



Polycarbonate Sprinkler Prototype Withstands Testing at 100 psi

"The material for FDM is inexpensive: we can build 60 to 70 parts with a single spool of plastic."

- Saroj Manandhar, Toro

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 fused deposition modeling (FDM). Prototypes for the 800S sprinkler assembly were created from polycarbonate thermoplastic using the FDM Titan™ prototyping system.

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 FDM Titan generated accurate prototypes. And it took only a few hours for a typical component." The Titan enabled Toro to perfect designs for a fraction of what they might have cost. "To tool a traditional prototype, the price would have been astronomical to make changes and refine the design."

"Over a two-year period, FDM 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. FDM has improved design quality and helps toolmakers get molds right the first time. It has even enabled us to skip prototype tooling on some projects."

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



Image 1: Toro polycarbonate prototype components. Image 2: Pressure-testing a working prototype. Image 3: Production 800S sprinkler.

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