features. Managed and standardized material modeling practices and pricing. Streamlined customer support process, including developing a support database. Wrote CNC machine code for research projects.

Design and Manufacturing Engineering Intern – Magna Seating Systems

Livonia, MI • 1998 - 1999

Led fabrication of prototype seating buck for demonstrating the Saturn Vue. Designed fixtures for testing SUV seats. Coordinated work with machine shop and assembly technicians. Implemented design concepts for improved manufacturability. Created a manufacturing bill of materials database for the Ford Escape.

Research Assistant, University of Michigan Engineering Research Center – RMS

Ann Arbor, MI • 1999

Designed apparatus for accuracy and precision measurement of fasteners. Performed cutting tests for “stability prove-out” of fixtures. Conducted wear tests for drilling operations.

Professional Licenses

Licensed Professional Engineer

Minnesota and Wisconsin

Professional Affiliations

American Society of Mechanical Engineers (ASME) – Member

National Floor Safety Institute (NFSI) – Member

Walkway Auditor Certificate Holder (WACH), National Floor Safety Institute (NFSI)

Northwest Loss Association, Inc. – Member

American National Standards Institute (ANSI), B101.4 Subcommittee

Education

MSME, Mechanical Engineering, University of Minnesota, Minneapolis, MN, 2009

BSE, Mechanical Engineering, Magna Cum Laude, University of Michigan, Ann Arbor, MI, 2000



Continuing Studies

NFSI Walkway Auditor Certificate Holder Program (WACH) ANSI Accreditation Class, Southlake, TX, 2014.

Product Failure Mechanisms, ASME Section Meeting, Plymouth, MN, 2014.

Essentials-B30 Safety Standard, ASME, 2014.

8-Hour Hazardous Waste Site Worker Refresher Course (Hazwoper), Minneapolis, MN, 2014.

Symmetry Solutions: Solid Works Flow Training, 2014.

Practical Applications of Drones for PEs, MNSPE, 2013.

TCCA Presentation on Walkway Auditing, TCCA, 2013.

40-Hour Hazardous Waste Site Worker Training Course (Hazwoper), Minneapolis, MN, 2013.

NFSI Walkway Auditor Training, 2013.

BOT-3000 Presentation to Crane Companies, Plymouth, MN, 2013.

EAG: Intro to Analytical Techniques, 2013.

ANSYS Mechanical Structure Nonlinearities, 2012.

PED Presentation, Rosemount Inc., 2012.

Presentations and Publications

“Virtual Testing: Use of Computer Simulation for Better Products”, Crane Engineering Smart Sessions, Plymouth, MN, 2018.

“More Than Just a ‘Pretty Picture’: Use of Finite Element Analysis in Failure Analysis”, ASM International – Minnesota Chapter, Hennepin Technical College, Brooklyn Park, MN, 2017.

Brand, CJ, *Computational Fluid Dynamics: It’s Not Just for NASA Anymore*, Crane Engineering Newsletter, 2016.

Brand, CJ, “Flanged Reducer Vortex Flowmeter”, Patent No. 9,016,138, Issued: Apr. 28, 2015.

Forensic Testing for Tank System Failures, 27th Annual Environmental and Ground Water Quality Conference, Pierre, SD, 2015.

Brand, CJ, *Managing Slippery Slopes: Recent Developments in Measurement of Walkway Slip Resistance*, Twin Cities Claims Association (TCCA), Bloomington, MN, 2013.

Foster, JD, Brand, CJ, Graber, WF, “Leak Check Device for Vortex Sensor Replacement”, Patent No. 7,637,170, Issued: Dec. 29, 2009.

Aijarapu, SK et al, *Ductile Regime Machining of Silicon Nitride: A Numerical Study Using Drucker-Prager Material Model*, 2003, Proceedings of the Third National Conference on Precision Engineering.



Marusch, TD, Thiele, JD, Brand, CJ, *Simulation and Analysis of Chip Breakage in Turning Processes*, 2002, Proc. of the 5th CIRP International Workshop on Modeling of Machining Operation, pp. 139-148.

Kumbera, TG, Cherukuri, HP, Patten, JA, Brand, CJ, Marusch, TD, 2001, *Numerical Simulation of Ductile Machining of Silicon Nitride with a Cutting Tool of Defined Geometry*, Proceedings of the 4th CIRP International Workshop on Modeling of machining operations, p. 7.

