

All in a day

At Hoffman Design Works, it's all work and all play

“I love my job.” Anyone who can make that statement and truly mean it is a lucky individual. Drew Hoffman is one of those people. He’s the founder of Hoffman Design Works, Bloomington, Ind., and it’s common for him to profess the profound joy he gets from 9 to 5. It’s especially convincing when he describes some of the projects he’s accomplished since opening the custom design firm in 1999. He’s constructed installations for children’s museums and has currently been working with the Navy on radar antenna mounting systems for its new amphibious stealth ships.

“When I started Hoffman Design Works, I wanted to do creative, interesting work, so our forte seems to be custom mechanical devices,” he says. “We get into weird, crazy projects for children’s museums and science and technology centers. During my first few years in the business, almost everything that I did was museum exhibits. It’s all cool, interactive stuff for kids who want to work cranks and levers and study the aspects of physics. Those projects have been so much fun.”

One of Hoffman Design Works’ more popular exhibits is a giant flowing bub-

ble machine that’s 12 ft. tall. “The kids will turn a crank, and two vertical wires spread apart to make a large film of soap,” Hoffman explains. “There’s a secret button that they push that activates a blower that’ll blow behind the soap film. It blows a big tubular-shaped bubble out into the room. And then it’ll pop, and the kids will leap up and down and scream with excitement.”

The engineering challenges that are involved with creating the museum installations reiterate just how rewarding Hoffman’s work can be. “Kids tear stuff up,

so as a mechanical engineer, we’re trying to not only have an aesthetic piece, but one that’s mechanically sound,” he says. “I usually build these things like I build my machine tools, as robust as possible.”

Museum quality

The enthusiasm Hoffman exudes when describing his museum work is mirrored in his tone when talking about his most recent equipment purchase—a 6-ft.-by-20-ft. Omax Fabricator waterjet. It’s been in service at Hoffman Design Works for almost a year, and the face of the firm hasn’t been the same since.

“We get our hands dirty in so many different types of material,” he says. “I wanted something that could cut anything, not just metal. There are so many neat things you can do with the machine from a design perspective. A lot of our designs revolve around how we can utilize it.”

The waterjet’s Solid Edge modeling package is just one of many aspects that has made Hoffman giddy. And the sheet metal program within that package is so simple, even a child could use it—a child formally educated in mechanical engineering, of course.

“What’s neat about the Solid Edge modeling program is that you can design a complex, bent-up part, like a 3-D sheet metal box,” he says. “And when you’re done, you push a button, and it’ll flatten it out to the equivalent pattern. It even compensates for bend radii at the corners, depending on material type. And then you push another button and you have a DXF file that you can import directly into the waterjet.”

To support the functionality of the solid modeling program, Hoffman Design Works added a 12-ft., 176-ton CNC press brake. Paired with the waterjet, the company has found unlimited contract opportunities, such as making electronic enclosures with complex electrical fittings. D shapes and trapezoids are treated like kid’s play compared with the traditional way of creating parts by machining or using special dies to punch out the pieces.

Waterjet Cutting

Boys and their toys

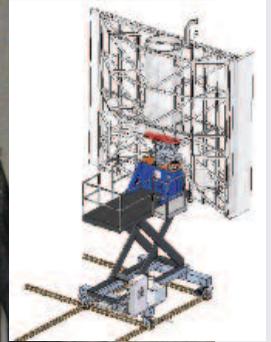
Anything involving the word stealth will get a guy's ears to perk up. And at least half of those utterances are made in context to the military. In addition to the museum work Hoffman has landed, he's also been lucky enough to work with both the Air Force and the Navy. Before founding Hoffman Design Works, he worked at McClellan Air Force base in Sacramento, Calif., on fighter jets and then moved on to Indiana to work on radar systems. He was an obvious go-to for the Navy in terms of fabricating its radar antenna mounting system. His large-bed waterjet was integral.

"The antenna's mounting surface has a large, 45-in. diameter disc on top," Hoffman explains. "And there are a bunch of threaded holes in the surface of that plate for the antenna to bolt to. In the past, that would've been done on a giant milling machine. With waterjet technology, no heat is introduced into the piece. Anytime that you cut out big discs and put heat onto the edge, the disc is going to turn into a potato chip. What's really cool is that we were cutting through 1-in.-thick steel plate. You have to get a good, quality piece of material and if you have that, you can just go gangbusters with the waterjet.

"We actually ran a couple of test cuts," he continues. "The hole pattern in that plate had to be tapped for threaded holes. We actually dialed in the waterjet so it could do the pre-drill for a tapped hole, and it was accurate enough to do that through the thick plate. Once it was cut out, all we had to do was position it over a drill press with a tapping head. We tapped the holes out, and that only took an hour. With the ability to cut thick, heavy plates with no heat-affected zone but with a really accurate edge, you're suddenly designing things in a way that you never would have in the past."

The accurate edges that he's referring to are done thanks to Omax's Tilt-A-Jet design. The Tilt-A-Jet feature positions the nozzle to allow users to achieve a near-perfect edge.

"Anytime you cut through material, there's a kerf angle, and the Tilt-A-Jet fea-



Hoffman Design Works has been contracted with the Navy to construct radar antenna mounting systems to be implemented on amphibious stealth ships.



ture tilts the jet so that the kerf angle is always on the away side of your material," says Hoffman. "That gives you the squarest edges of any machine that you can get."

The tolerances and perfection that are required by the Navy and the museums that Hoffman works with require an attention to detail that could potentially cause some fabricators quite the headache. Hoffman, however, considers it a labor of love and is happy to have the waterjet working on his team.

"Myself for sure, and I think my employees, as well, love to come to work," he explains. "There's always something cool that we're working on. Sometimes it's hard when we're putting in long hours. We might spend more than two weeks cutting



Interactive museum installations make up a bulk of the work at Hoffman Design Works.

parts to get them ready for assembly, but then, when it's all bolted together in a single day, it can be quite rewarding to see the final result." **FFJ**

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