Marking inside a ring using a rotary unit

SpeedMark Tutorial

1. Overview

This tutorial will show how to:

- Set up the rotary
- Mark on the inside of a ring

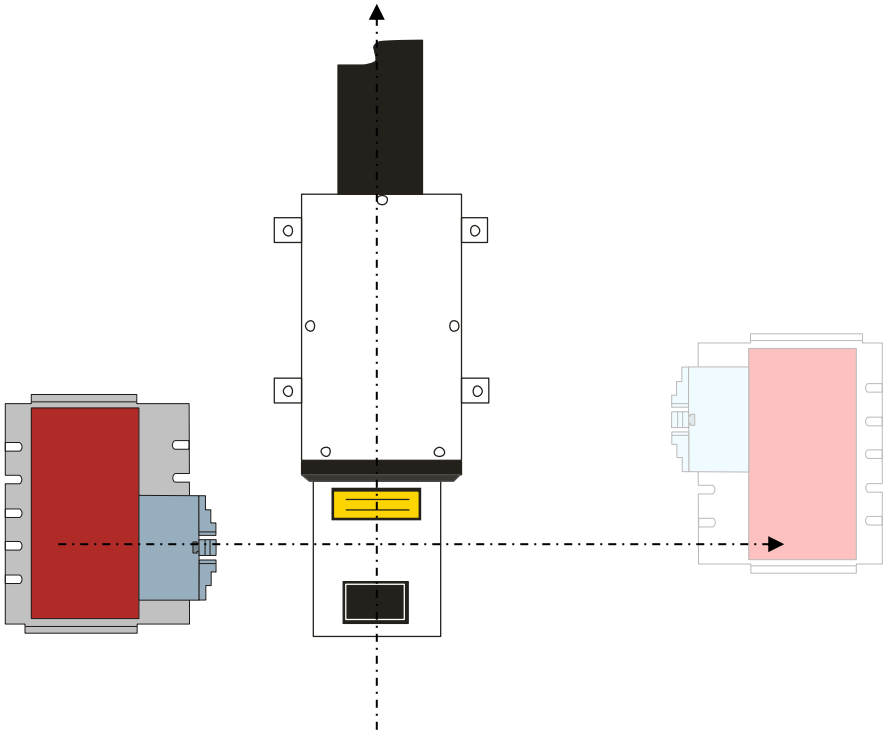
The following setup was used for this tutorial:

- SpeedMarker FL 20 W | F160 lens
- Rotary unit
- SpeedMark 3.3 or higher
- Metal ring

2. Rotary Setup

To use the rotary, it needs to be positioned with its axis aligned along one of the principal axes of the galvo scanner. While the rotary is active it will take over one of the directions of movement by rotating the part. The galvo scanner is reduced to movement along the remaining axis.

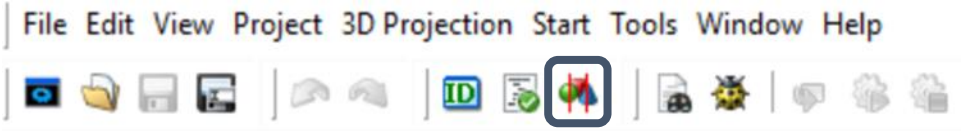
(Wait until point 5 of this tutorial before actually adjusting the rotary)



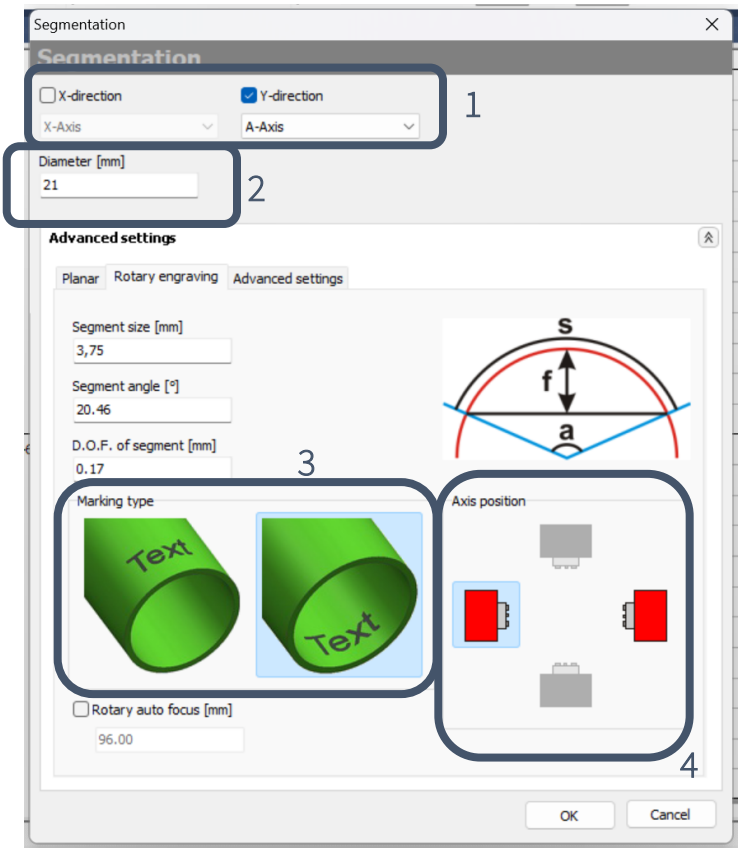
3. Setting up the rotary marking in the SpeedMark software

For this tutorial it is assumed that a rotary axis is set up in the system configuration of SpeedMark. If this is not the case please contact our team for support.

To set up the marking with a rotary in SpeedMark software, open the segmentation window by using the icon.



1. Check how the rotary is placed and in what plane it moves (x or y).
   Select the rotational axis assigned to the rotary (usually 'A-Axis')
2. Enter the diameter of the part
   The size of the marking field results from the diameter input.
3. Select whether to mark the outer surface or the inner surface
4. Select the position of the rotary relative to the marking area of the galvo scanner



Once the segmentation has been activated and a rotational axis is selected, the marking area will ap-pear as the uncoiled surface of the cylindrical part as shown below.

In this case, the rotary indexer was positioned along the X-axis of the scanner. So in the pre-view, the X-axis corresponds the X-axis of the galvo scanner with its range defined by the size of the marking area (here 120mm for the F160 lens). The Y-axis in the pre-view window now corresponds to the circumference of the part, calculated from the diameter entered above. So changing the diameter of the part will – in this case- change the height of the pre-view window.

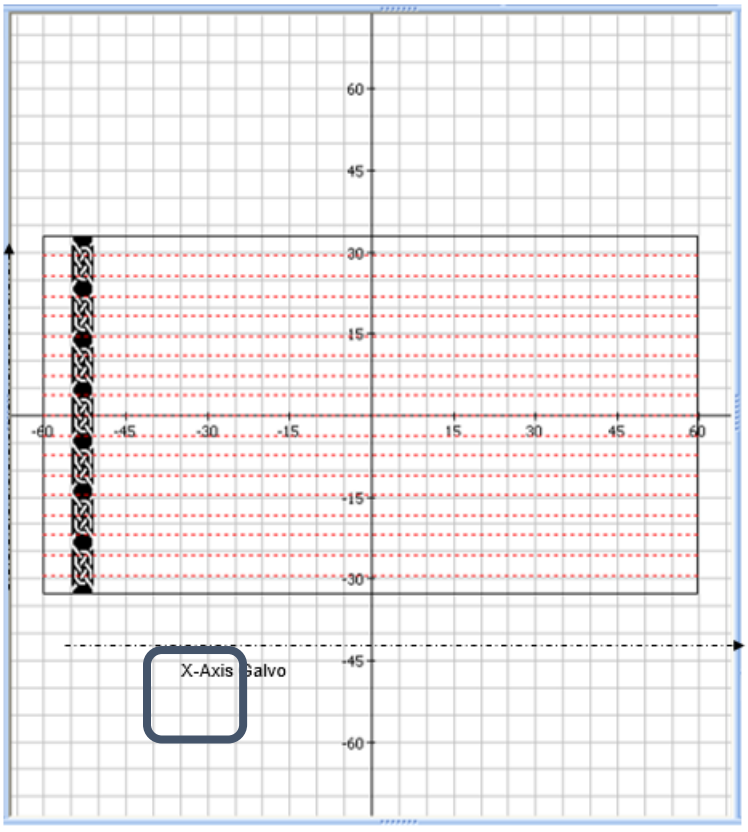
The dotted red lines indicate the segment width as entered under 'Segmentation angle'. By default they cover 20° per segment. Segments are relevant only when vector graphics are marked. Movement along the circumference is then split between the scanner and the rotary in such a way that the galvo scanner will mark everything within on segment before the rotary rotates the part to the next segment. While this allows for very fast marking, it also requires a very precise mechanical setup of the rotary, or the segment boundaries will show on the part.

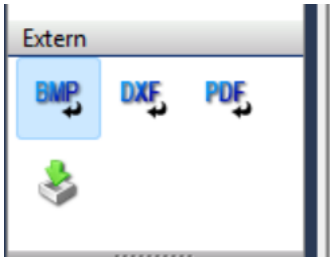
You can adapt the segment size manually e.g. to consider the size of the biggest letter or single graphical element as one segment. Doing so changes also the segmentation angle and Depth of focus (D.O.F.) of segment.

When a bitmap is marked, the laser will mark single lines, and the rotary advances the part in-between the lines. Here the mechanical setup is less critical.

4. Importing a bitmap

Click the "BMP" element in the graphic tool box and insert the BMP you want to mark.





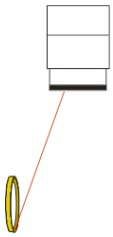
Note: Vector graphics (DXF) can be imported as well. As mentioned above working with vector graphics requires a more precise mechanical setup of the rotary and setting of the segments, or the segment boundaries will show on the part but can result in fast markings.

5. Positioning the part

The easiest way to mark the inside of a ring is to make use of the fact that towards the outside of the marking area the beam is no longer vertical. This way the inner surface of a ring can be marked without the need to tilt the rotary upwards.

Simply position the job towards the outer border of the marking area as shown above. (Keep in mind, that two borders just indicate the 0/360° line of rotation.)

This may require you to adjust the position of the rotary as well. With the rotary in a horizontal orientation, focusing is much easier than if it is tilted under an angle.

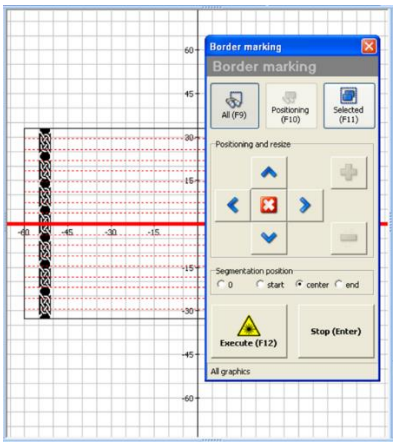


The easiest way to focus the laser is to either use a ruler and measure the distance from the bottom of the scan head to the ring or to hold a flat sheet of material as horizontal as possible next to the ring and use the focus finder to focus on that sheet.

6. Using border marking

In connection with the rotary unit, activation of the border marking (F9 or F11) will perform the following:

- The rotary will rotate to the angle indicated by a thick red line in the pre-view window. (see below) . By default this will be the middle if the graphic but different positions of the indicated line can be selected.



- The pilot laser will draw a red line who's position corresponds to the position shown in the pre-view window. The length of the line gives the height of the graphic.
- Using the arrow keys, the position of the graphic will either be moved along the galvo axis (left-right in this case) or they will be moved along the rotary axis. This will turn the rotary axis.
- Note that the +/- feature to resize the graphic as well as positioning graphics are not available in com-bination with the rotary segmentation.

7. Marking parameters

To engrave a ring, use the standard engraving parameters specific to the material used: They can be selected from the material database, or you use your own predefined parameters.

In the scope of the tutorial the following parameters were used to engrave a metal ring:

Power 100% | Frequency: 20kHz | Speed: 300mm/s (12.2inches/sec)

If the process is too slow, the number of lines marked in between movements of the rotary may be increased by going to tab called "Advanced setting" in the segmentation window.