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# Inserting Raster® Braille Beads Into Aluminum

T. 602.439.0600 • F. 602.439.0500 • sales@visionengravers.com • visionengravers.com

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Fax: (602) 439-0500
www.visionengravers.com

# ADA Braille in Aluminum

**Overview** – This tutorial will demonstrate drilling holes for ADA braille in aluminum, inserting braille beads, and cutting raised text using applique. The adhesive assist method may be used to adhere braille beads into a wide range of materials. We will take a closer look at the steps involved in building an ADA sign in an aluminum substrate.

When making ADA signs in plastic, a press fit is used to secure the beads in place. The hole is drilled to be slightly smaller than the braille bead and the bead is pressed into the hole. Harder materials will not allow for this same press fit and we must use a different method to secure the braille beads. A hole the same size of the bead is drilled and double sided adhesive tape is used to secure the beads to the substrate.

**Materials Needed** –

- ACCENT SIGNAGE 1/2" X 18YD PURE ADHESIVE TAPE
- ACCENT SIGNAGE 1-1/4" X 100YD LOW TACK TAPE
- ACCENT SIGNAGE RASTER SPHERES
- VISION Bracket for Raster® BRAILLE INSERTION TOOL
- ACCENT SIGNAGE Raster® Pen and License
- ACCENT SIGNAGE B50 Carbide Drill Bit
- ACCENT SIGNAGE 1/4" x 6.5" Collet Drill Assembly
- Applique material
- Scissors
- Brush
- Cutter Wrench
- Plastic Nose Cone
- Metal Nose Cone
- Allen Wrench (To adjust drill tool)
- ADA Profile Cutter
- Weeding Tool

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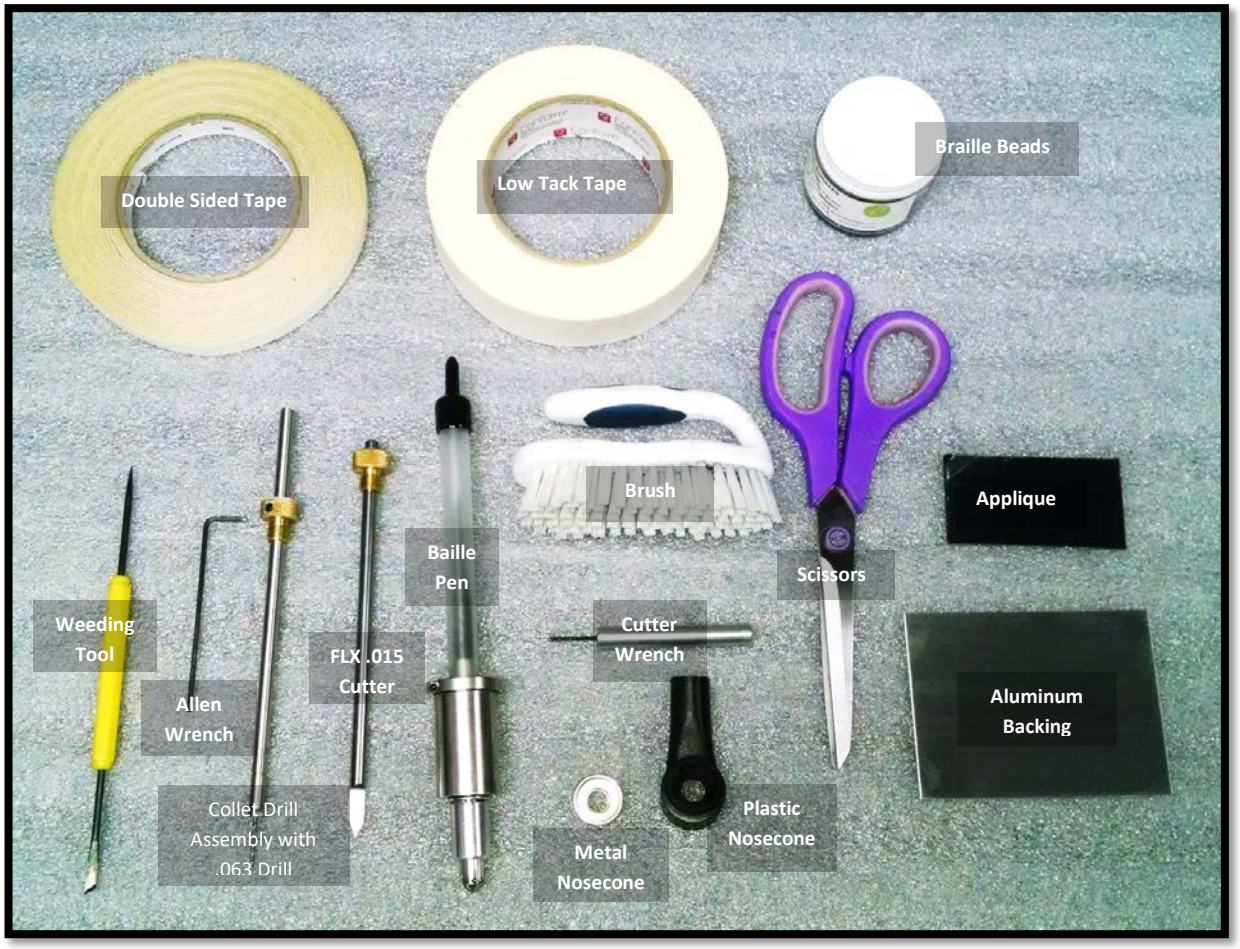


**Figure 1: Tools needed for ADA in Aluminum**

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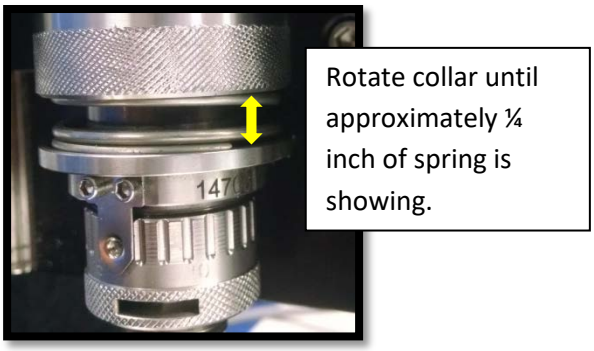
**Machine Set Up –** This section shows how to set up a 1612 Vision Machine for ADA braille in an aluminum substrate.

1. Set the spring pressure. Rotate the collar until you can see about ¼ inch of spring.




2. Install the Metal Nose Cone and adjust the micrometer to Zero.
3. Install the .063 Drill. Use the Allen wrench to adjust the drill so the drill end is not going past the nosecone.

**Figure 2: Adjust brass piece so drill will not extend past nose cone when inserted into spindle.**

4. Place aluminum on the multi mat. Place a piece of low tack tape onto the braille text area. The Rulers in the software and the edge guides on the machine can be used to help estimate braille text location.
    - **Tip** *While placing material keep in mind the braille pen cannot reach the 0 point due to its offset. Move material to ensure braille pen can reach the braille text location. Each machine may have a different offset in either X or Y direction. See Figure 2 below.*

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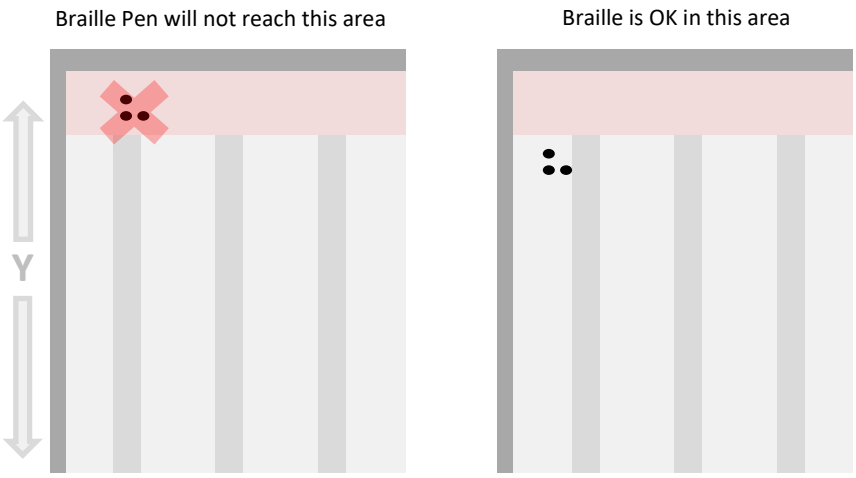


**Figure 3: Proper Braille Text Location (Top View of 1612 Pro Engraver Table is illustrated)**

5. Use the arrow buttons on the pendant to jog over to the piece of aluminum. Use the Z arrow on the pendant to jog down until the nose cone is close to touching the aluminum. Change jog speed to slow and continue jogging down until the spring compresses slightly.
6. Loosen the Allen set screw on the drill. Slowly slide the drill bit down until it is touching the aluminum. Tighten set screw. The drill has now been "zeroed" and is flush with the nose cone.
    - **Tip** - *Be careful not to scratch or nick your material while zeroing the cutter.*
7. Press the Go to Home button on the pendant. The spindle will go to its home location.
8. Rotate the micrometer counter clockwise (tightening the micrometer) to .051 inches. To reach .051 inches turn the micrometer 2 full rotations, then 1 more click. The micrometer should read 1. The tool is now set to the proper depth to comply with ADA regulations.

**Figure 4: Micrometer after drill has been set to proper depth.**

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9. Set Surface for braille pen - Jog to the piece of aluminum. Loosen the locking knob and insert the braille pen into the ADA bracket. Leave the locking knob loose. Jog over material. Jog down in the z direction until the pen tip just touches the surface. Change the jog speed to slow and continue going down until the alignment pin is just below the hole.

**Figure 5: proper alignment pin depth while setting surface.**

10. Press set surface. At the set surface menu, press enter. The spindle will lift slightly. Raise the braille pen above the nose cone and lock it. Press the Go to Home button.

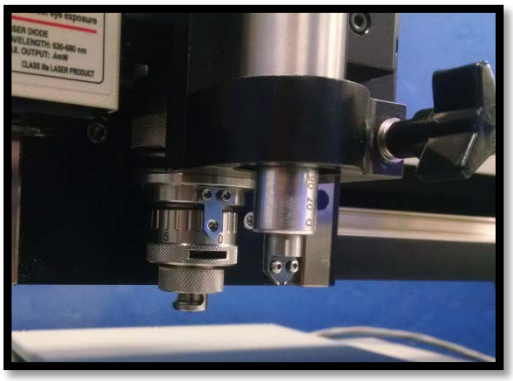

**Figure 6: Verify Braille Pen is clearing nose cone.**

**Set Up Software –** This tutorial assumes the operator is already familiar with designing ADA signs.

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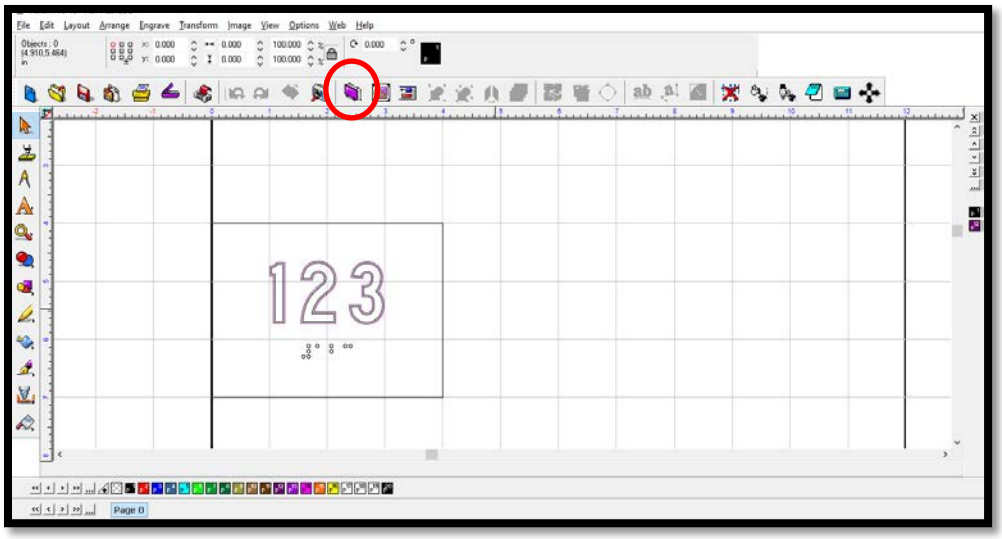
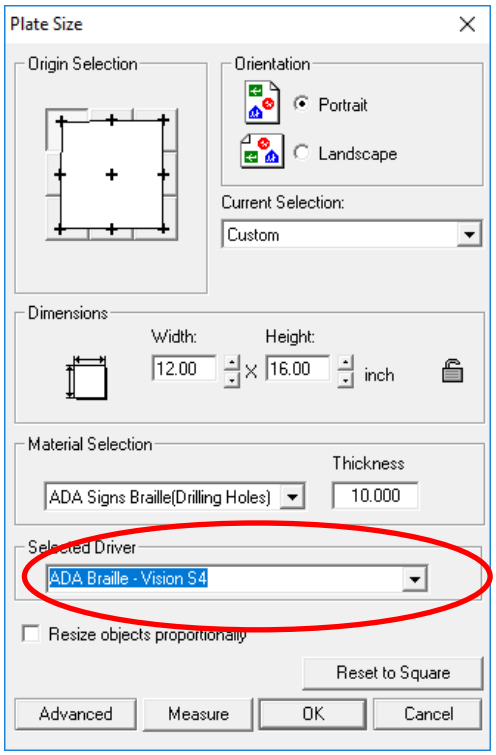
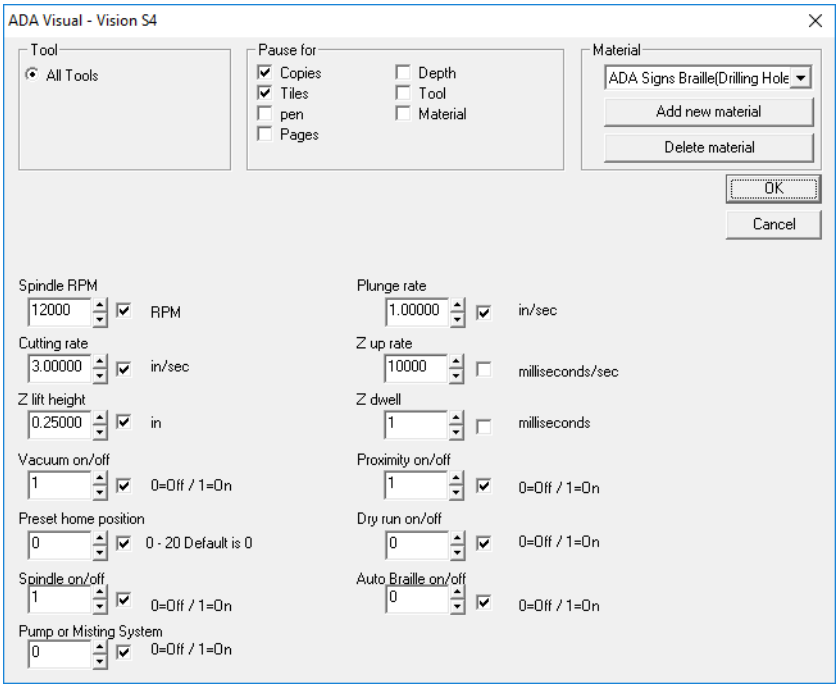
1. A simple room number sign has been made and is shown in the figure below. Press the plate size Icon on the top toolbar.



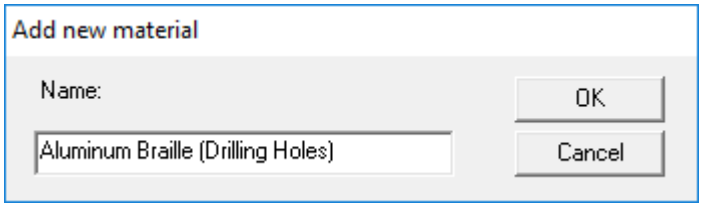

2. Select the correct driver for the machine being used.



3. Press OK
4. Create a material profile for drilling ADA braille holes in aluminum. Click engrave > Tool Options.




5. In the material section select ADA Signs Braille (Drilling Holes). Click Add new material.
6. Enter the name “Aluminum Braille (Drilling Holes)” and click OK.




7. Increase the Z dwell to 2500 and check the check box next to it. Click OK.

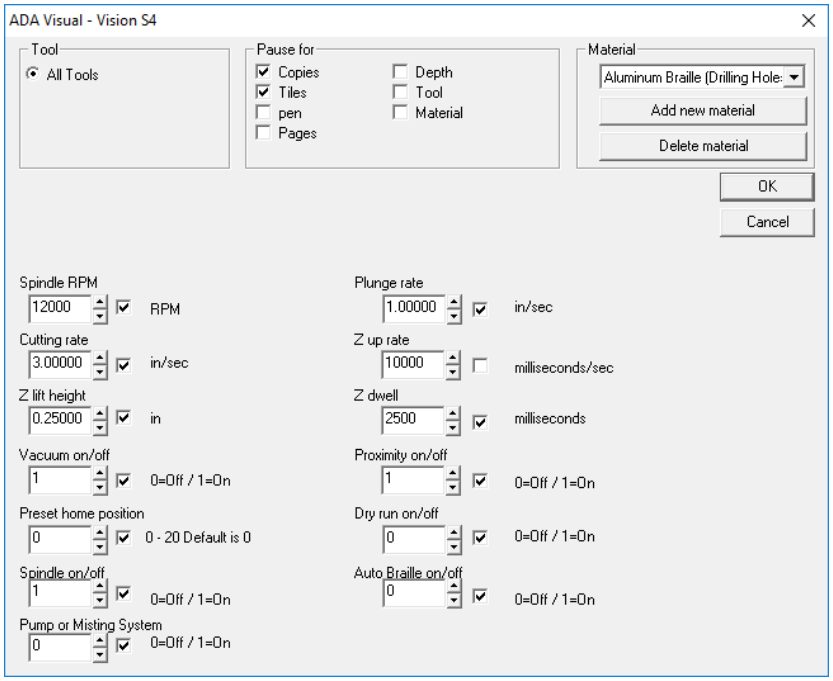



**Figure 7: Tool Settings**

**Job Execution –** These steps will cover sending the job to the 1612 and executing the job

1. Left click on the braille text in the software to highlight it.
2. Go to Engrave > ADA Plot > Cut Braille Text at the file menu. Press the Engrave Icon to send the job to the machine. Press start on the pendant. Verify the spindle is rotating.
3. Keep the area clear of aluminum debris. An air gun can be used to blow the chips away from the drilling area to help ensure the drill is going to the proper depth on each hole.
4. After the machine is done drilling, it will stop and wait for the operator to apply the double sided tape. First blow all debris out and away from the area. Apply the tape to the area and peel off the backing.
5. Lower the braille inserter and lock it. Press the start button on the pendant. The machine will now automatically insert each bead. After it is done it will wait and give the operator time to raise the braille pen. The start button can then be pressed and the spindle will go to the home location.
6. Peel the tape from the aluminum.

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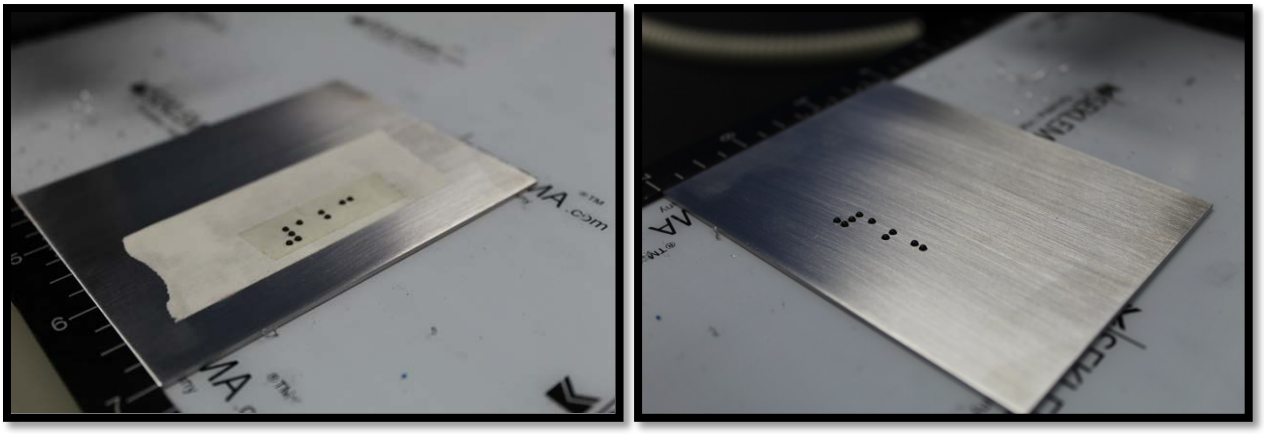

**Figure 8: Braille Text in Aluminum**

**Cut Applique Numbers**

1. Remove the Drill and the metal nose cone from the machine
2. Install the High flow plastic nose cone.
3. Adjust the FLX .015 Cutter so the cutting point does not protrude past the nose cone.
4. Install the FLX .015 Cutter.
5. Place a piece of applique over the area where the raised elements are going to be.
6. Use the pendant to jog over to the applique material. Z down until the edge of the nose cone touches the applique material. Set the cutter depth by loosening the set screw and allowing the tip of the tool to touch the surface of the aluminum. See figure below.

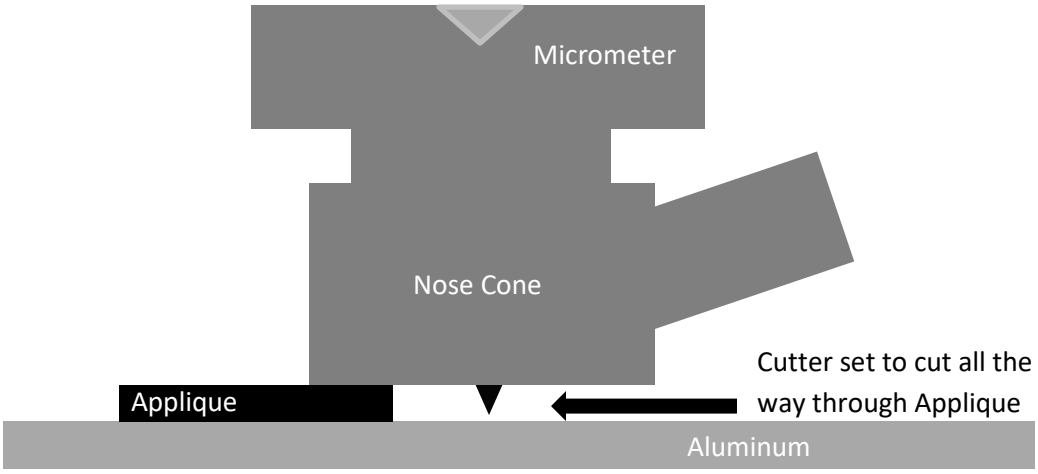


**Figure 9: Illustration of setting .015 FLX Cutter to cut applique. (Side View)**

7. Press the Go to Home Button
8. Peel off the protective cover from the applique.

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9. Hook up the vacuum nose to the nose cone.
10. Left click on the male tool path for the raised numbers that will be cut out of the applique.
11. Press the “engrave” from the drop down menu at the top of the file menu. Select ADA Plot from the drop down menu.
12. Click on the Cut Raised Elements and then hit the engrave icon.
13. Press the start button on the pendant. The job will start and the machine will now cut the raised elements.
14. Brush the area clean and inspect the cut. Ensure the cut has gone all the way through the material and the cutter depth is correct. At this time, adjust the cutter by turning the micrometer and run the job again if needed.
15. When correct depth has been reached, brush the area again and weed the applique.
16. Clean the excess adhesive from around the raised elements. A toothpick and soapy water can be used to help clean the area around the applique.


**Figure 10: Completed ADA Sign in Aluminum**

**Congratulations, you have just made your first metal ADA sign!**