



Precision Manufacturing

Canyon Hydro turbines are among the most efficient and reliable in the industry. Much of this superior performance comes from Canyon's investment in advanced technology for design and manufacturing.

The process begins with CAD design and solid modeling, followed by extensive fine tuning using tools like Computational Fluid Dynamics (CFD) and Finite Element Analysis (FEA). These advanced tools make it possible to know exactly how a turbine will perform before manufacturing begins.

But a well-tuned computer model is only the beginning. Unless every complex curve is precisely replicated in steel, the turbine will not perform as well as the model. Today's sophisticated designs require new manufacturing techniques to ensure accuracy.

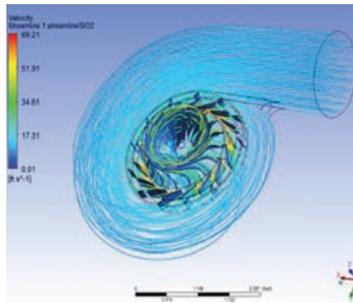
That's why Canyon Hydro has made significant investments in computer-controlled manufacturing technology. From breakthrough casting techniques to CNC machining, these advancements deliver the best possible real-world performance.



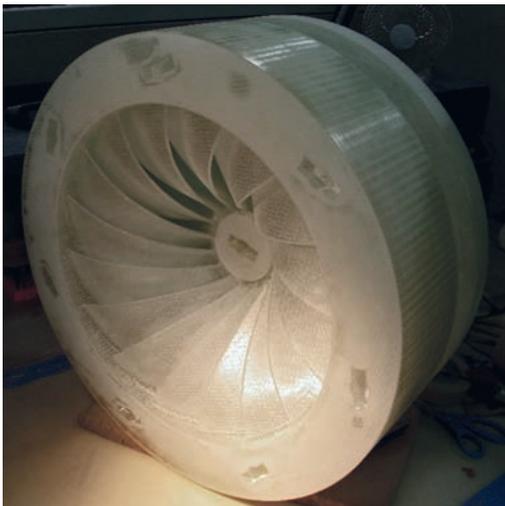
Canyon Hydro's 7-axis CNC milling machine accommodates components up to 5 meters diameter. The rotary table supports up to 15 tons. The 7MW Pelton runner shown on the machine has a diameter of 3.4 meters and weighs 21,000 pounds.

Stereolithography

For smaller runners, Canyon leverages a new technology called stereolithography to "print" a full-size polymer runner directly from the computer model. The perfectly dimensioned runner literally materializes from the bottom up as thousands of microscopic layers of polymer are printed in succession. This "perfect positive" is then used as a casting mold to create the identical runner in stainless steel.



Canyon uses computer modeling and Computational Fluid Dynamics to fine tune turbine runners for maximum efficiency. Computer-controlled manufacturing processes are then used to replicate the runner in stainless steel.



The polymer runner (left) was "printed" directly from the computer model using an advanced technology known as stereolithography. This "perfect positive" was then used to cast an exact replica in stainless steel (right).



CNC Precision Machining

Computer-controlled precision also applies to very large runners. Canyon's CNC machines are capable of maintaining absolute accuracy all the way through the manufacturing process. Configured especially for hydro components, these digitally controlled machines are able to exactly replicate every hydraulic surface defined in the original computer model.

After final machining, Canyon technicians hand-polish each stainless steel runner. It's a difference you can see in the turbine and your bottom line. The hydraulic surfaces of Canyon turbines are uniformly smooth, and every bucket or blade is identical. The result is a turbine with less turbulence, greater efficiency and longer life.



Canyon's CNC machines are equipped to address the unique requirements of hydro turbines. The special articulating arm shown above is able to reach into difficult sections to machine complex profiles.

Shown just after its final CNC machining pass, this runner will now be hand polished to achieve a perfectly smooth, accurate bucket profile.

For more information about Canyon Hydro, or for a site evaluation and quotation, please contact us:

call: 1-360-592-5552
fax: 1-360-592-2235

email: turbines@canyonhydro.com
web: www.canyonhydro.com

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Canyon Hydro
P. O. Box 36
Deming, WA 98244 USA