



CURRICULUM VITAE  
**NATHAN MACDONALD**

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## PROFILE

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Experienced mechanical engineering consultant with a Bachelor of Science in Mechanical Engineering. Lead engineer on the design and analysis of numerous products, including ziplines, exercise equipment, drop rides, slingshot rides, aerial lifts, trailers and towing equipment, automated drill pipe handling systems, and other hydraulic, pneumatic, electronic systems and equipment. Licensed Professional Mechanical Engineer (PE) in Utah, Certified Safety Professional (CSP) in comprehensive practice. Certified Commercial Building Inspector, Licensed operator and trainer for forklifts, telehandlers, and MEWP's such as aerial lifts, scissor lifts, and boom lifts.

Familiar with reading, interpreting, and using standards in the engineering design process including, ANSI, ASTM, OSHA, SAE, and ISO standards. Evaluated the cause of component failures in multiple industries. Experienced in automated and semi-automated systems, warnings, training, and property drainage inspections.

Experienced expert witness. Retained expert or lead associate on over 120 cases including 55 patent suits, 70+ product liability and personal injury cases, and multiple contract dispute cases. Experienced in product liability, personal injury, premises liability, and catastrophic injury and death cases. Experienced with designing, building and using custom testing devices, including instrumentation, to test performance, failure and compliance with standards.

## CERTIFICATIONS

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- Professional Mechanical Engineer (PE)
  - Utah License # 11829303-2202
- Certified Safety Professional (CSP)
  - Comprehensive Practice License #CSP-38229
- Certified Commercial Building Inspector (Cert. No. 9679028)
- Certified Forklift Operator
- Certified Counterbalanced Forklift Operator Trainer
- Certified Rough Terrain Forklift Operator Trainer
- Certified Aerial Boom Lift Operator Trainer
- Certified Aerial Work Platform (Scissor Lift) Operator Trainer

## EDUCATION

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### Bachelor's of Science - Mechanical Engineering

2009-2014

Brigham Young University - Provo

Academic Scholarship

Performed consulting work for over 12 years on a wide variety of topics. Major areas of focus and expertise include:

#### Amusement Rides and Devices

- ziplines, drop rides, slingshot rides, swing rides, pendulum rides, alpine slides, mountain coasters, roller coasters, water slides, mechanical bulls, stunt pad free fall jump, go-karts, slides, swings, and other playground equipment, interactive amusement ride experiences, basketball standards

#### Exercise Equipment

- Multiple isokinetic electromechanical exercise machines including structural analysis, finite element analysis (FEA), electrical design, physical prototyping and testing.
- Home gym and commercial equipment designs
- Massage equipment and knee braces
- Tension testing of cables, webbing, carabiners, and other tensile elements

#### Forklifts, Telehandlers, Mobile Elevating Work Platforms

- High voltage insulated aerial lifts, fiber optic controls for aerial lifts, finite element analysis (FEA) for static and fatigue, bucket elevators, etc.

#### Other Products

- Printing presses, automated drill pipe handling systems, spool lifts, beer dispensary trailers, pneumatic trailers, aerospace stands and lifts, mining equipment, simulators, adjustable racing seats, recycling equipment, video wall screen lifts, hitch testing, etc.

Extensive experience with the patent system including both patent prosecution and patent litigation. Drafted multiple patents including specification, figures, and worked with attorneys on drafting claims. Participated in interviews with the examiner and other tasks associated with the patent prosecution process. Named inventor on two patent applications currently pending.

Performed numerous infringement analyses, validity analyses, prior art searches etc. Rendered opinions on numerous disputes with respect to claim construction. Experienced working on IPR's before the PTAB and patent disputes in various district courts.

## CONSULTING FOCUS

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## PATENTS

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## **EXPERT WITNESS**

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Personally retained as an expert on 36 patent, personal injury, and contract dispute cases. Multiple testimonies in deposition and court. Worked as lead associate to retained expert on 93 cases. Responsibilities included: performing inspections, drafting reports, performing testing, calculations, statistical analysis and simulations.

Performed numerous analyses for patent litigation including infringement, validity, claim construction, etc. involving a wide variety of products such as:

- ladders, urinal screens, phone grips, false eyelashes, cervical collars, decorative log siding, adjustable desks, cigarette machines, hammocks, boat covers, rock crushing machinery, landscaping equipment, agricultural equipment, fasteners, coolers, blenders, consumer products, automotive components, and more.

Experienced in claim construction and interpretation both of utility patents and design patents.

Performed accelerometer testing on various amusement rides and devices including ziplines, stunt pads, inflatables, and more. Evaluated the cause of component failures in multiple industries including carabiners, webbing, step stools, and more.

Evaluated instructions, manuals, and warnings related to multiple types of equipment. Experienced in hazard analysis and risk evaluation as well as generating and evaluating safer alternative designs.

## **PEER REVIEWED PUBLICATIONS**

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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

## **PODCASTS, BLOG ARTICLES, AND OTHER PUBLICATIONS**

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- Cautions about Warnings
- Basics of Fatigue Calculations for Equipment Design and Equipment Safety