



## CURRICULUM VITAE

# NATHAN MACDONALD

Mechanical Engineer | Expert Witness

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## PROFESSIONAL SUMMARY

Patent Litigation (Utility & Design) | Mobile Hydraulic Equipment | Walkway safety | Amusement Rides & Devices | Fitness Equipment

Mechanical engineer, licensed Professional Engineer, and Certified Safety Professional with extensive experience in forensic engineering, product design, and expert witness services. Retained as an expert in matters involving product liability, premises liability, intellectual property, and catastrophic injury and fatality. Specialized expertise includes hydraulic access equipment (scissor lifts, boom lifts, MEWPs, telehandlers), walkway safety including slips trips and falls, warnings and instructions, and patent litigation involving both utility and design patents.

Experienced in applying industry standards, conducting failure analysis and accident reconstruction, designing and executing custom testing, and providing deposition and trial testimony in state and federal courts.

## EXPERT WITNESS EXPERIENCE

- Personally retained as an expert witness in over 55 matters involving product liability, premises liability, intellectual property, and catastrophic injury and fatality
- Offered testimony by **deposition on 11 occasions** and at **trial on 2 occasions**, including in both personal injury and patent litigation
- Served as lead associate engineer and senior technical reviewer on **more than 100 additional matters**
- Experience retained by both plaintiff and defense counsel
- Provided opinions addressing design defects, manufacturing defects, warnings and instructions, standards compliance, causation, and damages

## AREAS OF EXPERTISE

### Patent Litigation (Utility & Design)

- Infringement and non-infringement analyses
- Validity and invalidity analyses
- Claim construction support
- Prior art searches and comparisons
- Functionality versus ornamentality analyses for design patents
- Experience supporting matters before the PTAB and U.S. District Courts

## AREAS OF EXPERTISE (CONTINUED...)

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### Mobile Hydraulic Equipment & Material Handling

- Scissor lifts, aerial boom lifts, MEWPs, and telehandlers
- Hydraulic circuit design and failure modes
- Stability, load paths, and tipping analysis
- Operator training, warnings, and instructions
- OSHA and ANSI compliance

### Walkway Safety, Slips Trips and Falls

- Slip resistance testing and analysis
- Static and dynamic coefficient of friction evaluation
- Effects of contamination, wear, and surface condition
- Application of ASTM and ANSI standards
- Human factors related to slips, trips, and falls

### Forensic Engineering & Failure Analysis

- Failure reconstruction
- Mechanical and structural failures
- Fatigue and fracture analysis
- Design versus misuse evaluations
- Standards-based opinions and methodology
- Warnings analysis and human factors related to injuries and fatalities

### Amusement Rides and Devices

- Design, testing, and certification
- Structural and safety analysis
- Writing and review of manuals and maintenance procedures

### Exercise and Fitness Equipment

- Design, testing, and certification
- Structural and safety analysis
- Proper maintenance of exercise equipment

- Professional Mechanical Engineer (PE) – Utah
- Certified Safety Professional (CSP)
- Certified Tribometrist (English XL Tribometer)
- Certified Commercial Building Inspector
- Certified Operator Trainer
  - Counterbalance Forklifts
  - Aerial Boom Lifts
  - Scissor Lifts
  - Telehandlers
- Certified Counterbalance Forklift Operator

## LICENSURE & CERTIFICATIONS

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## EDUCATION

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### Bachelor of Science in Mechanical Engineering

Brigham Young University - 2009 - 2014

Academic Scholarship multiple years

## PATENTS & INTELLECTUAL PROPERTY EXPERIENCE

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- Named inventor on U.S. Patent No. 12,311,230, Electromechanical Exercise Machine
- Contributor to multiple additional patent applications
- Extensive experience with patent prosecution, including drafting patent specifications, figures, and working with patent attorney on drafting claims; participating in Patent Examiner interviews; and supporting responses to office actions
- Performed numerous infringement, validity, claim construction, and prior art analyses involving both utility and design patents
- Rendered expert opinions in litigation support on patent infringement, validity, and claim interpretation
- Experience offering deposition and trial testimony in intellectual property disputes

## PROFESSIONAL EXPERIENCE

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### **Mechanical Engineering Consultant / Forensic Engineer**

- Lead engineer in the design and analysis of mechanical, electrical, pneumatic, and hydraulic systems
- Conducted forensic investigations involving equipment failures, accidents, and alleged design defects
- Designed and executed custom testing programs, including instrumentation, data collection, and statistical analysis
- Evaluated compliance with applicable ANSI, ASTM, ASME, OSHA, SAE, and ISO standards
- Provided expert reports, deposition testimony, and trial testimony

### **Representative Design & Engineering Experience**

- Hydraulic aerial boom lifts and electro-hydraulic control systems
- Scissor lifts and material handling equipment
- Isokinetic electromechanical exercise machines, massage equipment, weightlifting machines, and the like
- Automated and semi-automated drill pipe cleaning and inspection machinery
- Amusement and recreational devices including zip lines, drop rides, slingshot rides, canyon swings, and pendulum rides
- Consumer and industrial products incorporating mechanical, electrical, and hydraulic systems

## STANDARDS & METHODOLOGY

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- Application of ANSI, ASTM, ASME, OSHA, SAE, and ISO standards
- Slip resistance testing using recognized tribometric methods
- Load, fatigue, and cycle testing
- Accelerometer and vibration testing
- Drop, impact, and dynamic testing
- Evaluation of warnings, instructions, and training materials
- Statistical analysis of test data

## PEER-REVIEWED PUBLICATIONS

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## PRESENTATIONS PODCASTS & PROFESSIONAL PUBLICATIONS

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## CONTINUING EDUCATION

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## CONSULTING FOCUS AND EXPERIENCE (NON-EXHAUSTIVE)

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- International Journal of Polymer Analysis and Characterization  
“Technique for Measuring the Low Pull-Out Forces of Bonded Fibers – Application to Glue-Based False Eyelashes”

- The Expert Witness Podcast – Episode 15 - “The Role of Expert Witnesses in Patent Litigation”
- Forklift Accidents: Expert Witness Insights on Causes and Prevention
- Cautions About Warnings
- Defending Against the Common Patent Troll
- Basics of Fatigue Calculations for Equipment Design and Safety
- OSHA 30-Hour Outreach – General Industry (including machine guarding)
- Utah Safety Council – Slips, Trips, and Falls
- OH&S – AI-Powered Forklift Collision Avoidance
- Scholarship and Research Integrity (CITI Program)
- InterNACHI Ethics
- InterNACHI Ladder Safety
- InterNACHI Egress Inspection
- InterNACHI – 25 Standards Every Inspector Should Know
- Utah Safety Counsel - Machine Guarding & Conveyor Safety
- Cal/OSHA - Preventing Slips, Trips, and Falls
- Cal/OSHA - Hazard Communication (HazCom)
- Aerial lifts, Scissor lift, forklift, boom lift, and telehandler design, maintenance, and operator training
- Premises liability involving slip, trip, and fall incidents, Tribometry and walkway safety
- Parking lot drainage and water management
- Fall arrest and restraint systems
- Amusement rides and recreational facilities
- Fitness equipment and load-bearing components
- Consumer products and household equipment
- Industrial machinery and automated systems
- Consumer products
- Warnings, instructions, and training adequacy

**Expert witness services provided nationwide. Case list and references available upon request.**