

# STRENGTH UNDER PRESSURE

## Polycarbonate Sprinkler Prototype Withstands Testing at 100 psi

*"The material for our [Fortus] system is inexpensive: we can build 60 to 70 parts with a single spool of plastic."*

– Saroj Manandhar, Toro

*Pressure-testing a working prototype at 100 psi.*

### Real Challenge

Toro's Irrigation-Products division makes commercial and consumer water sprinklers, valves, and controllers. For the golf-course market, it recently redesigned a sprinkler using FDM (Fused Deposition Modeling) technology. Prototypes for the 800S sprinkler assembly were created from polycarbonate thermoplastic using a 3D Production System from Stratasys.

The assembly had to be precisely engineered and strong enough to withstand high water pressure. Each of the dozen assembly components went through several iterations during design.

### Real Solution

"The polycarbonate allowed us to make working prototypes," says engineering manager Saroj Manandhar. "We were able to create components that could handle water pressures up to 100 psi."

"Our 3D Production System generated accurate prototypes. And it took only a few hours for a typical component." Their system enabled Toro to perfect designs for a fraction of what they might have cost. "To tool a traditional prototype and make changes to refine the design the costs would have been prohibitive for such a large scale project."

"Over a two-year period, FDM technology has reduced product-development time by 283 weeks [on a number of products], and it has reduced tooling costs and prototyping service-bureau costs by over \$500,000. Our 3D Production System has improved design quality and helped toolmakers get molds right the first time. It has even enabled us to skip prototype tooling on some projects."

"We've used FDM technology for several years because we like the ABS plastic parts, but we added a newer 3D Production System to produce stronger models using PC. The system is also faster and more accurate than our older machine. Together, the two machines dramatically improve our productivity and bottom line, and greatly reduce time to market."



*Toro polycarbonate prototype components.*



*Production 800S sprinkler.*

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