

Mastered Models 4

Improving the geometry of a problematic ring model

BY KATE WOLF *Editor's Note:* This article is the fourth in a series on evaluating and revising CAD/CAM models for production.

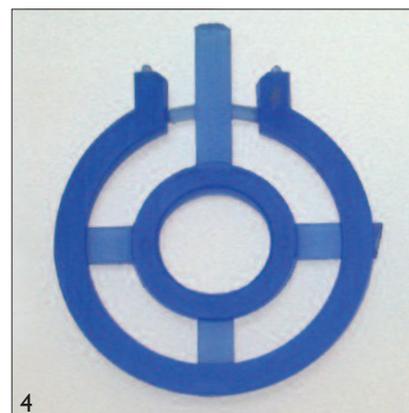
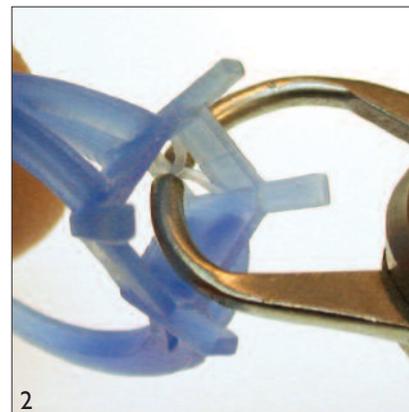
Before casting or molding a model of any type, it is extremely important to carefully inspect the pattern for defects and potential production problems. Look for pits, hairline cracks, tool marks, and vacancies (large pits). Also, check the geometry to ensure that the model is designed to encourage progressive solidification. It should be heaviest at the sprue and taper gradually, with the thinnest cross sections farthest from the sprue.

For rings, I make shanks a minimum of 1.5 mm thick and taper them to 1 mm. To get a good injection, I recommend a minimum 1 mm wall thickness. You should also avoid areas that abruptly go from thick to thin, or you risk shrink tear porosity at the thin areas and poor injections.

- To evaluate the model shown here (1), I started by using a degree gauge to measure it (2). It has a few major problems:

- The area at the bottom of the setting is 0.4 mm thick, and it's adjacent to a heavier section that is 1.6 mm thick. This abrupt transition from thick to thin could cause shrink tear porosity.

- With the bottom of the setting being so thin (and keeping in mind that it will lose 1 to 2 percent of the thickness once it is cast and polished), I'd be worried about sizing this ring up or down, as it would distort the setting and might damage the stone. Even an impact could deform the shank enough to break the stone.



- The V in the shank is heavy compared to the adjacent shank and setting.

- The bottom of the shank is 1 mm thick and 0.5 mm wide—a bit wimpy for my preference.

- There are some vacancies in the pattern that need to be filled.

If there were time, we could have adjusted the CAD file and milled a new pattern incorporating these changes; however, because this needed to be cast right away, I had to adjust the pattern by hand.

- I began by building up the inside of the setting and shaving away some of the

thickness inside the V part of the shank (3). I also prepared a heavier scrap shank that measures 1.4 mm wide by 1.5 mm thick to replace the existing shank (4).

- Using Touch Up Wax and a wax pen, I built up the inside bottom of the setting (5). Because Touch Up Wax melts at approximately 165°F, and milling and carving waxes melt at about 245°F, it's important to test the temperature of the wax pen on a piece of scrap wax to make sure that it's hot enough to melt the Touch Up Wax but not hot enough to melt the blue wax. You don't want to lose

the detail on the setting.

- I scraped the inside of the shank with the corner of a carving knife to smooth out the tool marks and blend in the Touch Up Wax (6).

- The wax in the V part of the shank was too heavy at 1.6 mm, so I needed to shave away the inside edge to make it 1 mm thick to reduce the possibility of shrink tear porosity. I used the taper triangle tool to open up the window (7).

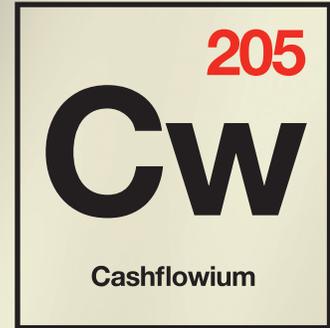
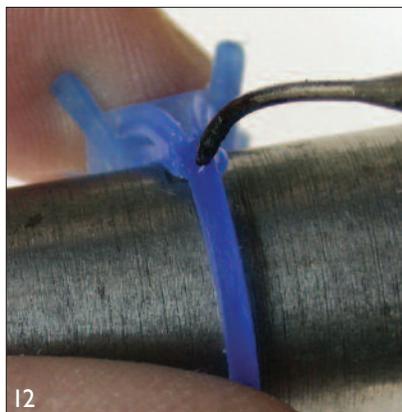
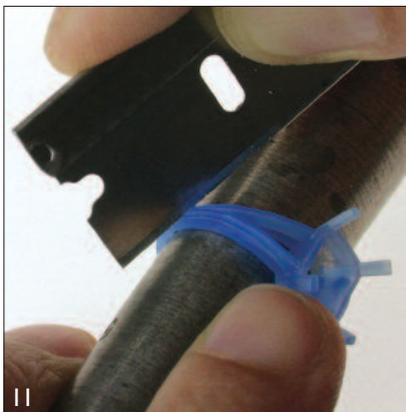
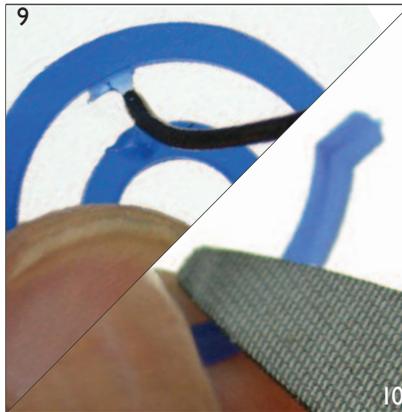
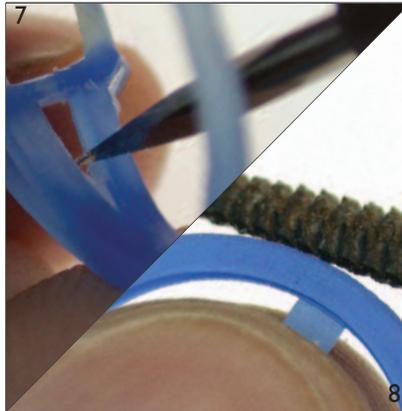
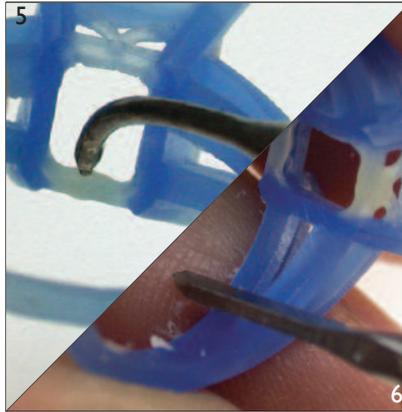
- To prepare the new shank, I left the support in the shank while filing the outside (8).

- Using a hot wax pen, I melted away the support from the inside of the new shank (9).

- I used a 00 half-round file to remove the remaining melted lumps of wax (10).

- After positioning the ring on a mandrel, I pressed through the wax to the mandrel with a single-sided razor blade on both sides to remove the old shank (11). I then trimmed the new shank to fit.

- I positioned the ring and the new shank on the mandrel at the proper size, poking through the seam with a hot wax pen to tack the ring together (12).

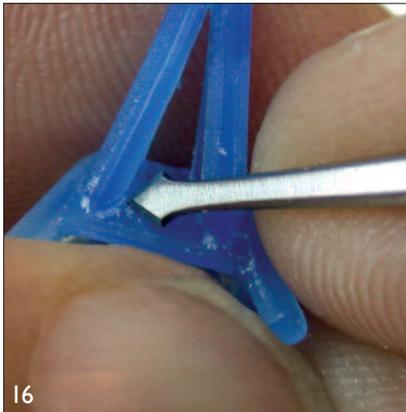
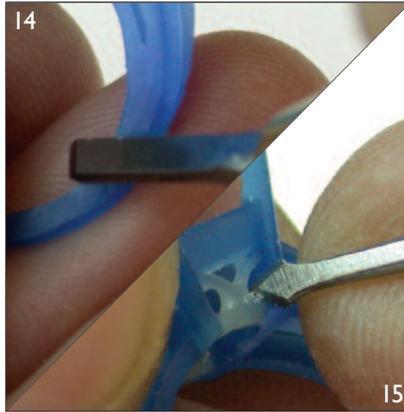
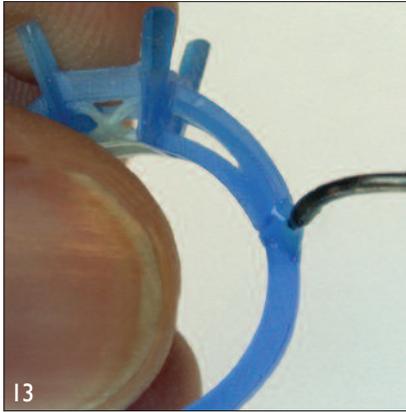


Looking to increase your cash flow? David H. Fell & Company can turn your gold, silver, platinum and palladium into green. We offer a fast, honest return on your precious metal refining as well as a variety of settlement options. Which might explain why the world's finest jewelers have trusted us with their refining for nearly 40 years. Call 800-822-1996 or visit dhfco.com to learn more.

David H. Fell & Company
Outstanding in every element.



Visit us at JCK in Las Vegas booth 61500.



- I removed the ring from the mandrel and filled it in with more wax (13).
- Using a 00 file and the corner of a carving knife (14), I blended in the shank.
- Last, I used a diamond point tool to finesse the detail on the side of the under-bezel (15) and around the V shank (16).
- The ring is now ready for casting (17). ♦

Kate Wolf describes herself as a jeweler, educator (katewolfdesigns.com), tool queen (wolftools.com), and the Wicked Wench of Wax (wolfwax.com). She would like to thank Vasken Tanielian of CAD WORX (3dcadworx.net) for supplying this month's CAD/CAM samples, and she's looking for more wax models with "issues" to use in the "Mastered Models" series. If you would like to submit samples for future articles, e-mail k@wolftools.com.

COMPLETE SOFTWARE SOLUTION FOR JEWELRY DESIGN & MANUFACTURE

See JewelSmith in action at JCK Booth #60609

www.artcamjewelsmith.com
1-877-DELCAM-1

Delcam
ArtCAM
JewelSmith

Orion Welders

The Orion Master Jeweler Plus
Pulse-Arc & Resistance Welder

Powerful. Versatile. Affordable.

Perfect for Custom Manufacturing

Visit us Online and View our Short Video Demos

Made in USA 1.877.786.WELD
www.OrionJewelryWelders.com