



## 3D SYSTEMS SUCESS STORY

### iPro™ SLA® Delivers XXL Patterns for Custom Turbines

Small to midsize hydro-electric power plants in inaccessible areas/ landscapes, such as the Southern American Andes, are the specialty of Tushino Power Machine Tools. The implementation of customized hydro-electric power plants for midsize towns yields a +20% improvement in efficiency when compared to competitive off the shelf products.

*“3D Systems iPro™ 9000 SLA® Production Center ‘prints’ QuickCast™ Patterns that reduce the time and cost of producing turbines used in customized hydro-electric power plants where Tushino Power Machine Tools deliver a +20% improvement in operating efficiency.”*

Mr. Ashrapov  
General Director  
Tushino Power Machine Tools,  
Moscow, Russia



Each turbine with its blades is individually adapted to the water pressure, drop height and flow rate of the individual power plant project. At Tushino, a team of highly educated mathematicians take each of these key values and all environmental conditions into consideration to calculate the most efficient turbine design for each specific project.

With the help of their iPro™ 9000 SLA® Center and Accura™ 60 material, Tushino Power Machine Tools is then able to turn the design into a master pattern for casting. The Francis-style Turbine in the images has 14 turbine blades, a diameter of 150 cm (39.4 inches) and a capacity of 12 Megawatts. The QuickCast™ Stereolithography master pattern, produced with Accura™ 60 SLA® Material is a pattern that weighs just 70 kg (154.3 lb), while the final cast model weighs 1990 kg (4387.2 lbs).

With traditional milling or CNC high speed machining, the production time for turbines is extensive and costly, as each single blade would have to be milled separately and mounted to the body. With the QuickCast™ build style a casting pattern is automatically produced unattended on 3D Systems' SLA® Production Center creating a hollow, honeycomb structure inside. This structure minimizes the mass to burnout during the casting process resulting in a custom turbine in a fraction of the time.



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