Urethane Parts Help Exercise Equipment Manufacturer Meet Production Deadlines

With Solid Concepts' help, the Star Trac Elliptical EDGE was able to make it to market on time despite Star Trac's tooling delays.

Solid Concepts' QuantumCast™ Cast Urethane offers cast-in-color with optical color matching. Cast-in-color offers benefits beyond typical paint, yielding parts that have long lasting aesthetic appeal even after heavy use.

The new running and jogging trainer from Star Trac required three rubber components before it could be shipped. When tooling deliveries were delayed, the company turned to Solid Concepts for production level quantities of urethane components.

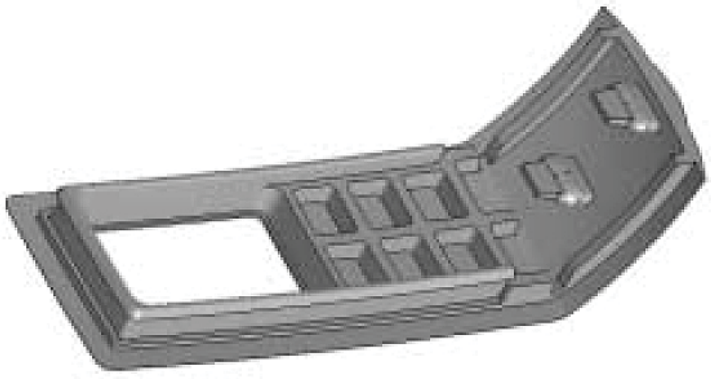
The Star Trac Elliptical EDGE™ touts a twenty-four inch power stride which allows the most natural and full-range of motion for non-impact running. Exercisers are able to recruit from various muscle groups, maximizing the challenge and effectiveness of their workout. Designing exercise equipment is extremely challenging and speed to market is a key element in its success. When Star Trac found the shipping of their Elliptical EDGE trainer was waiting for three essential rubber components, they had to move quickly.

Rubber foot pads and grommets were holding up the shipping of four hundred Elliptical EDGE trainers. The foot pads on the Elliptical Edge are essential components of the machine because of their intimate contact with the user and aesthetic appeal. The foot pads had to have the right texture, feel comfortable to the user, offer the appropriate wear characteristics, and provide a consistent look from one machine to another.

> *" Urethane materials have improved dramatically in the past few years," said Dave Crawley. "Coupled with the right procedures, Solid Concepts is able to produce parts that are indistinguishable from injection molded production parts in a fraction of the time it would take to produce the hard tooling needed for injection molded parts. For Star Trac, that meant they were able to complete the delivery of their new Elliptical EDGE Trainer despite the unexpected delay in producing the tooling."*

Typical procedures for manufacturing the foot pads include hard tooling. Star Trac, however, ran across trouble with the tooling. Several hundred units were sitting on the floor waiting for a grommet and left and right foot pads and an alternative production method had to be found quickly.

Solid Concepts, a leading supplier of rapid prototyping and manufacturing services, was called in to help alleviate the problem. Rapid prototyping service bureaus such as Solid Concepts typically provide quick turnaround for small quantities of parts. Solid Concepts has a wide range of rapid prototyping technologies available, but they recommended their QuantumCast™ Cast Urethane process to create the parts from silicone rubber tooling. According to the Solid Concepts' Engineering Manager for this project, Dave



The complex geometry of Star Trac's grommet added to the challenge of making production-quality parts with Solid Concepts' QuantumCast Cast Molding process.

Cawley, "Quickly producing hundreds of urethane castings with the quality and consistency of injection molded parts requires a level of sophistication well beyond what is usually needed for one or two urethane castings.

"Of the three components needed for the Star Trac job, the grommet was the most complex and difficult to work with," said Cawley. The grommet was an L-shaped component with a flange. Nonetheless, Cawley found that new urethane materials, special equipment, and procedures would enable Solid Concepts to meet Star Trac's requirements for performance and quality, while still getting the hundreds of Elliptical EDGE machines off the shipping floor in time.

The foot pads were the most visible components needed and aesthetics were very important. The final texture and color of each 13" x 6" footpad had to be identical so that when lined up on a fitness room floor there would be no difference between them. Repeatability and consistency of the production parts was a must.

The part quantities Star Trac needed would stretch Solid Concepts' production capabilities, but would emphasize their many years of experience working with urethanes.

Solid Concepts' QuantumCast process is a multistep process that applies vacuum, heat and pressure to process advanced formula polymers (AFP's) that result in void-free, strong and stable pre-production or early production components. This next generation polyurethane technology and Solid Concepts' ability to fabricate their master pattern directly from Star Trac's CAD drawings further assured that the grommets and foot pads had optimum mechanical properties. To meet production needs, ten master patterns needed to be produced. Custom finishing then topped off the process.

With a clear understanding of the design parameters and specific characteristics needed by the customer, Solid Concepts was able to provide interim, production quality components to address Star Trac's immediate production needs. According to Crawley, "Urethane materials have improved dramatically in the past few years. Coupled with the right procedures, we are able to produce parts that are indistinguishable from injection molded production parts in a fraction of the time it would take to produce the hard tooling needed for injection molded parts. For Star Trac, that meant they were able to complete the delivery of their new Elliptical EDGE Trainer despite the unexpected delay in producing the production tooling – making all of this more than an academic exercise."

Solid Concepts Inc.

Solid Concepts Inc. is a supplier of rapid prototyping, direct digital manufacturing, tooling and production molding services. Capabilities in PolyJet, SLA, SLS, QuantumCast™ cast urethanes, CNC and FRP prototypes and short run production parts. Tooling and Molding expertise to bring your project through to completion. ISO 9001 and AS9100 certified.