CASE STUDY

GEMSTAR MANUFACTURING

FROM METAL TO PLASTIC: HOW GEMSTAR HELPED GRAVIRAX RE-ENGINEER A KEY PRODUCT

Gravirax is an outdoor gear company known for manufacturing heavy-duty ski and snowboard racks that make mountain travel easier, safer, and more convenient for outdoor enthusiasts. Their products are engineered to offer reliable ground-level loading and secure transport, allowing customers to hit the slopes with confidence.

As Gravirax's popularity grew and more customers adopted their rack systems, it became clear that one particular product — the steel snowboard rack — was due for a redesign. While the original design had served its purpose well, its weight, assembly requirements, and susceptibility to denting and rust presented opportunities to refine the design.

As a seasonal business with a single production window each year, Gravirax had limited opportunity to experiment with new designs and manufacturing methods. Any delay risked pushing development into the following season. The Gravirax team recognized the product's potential and understood that reaching its next phase would require additional engineering depth and manufacturing expertise beyond what they had internally.
That search led them to Gemstar.

A PRODUCT WITH POTENTIAL

The original snowboard rack was fabricated from multiple steel pieces that had to be manually riveted together. Each additional piece increased labor costs and extended finishing time. While the rack appeared rugged, it dented easily in harsh winter environments and offered no opportunity for branding.

Gravirax had early design concepts for a more efficient solution, but the constraints of steel narrowed their options. As a small, seasonal company, timing mattered just as much as design. They explored alternatives, including injection molding, but quickly learned that the process imposed significant constraints on part geometry, wall thickness, and design flexibility. Other molders warned that transitioning from steel to plastic would take too long, or that it simply couldn't be done within the timeline Gravirax needed.

What Gravirax needed next wasn't just a new process, but a partner with the engineering depth to rethink both the material and the design from the ground up. That's where Gemstar came in.

> ***"This whole experience has been a win for us and a complete win for domestic U.S. manufacturing"***
>
> - Carl Walker, General Manager of Gravirax

BEFORE
Steel pieces riveted together

AFTER
Rotationally molded redesign

THE PARTNERSHIP: MAKING THE "IMPOSSIBLE" TIMELINE POSSIBLE

Gemstar realized that while injection molding was not the right fit, rotational molding offered the durability, design freedom, and branding capability Gravirax was looking for. More importantly, it aligned with their production reality.

Gemstar's engineering team moved quickly, taking Gravirax's concept and re-engineering it specifically for rotational molding. With engineering, tooling, and production all under one roof, decisions happened fast and iterations stayed on schedule. What might normally take a full year was completed in just six months.

When Gravirax reviewed the first prototype, they had no notes. None. Every design intention had been translated into a manufacturable, real-world solution.

> ***"We had drawings and ideas, but no internal resources to execute. Gemstar brought their full engineering team to the table. We couldn't have done this on our own."***
>
> - Carl Walker, General Manager of Gravirax

A MOLDED SOLUTION THAT WORKS HARDER IN EVERY WAY

Back of redesigned snowboard sleeve.

This project was not a simple material swap. It was a complete redesign shaped by a deep understanding of rotational molding. The original steel design relied on flat panels, sharp corners, and added metal components — all features that fight against molded manufacturing and limit performance.

The redesigned part was built with molding in mind. Geometry was reshaped to prevent warping during cooling, stress points were eliminated, and the form was engineered to support consistent wall thickness throughout. These decisions allowed the part to mold cleanly and perform reliably in real-world conditions.

Strength was designed directly into the part. High-load areas were reinforced through molded features rather than secondary components, reducing complexity while improving rigidity. Integrated ribbing and a contoured front lip added stiffness where it mattered most, delivering a product that feels solid without the weight of steel.

Moving to plastic also unlocked new branding opportunities. A large flat exterior surface became a functional design feature with a molded-in Gravirax logo that reinforces structure while clearly representing the brand. The finished product looks intentional, premium, and built to last.

Installation was simplified as well. Instead of flat contact points and separate brackets, the molded design incorporates features that nest directly around the rack tubing, ensuring consistent alignment every time. Critical mounting dimensions were built directly into the part, turning a multi-piece steel assembly into a single molded component with improved fit and no post-processing.

Hardware access followed the same philosophy. All fastening now happens from the top, eliminating awkward installation steps and improving the experience for both assembly teams and end users.

The result is a lighter, more durable product designed for harsh winter conditions. It won't dent or rust, and it absorbs impact without compromising performance. Customers immediately noticed the difference. The American-made durability stands out, and it's built to last more than one season.

Redesigned Gravirax snowboard sleeve easily attaches to the Gravirax Ski Rack.

> ***"Gemstar was more than just a PO. Everyone on the team made this feel easy."***
>
> - Carl Walker, General Manager of Gravirax

WHY GRAVIRAX CHOSE GEMSTAR

Other molders said the timeline was unrealistic. Gemstar said, **"Let's find a way."** What made the difference was Gemstar's ability to combine engineering depth with manufacturing execution:

- Rapid design iteration supported by in-house tooling
- Deep rotational molding expertise
- Flexibility to match a seasonal production schedule
- A genuine investment in the customer's success

For a company that prides itself on American manufacturing, finding a U.S. partner who could match their scale, speed, and ambition was critical. Gemstar brought everything under one roof: engineering expertise, advanced molding technology, and the proven ability to test the limits of what a plastic product can be.

THE IMPACT: A BREAKTHROUGH SEASON AND A RUNWAY FOR FUTURE GROWTH

This project marked a turning point. Gravirax now has:

- A scalable, profitable product
- A durable, branded design built for real-world use
- A domestic manufacturing partner they can rely on
- Confidence to grow without sacrificing quality

What started as a single, urgent challenge has become an ongoing partnership — one built on shared values, problem-solving, and a commitment to American-made excellence.

ABOUT GEMSTAR

Gemstar Manufacturing is an engineering-based solutions provider with over 60 years of manufacturing experience and knowledge. The company is a family-owned business supported internally by long-term employees. The firm's history is rooted in custom manufacturing, and the dedication of a customer-centric organization. Gemstar's mission is "to test the limits of plastic manufacturing and exceed the expectations of customers" which is shown through their dedication to provide value to customers through innovative design and technology.

READY FOR CUSTOM PART SOLUTION?

To learn more about Gemstar's manufacturing capabilities call us at **800-533-3631** or visit **GemstarMFG.com**.