

RIGHT THE FIRST TIME

Job shop drafts shape designs for thick plate fabrications with FastCAM's software suite

Most of us get a chance to tackle geometry formulas in school, from area and perimeter to the volumes of irregular 3-D polygons. In a shop setting, workers need a fundamental mastery of these topics to fabricate shapes that incorporate multiple parts. However, scribbling out equations is time consuming and there's a risk of shorthand error.

At one job shop, Casper, Wyo.-based Castlebrook Welding & Fabricating, 3-D modeling of thick plate fabrications is a regular task. To accurately draft odd shapes before cutting, forming and welding metal, Castlebrook uses FastShapes, developed by FastCAM Inc., Chicago. It's a suite of modeling programs that simplifies flat-pattern designs for shapes including cones or pipe branches, as well as complex components like gears. It's CAD/CAM friendly but functions well on its own.

Castlebrook works on anything from lawnmowers to big oilfield equipment for customers across Wyoming and the Dakotas, says Tony Trujillo, owner of Castlebrook Welding & Fabricating. Oil rig fabrications is where FastShapes particularly is useful.

The program comes loaded with a shape library, and each shape module takes users through material selection, thickness and desired dimensions. When enough data is entered, the program renders a 3-D preview for manipulation and shading. Some of the shapes are tanks, vessels and cones with offset or oblique apices.

"Whether it's A516-70 normalized steel or just A36, FastShapes figures out what we need for bending tonnage and things like that," Trujillo says, adding he fabricates everything from 16 gauge up to 1-inch-thick



plate. "It's really a time saver instead of doing all the old-fashioned formulas on paper."

That time savings extends to conducting bids for prospective jobs. Castlebrook can quickly mock-up a job to determine cut lengths for shapes, giving customers an accurate estimate of the fabrication cost.

"I used to have to use formulas to see what we'd need for material for a certain shape, but this lays it out in front of me in a few minutes," he says.

Simple segments

Typically with thick plate, it's necessary to consider forming and weld joint detail before cutting parts. As an early adopter of CNC cutting, as well as FastCAM's FastNest software for its plasma burning table, Castlebrook now takes the guesswork out of its manual designs.

Although Castlebrook can create cones with one sheet of plate, the company can specify how many cone segments it wants. For example, if a cone has three concentric sections, FastShapes will ask for data to ensure a correct cut path.

"The layout of the FastShapes is just phenomenal," Trujillo says. FastShapes

also shows the forming lines and bend angles in all designs—areas that can be problematic because, for instance, forming lines for an offset cone must be graduated toward the offset of the shape. Mark Fagan, research and development at FastCAM, says this is a headache the software aims to assuage by getting designs right the first time.

"Fabricators would be all too familiar with the problem of attempting to rectify a twist in heavy plates after forming," Fagan says.

For rolling, a fabricator may need to add green, or extra material allowance, to the edges of patterns to avoid flat spots at joint edges. A pattern for a square-to-round transition may need extra material at the seams so the press brake can fully form the shape, closing the weld joint (the extra material is removed after forming).

If Trujillo needs his press brake for forming instead of the plate roll, FastShapes will include etching lines in the output file. His Hypertherm plasma cutter can then make the guidelines so he knows where to form the metal.

Generally, weld joints are consistent throughout their length, but sometimes shapes have continuously varying geometry, like a pipe intersection, says Fagan.

"FastShapes compensates for all these forming and joint requirements, whereas most CAD systems do not even consider them," he says.

Beyond the benefits provided by the software, FastCAM's technical support has solved Castlebrook's problems when needed. Trujillo says shortly after buying the business about 10 years ago, Castlebrook's computer system had to be rebuilt.

"All the guys at FastCAM really helped me get going in a timely fashion," he says. "They've been really good to us over the years." ■

Castlebrook Welding & Fabricating,
Casper, Wyo., 307/234-7058.

FastCAM Inc., Chicago, 312/715-1535,
fax: 312/715-1536, www.fastcam.com.