

Digitally manufacturing the fixture with polycarbonate took it from eight pieces to one, more accurate piece that lines up.” - Chris Howells, Engineering Manager, Wair Products

The Challenge

- Aluminum tooling needed a 3-4 week lead time
- There were too many parts associated with the original fixture
- Wasted materials

The Solution

- RedEye On Demand’s digital manufacturing services using polycarbonate material

The Result

- Cleaner design of assembly fixture
- Lighter weight
- Can easily resubmit file to RedEye for additional fixtures
- Cost savings associated with using a plastic material
- Faster, more compact device
- Realized that additive manufacturing is a sensible alternative to traditional manufacturing processes

Company Profiles

Wair Products (www.wairproducts.com) is a Bloomington, Minnesota-based company that manufactures custom valves for a variety of fluids. The company was established in 1988 as a spin-off from a mobile equipment hydraulic valve manufacturer. The first product Wair Products introduced was a sanitizing system for bulk beverage syrup tanks distributed to the fast food industry.

RedEye On Demand, a business unit of Stratasys, is the world's largest provider of rapid prototyping and direct digital manufacturing services. With more than 100 systems in its facilities, RedEye is the source for low-volume, high quality models and working parts made from one of the largest selections of thermoplastic materials available, such as ABS, polycarbonate, ISO certified and more. From digital files, RedEye quickly builds parts of any size while maintaining precise design accuracy.

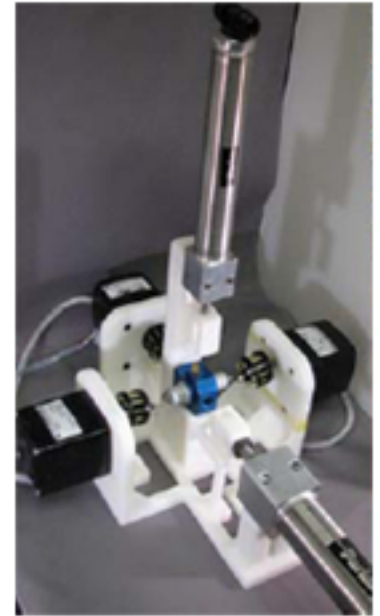


Figure 1: A test fixture that clamps to a liquid oxygen economizer valve

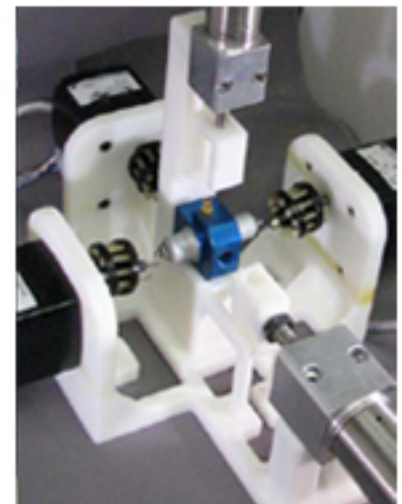


Figure 2: Test Fixture made with PC Thermoplastic

Wair Products manufactures custom valves for a variety of fluids from its Bloomington, Minnesota headquarters. The company designed a test fixture that clamps to a liquid oxygen economizer valve and automatically sets the valve pressure. Once the valve pressure is set, the fixture does a complete pressure test of the valve assembly. The valve regulates oxygen flow from portable oxygen tanks to humans.

Demand for the valve continued to increase and Wair Products quickly needed additional fixtures to test the valve before fulfilling orders. The aluminum tooling company that previously machined the fixture needed a three-to-four week lead time and its complex geometries made it extremely difficult to machine with aluminum. Because the design is so complex, aluminum tooling created eight parts that needed assembly before the fixture could actually test the valves.

In order to meet increasingly tight deadlines, Wair Products needed to find an alternate manufacturing solution. Pete Nelson, Owner of Wair Products, was aware of the technology that RedEye provides. "I saw ads for RedEye in various trade publications," said Pete. "One of our former employees works for RedEye now and we decided to see what they had to offer."

RedEye understood the time constraints that Wair Products faced, but this was the first jig and fixture order they received. "We were confident in our ability to quickly produce the part for the fixture," said Jeff Hanson, RedEye Sales Manager. "This opportunity opened a new door for us in a niche that we didn't realize could utilize our services."

RedEye took on the project to manufacture the fixture that Wair Products needed dramatically decreasing the waste expelled from the aluminum process. "There were too many parts associated with the original," said Chris Howells, Engineering Manager at Wair Products. "Digitally manufacturing the fixture with polycarbonate took it from eight pieces to one, more accurate piece that lines up." Ultimately, digital manufacturing produced a cleaner design of the assembly fixture.

"People are constantly lifting these fixtures on and off of the shelves to test valves," said Pete. "By using plastic, we significantly decreased its weight. Our employees are glad we switched to plastic too."

Although RedEye only produced one fixture for Wair Products this time, they do expect to use RedEye services as soon as orders for valves increase. "We can easily submit a file without redoing it, which saves us engineering time and in the end, money," said Chris. "Plus, we have a single source with more machines than anyone else."

Pete and Chris were pleasantly surprised by the design time saved using RedEye's services. "We are valve designers, not fixture designers, but we must design one to get the other," said Chris. "By allowing us to simplify the design process, we can get back to our core competency."

"We automated the process of testing the valve, which used to be a manual process," Pete added. "Now, we are a key player because we were able to automate the manufacturing process too."

"It was a positive experience," he noted. "It opened our eyes to using this technology for jigs and fixtures in addition to prototypes."



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