Pueblo Community College in Colorado Uses Rare Stereolithography Machine

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Jul. 13--Watching grass grow probably is more exciting than watching stereolithography -- the process of turning a drawing into a model.

But what the process represents and what it produces are enormously exciting.

Pueblo Community College now has a stereolithography machine up and running in the Gorsich Advanced Technology Center, and it will be used in engineering technology classes starting this fall.

The machine builds a prototype -- layer by ultra-thin layer --using resin that is hardened by lasers. It is guided by CAD (computer assisted design) specifications.

Leased for $1 a year from 3D Systems, the machine and associated software is valued at $240,000, said Jon Botsford, vice president for technology at PCC.

"There isn't another machine like this at a community college in the state, where students can get training on the machine and companies can send their employees in to get training," Botsford said.

"This is a partnering agreement. In return for use of the machine, we are preparing a CD-ROM-based training program (for 3D Systems) on how operators are to use the machine.

"We will be taking in a limited amount of work to support the machine and provide training experience for students."

Botsford said the college spent $90,000 on peripheral equipment and a service contract for the stereolithography machine.

Jerry Christie, chairman of the college's engineering technology department, estimated there are only six to eight 3D Systems stereolithography machines at work in industry in Colorado, and possibly 12 to 15 rapid-product-development machines of all kinds in the state.

"It's neat for me," Christie said. "I first saw it in 1986 at an international trade show in Chicago. I really hoped and dreamed I'd be working on one, but to me it's sort of a miracle to have it here."

He said before the technology existed, a company wanting to develop a prototype for a part would have turned to an in-house model maker or gone to a model shop. Making the prototype by hand would have taken weeks or months, while the stereolithography machine can do it in hours or in a day, depending on the complexity and the height.

The machine also can do the job for less money.

Two prototypes made in the PCC machine cost $2,400, while a model maker using conventional methods would charge between $6,000 and $8,000 for the job, Christie said.

Granted, the machine process still might seem slow and expensive, but it yields three-dimensional parts in one piece with a very high degree of accuracy.

After it leaves the machine, the prototype is cleaned and dried, removed from the platform on which it was built and then cured in an ultraviolet oven.

All types of manufacturers use stereolithography to create prototypes, Christie said.

"Estes Industries -- we do some work for them," he said, showing a small model rocket. "Toy companies use it; Mattel has a life-size model of Barbie (made using the process). Harley-Davidson prototypes all the parts for its bikes. All the big auto makers use this process."

And, at the college level, stereolithography gives the student something concrete to hold in hand after doing design work at a computer, Botsford said.

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