A Web-Based Tool for Box Ring Design and Layout

**My First Box Ring**

Introduction

I started working on this tool after working on Alan Revere's box ring project in his book, <u>Professional Jewelry Making</u> (October 1, 2011, Brynmorgen Press). I'd already modified his template shape to make it more efficient, and had been creating ring templates by calculating sizes, and manually adjusting my basic drawing.

My goal was two-fold, to create a simple tool to quickly and easily create box ring templates in various sizes, and to understand box ring geometry in greater depth. That original goal grew to include additional style modifications such as changing the crown height, and shifting the ring face along both the X and Y axes relative to the center of the shank, creating asymmetric shapes.

I chose HTML as my development/publishing medium so that I could readily share this with others in the jewelry making community that want to experiment with this model.

About Box Rings

Let's start with some basic concepts about box rings. A box ring has essentially four components, an inner shank, an outer shank, and two ends. The inner shank is a closed circle. The outer shank is (generally) open in a U-shape. The shanks are attached to each other for some portion of their lengths, starting at the base of the shank. The two ends are attached to the edges of the shanks.
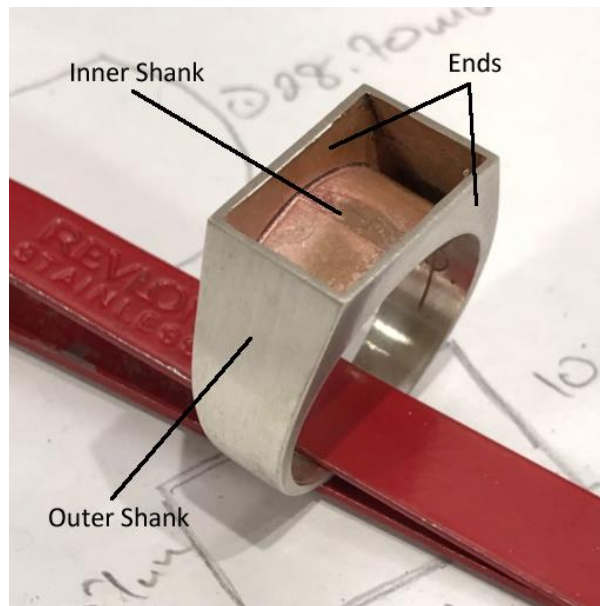
A Basic Box Ring

When assembled, this leaves a rectangular opening on the top of the ring where the face will be attached. The ring is therefore hollow. Looking at the side of the ring, it usually has a trapezoidal shape.

The style of the ring can be varied by changing the width of the face, the height of the face, and how the face is centered relative to the shank.
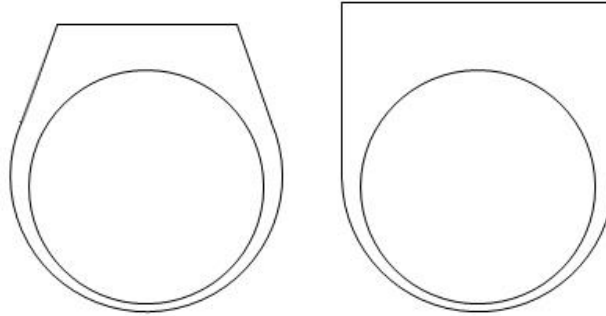
Two Different Shoulder Angles, Two Different Crown Heights

Other modifications are also possible. The surface of the face doesn't necessarily need to be perpendicular to the shank, it can be "tilted." It's also possible to create a box "like" ring without what we might consider a face at all, using two different size shanks with a gap at the top. These latter styles are outside the scope of the current version of software (but not future versions).

How to Use the Tool
In addition to creating templates for specific ring sizes, the tool aids in design by helping you visualize how the final ring will look. It's not as fancy as a CAD program in that it won't give you a rotatable 3-D view, but it will give you a pretty good idea of the final ring shape.
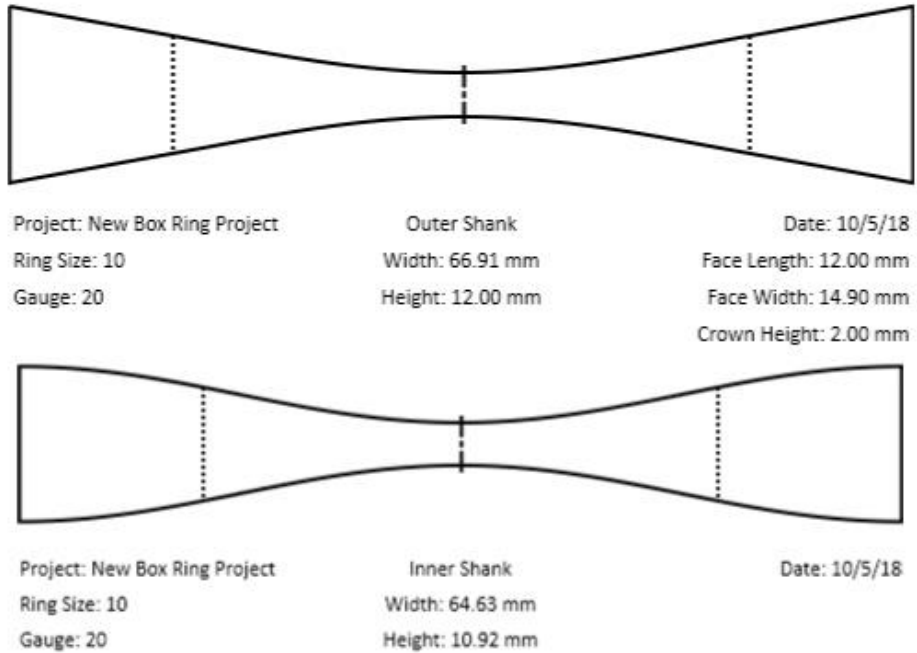You have three panels to work from:

- The Size & Style Parameters panel on the left where you will specify your parameters,
- The Design panel in the center that will show you a large rendering of the outer and inner shank templates as well as size information, and
- The Renderings panel on the right that shows various views of the ring, and gives you downloadable template images.

Start by entering your basic requirements, the ring size and the thickness of your stock. Add design features like the shank size and height of the face. Click the REFRESH button to update the profile views.

Modify the layout using the Left and Right Shoulder inputs to shift the face along the axis of the shank, and change its width. Changing the Face Offset input will shift the face perpendicular to the axis of the shank.

Once you've completed your design, click the DRAW TEMPLATES button. This will create downloadable images under the Templates tab. Right-click (click-and-hold on a Mac) on these images and save them to your computer.

Project: New Box Ring Project   Outer Shank   Date: 10/5/18

Ring Size: 10   Width: 66.91 mm   Face Length: 12.00 mm

Gauge: 20   Height: 12.00 mm   Face Width: 14.90 mm

Crown Height: 2.00 mm

Project: New Box Ring Project   Inner Shank   Date: 10/5/18

Ring Size: 10   Width: 64.63 mm

Gauge: 20   Height: 10.92 mm

Outer & Inner Shank Templates

Insert the image templates into an application (I like Microsoft® Powerpoint for this) that will allow you to scale them to actual size. Use the horizontal measurement that's indicated on the template as your basis for scaling, maintaining the aspect ratio of the image.

Print the scaled image templates, affix them to your stock, and then cut your ring shanks.

You'll notice some lines on the templates. The dashed lines on the shanks indicate the start of the ring shoulders. As you bend the *outer* shank, on your ring bender or other forming tool, don't bend past these marks; the stock from each mark to the end of the shank should be flat.

There are also centerlines on both the outer and inner shanks. These aid in centering the two shanks when you join them. I suggest scribing a light line on your shanks at these marks.

Inputs in Detail

The following is a description of the Size & Style Parameter inputs:

- **Project Name**: Whatever you want to name your project for reference later, e.g. Sue's Signet Ring. This will be included in the template image.
- **Ring Size**: The (US) ring size (with a metric conversion displayed). The size range is 0 to 16 by quarter sizes.
- **Stock Gauge**: The B&S gauge number of your stock, from 12 to 24.
- **Face Length**: This is the vertical, i.e. perpendicular to the shank when viewed from the top, measurement in mm of the ring face. The face length must be greater than or equal to the size of the shank base.

- **Face Offset**: The amount to shift the entire face along its height, again, perpendicular to the shank. The range is from -100 to 100 percent.
- **Crown Height**: Looking at the ring from either end, this is the height above the top of the inner shank that the outer shank ends terminate. The range is 0 to 12 mm. If the tilt value (see below) is not zero, this is the smaller height.
- **Left/Right Shoulder**: This is the angle in degrees from the horizontal centerline of the shank of to the point at which the outer shank diverges from the inner shank. The range is -15 to 90 degrees. Negative values indicate a point below the centerline.
- **Lock**: When checked, this will force the Left and Right shoulders to be the same, i.e. a symmetrical end view of the ring. Uncheck to allow these to be changed independently of each other.
- **Shank Base**: The width of the bottom of the shank, from 1 to 14 mm. This must be less than or equal to the face height.
- **Face Tilt**: This value tilts the face of the ring forward or backward. The allowable range is -45 to 45 degrees. This input is still experimental, and may not perform entirely as expected, especially for extreme values. Note: the degree of tilt refers to the angle formed when the shoulders are set to 0 degrees. As the shoulder value increases, the apparent degree of tilt will decrease.
- **Place Shank Joint at Base**: Checking this places the inner shank's solder joint at its base.

If you enter a value outside an input's limits, it will automatically reset to its prior value, and its border will turn red until the REFRESH button is clicked or the web page is reloaded.

It's worthwhile noting that while the tool sets limits on various input values, some of these, particularly extreme values, may be impractical. In addition, there error checking is not yet comprehensive in the current version (v 1.6) of the software; it is possible to design a ring that can't be created in the real world, e.g. an outer shank with ends that pass through each other. Such design errors will be visually evident.

Copy to Clipboard
This button creates a convenient URL from the current layout, and copies it to your clipboard. Use this feature to save a design, and restore it by pasting the saved URL into the location box of your browser.

Reset to Default Design
Clicking this button resets all panels to the default configuration.