

G3 Genuine Guide Gear Inc.

Customer Success Story

Autodesk® Algor® Simulation

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—Cameron Shute
Product Development Engineer
G3 Genuine Guide Gear Inc.

Safe gear for ski guides.

North Vancouver–based G3 Genuine Guide Gear develops an award-winning ski binding with Autodesk® Algor® Simulation software.



Image courtesy of G3 Genuine Guide Gear Inc.

Project Summary

G3 Genuine Guide Gear Inc. (G3) of North Vancouver, British Columbia, Canada, is a specialized manufacturer of backcountry ski and safety equipment designed for guides and avalanche professionals. “If you’re a guide in the backcountry, other peoples’ lives can depend on the gear that you choose,” says Cameron Shute, G3 product development engineer. That’s why G3 uses Autodesk® Algor® Simulation software to help ensure the safety and effectiveness of its products, including skis, telemark bindings and accessories, climbing skins, avalanche probes, and backcountry shovels and saws.

For one G3 product, the TARGA Ascent telemark ski binding, Shute performed linear static stress simulations to validate and optimize all of its components. “Autodesk Algor Simulation displacement and stress results gave us confidence that we were in the ballpark of a successful design before we actually fabricated and physically tested the binding,” says Shute. “We went through many iterations and tests on this product, but Autodesk simulation technology helped get it to market quickly.” The TARGA Ascent has won multiple ski industry awards, including the prestigious ISPO Outdoor Award (presented at the largest general sporting goods show in Europe) for best outdoor innovation in the hardware category, *Skiing Magazine*’s Best in Test, and *POWDER Magazine*’s Skier’s Choice.

The Challenge

Founded in 1995, G3 has earned a reputation for developing and manufacturing innovative, dependable guide gear for the backcountry ski market. “Our product innovations are inspired by combining many years of skiing experience and product design,” says Shute.

G3 uses SolidWorks® software for design in conjunction with Autodesk simulation technology for design validation and optimization. “I open the native SolidWorks files in Autodesk Algor Simulation software and find that my data translates fine,” says Shute. “We then perform linear static stress simulations on the structural components of every product.”

Shute explains his role: “I bring backcountry skiing products to market, from initial concepts to final manufactured products and all steps in between. Currently, I’m a project manager, but I’m still heavily involved in the technical aspects of design, including simulation, materials, and testing.”

Autodesk®

Shute's experience in simulation includes college-level instruction. "I took a course at the University of Alberta on finite element analysis, but it was a fundamental course on understanding how the finite element method works rather than focusing on applications of simulation within the design process. I've also used simulation software from ANSYS and SolidWorks; however, I find Autodesk Algor Simulation software to be much more intuitive and feel like I have much more of an understanding of each step of the simulation workflow."

In addition, Shute has taken advantage of Autodesk education and training materials and services. "I attended an Algor Simulation training course, which further helped my understanding of simulation software. But, mostly, I've learned what I need to know to get my job done by working with the tutorials, online documentation, and an occasional call to Autodesk technical support. Autodesk is there to support my learning—when and how I need it."

Shute describes the benefits of using Autodesk Algor Simulation software: "For me, it's the ability to control my meshing with lots of options for fine-tuning and refinement of critical areas. We definitely save time and money by being a step ahead when we digitally prototype concepts. Autodesk Algor Simulation allows us to have a general sense of the relative strengths of parts in an assembly so we can do some initial optimization of part designs before committing to physical prototyping. We often know where parts are going to start breaking in tests like fatigue and can focus on those areas when inspecting tests. For the cost of the software, we receive great value."

Autodesk Algor Simulation Meets the Challenge

Shute used Autodesk Algor Simulation software to validate and optimize all components of G3's TARGA Ascent telemark ski binding. "Unlike alpine skiing equipment, the skis used for telemarking—or free-heel skiing—have a binding that only connects the boot to the ski at the toes, much like in cross-country skiing," explains Shute. "However, cross-country products are lighter and used mainly for flatter terrain with little or no downhill performance. Telemark bindings are more heavy-duty to withstand the increased forces encountered in high-speed descents. They allow skiers to execute fluid turns and provide good performance for both touring and downhill skiing."

The TARGA Ascent provides a pole-activated free pivot system, easily switching the binding from tour to ski mode. In tour mode, the Ascent toeplate pivots unrestricted on a stainless steel axle, eliminating the burden of boot flex resistance for a natural feel and efficient stride. A flick of the switch easily converts the Ascent into ski mode where a stainless steel sliding retainer moves into place above a forged stainless steel retention bar, allowing outstanding downhill control.

"Our design goals for the Ascent were that it must be strong, light, reliable, and functional," says Shute. To help achieve those goals, Shute applied Autodesk simulation technology. "We used Autodesk Algor Simulation software extensively to optimize the weight and strength of structural plastic and metal components as well as elastomers for damping and spring force. This included the solving of many interesting design problems, like flexible tabs calculations and spring force estimates."

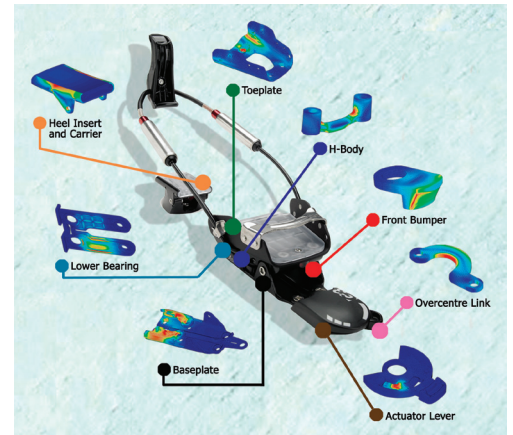


Image courtesy of G3 Genuine Guide Gear Inc.

The Result

The G3 TARGA Ascent is now in production and available at select retailers worldwide. "The Ascent is telemark's lightest (1,400 grams or 49.4 ounces), high-performance touring binding," says Shute. "Professional explorers and guides choose G3 TARGA Ascent bindings because they are built to stand up to today's big boots and aggressive skiers."

For more information about Autodesk Algor Simulation software, visit www.autodesk.com/algor simulation.



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