Americans with Disabilities Act

In 1992, the Americans with Disabilities Act (ADA) was initiated. Since then, the Department of Justice has updated the ADA regulations (title III) that are now in effect as of March 15, 2011. The ADA requires all public places (except government buildings and churches) to install ADA compliant signage that includes tactile lettering, Grade II Braille, and in some cases, pictograms. For a better understanding, see the portion of the ADA regulation pertaining to signage. You can view these pages by visiting: http://www.usdoj.gov/crt/ada/reg3a.html#Anchor-10133. Although the entire document is very long, our interest is limited to the pages dealing with interior wall signage, Section 4.30. This document comes from the official government website for ADA compliance at http://www.ada.gov/reg3a.html. This site contains information about ADA compliance for your business, as well as information that will help you better educate clients when selling ADA signage. You can also call the government's own ADA help desk with specific questions at 1-800-514-0301.

> **(16) Building Signage:**
> (a) Signs that designate permanent rooms and spaces shall comply….
> (b) Other signs that provide direction to or information about functional spaces of the building shall comply….
> **EXCEPTION:** Building directories, menus, and all other signs that are temporary are NOT required to comply.

These regulations may seem intimidating, but don't be discouraged about making ADA signs. Like many government regulations, these are more intimidating than difficult.

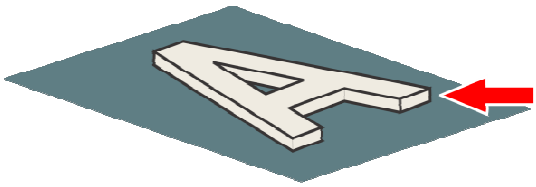
Requirements to be ADA Compliant

- The required elements of the sign must be made of "eggshell, matte or other non-glare" materials. This does not mean there can't be reflective materials used in the design of the sign. However, the ADA portion of the sign must be made of a non-reflective material. A glossimeter should be used to determine the reflectivity of the material. Since few sign makers will have such a device, consult Rowmark's product lineup for ADA compliant materials. Substituting other materials that look the same to the naked eye may or may not meet these requirements, so follow Rowmark's recommendations carefully.
- Dark letters on a light background or light letters on a dark background must be used, with the background having a non-glare finish. There is no suggested contrast ratio in the ADA regulations. This is not a feature for the totally blind, but for assisting the visually impaired to see and read the letters more easily. For correct color contrast information, please see Rowmark's color contrast chart for suggestions. In short, the more contrast, the better. As stated before, substituting materials that look the same to the naked eye may or may not meet these requirements, so follow Rowmark's recommendations carefully.
- The thickness of the tactile lettering must be a minimum of 1/32" (0.8 mm). The letters need to be all uppercase. The smallest the letters can go is 5/8" tall. The largest letters can go no more than 2" tall. Any other letter or character size outside of these parameters is not compliant. Hanging signs and/or projecting signs follow a different set of regulations.

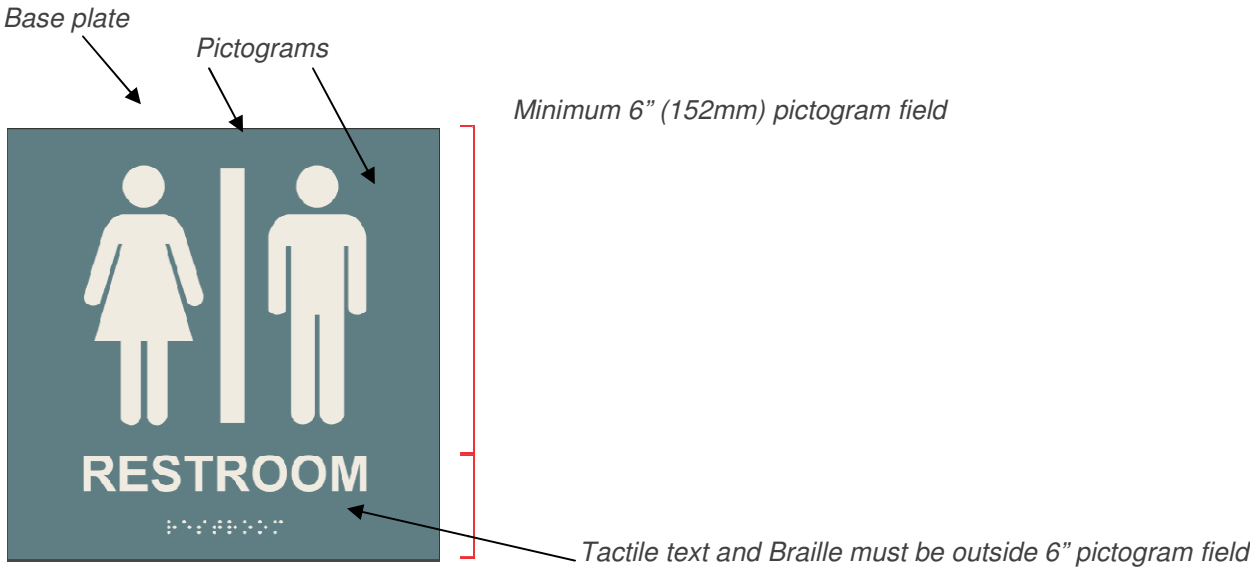
- Tactile type faces and fonts for words and numerals shall be raised 1/32”, uppercase font, and sans serif type only. No italics, scripts, or fancy type fonts can be used. Remember that the type is meant for the blind and visually impaired to use easily. Pictograms should accompany the verbal description of the sign. The border dimension of the pictogram shall be 6in minimum in height. The verbal description should be placed directly below the pictogram. The type should also be accompanied with Grade II Braille.
- In addition to size and style, the dimensions of the characters are also important. The width-to-height ratio of the letter must be 3:5 and 1:1 and the stroke width-to-height of the letter must be 1:1.5 to 1:10. These dimensions can easily be measured with a micrometer, however, fonts like Helvetica Medium and Futura Regular are generally accepted as meeting these requirements.

Elements involved in ADA sign fabrication

- **Base Plate:** The platform everything else is attached to.
- **Tactile Lettering:** Letters that are raised 1/32” above the background of the sign. Rowmark ADA Alternative® is made in 1/32” specifically for this purpose and is available with and without adhesive.
- **Braille:** There are three types of Braille. ADA requires grade II Braille. This is a Braille that allows for contractions that greatly reduce the number of characters used. It is not a direct translation of letters (Grade I). Most engraving software offers a translation program for this purpose.
- **Pictogram:** A pictogram is an International symbol made in the same fashion as tactile lettering. Although pictograms are usually made with the same 1/32” gauge material as the tactile lettering, it is not required to be tactile. It is required to fit in a field that is a minimum of 6” in height. These are not required on all signs. Office signs, room numbers, etc. would not require pictograms. Restroom signs, phone signs, no smoking signs, etc. do.



1/32” (0.8mm) min. above base plate



Additional Information for ADA Compliance

Color Contrast

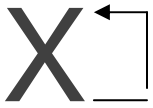
Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background. The background of the sign shall also have a non-glare finish.

Light colors on dark background

Dark colors on dark background

Tactile Characters

Character Height



Character height measured vertically from the baseline of the character shall be 5/8" (16 mm) minimum and 2" (51 mm) maximum based on the height of the uppercase letter "I".

Character Proportions

Characters shall be selected from fonts where the width of the uppercase letter "O" is 55% minimum and 110% maximum of the height of the uppercase letter "I".

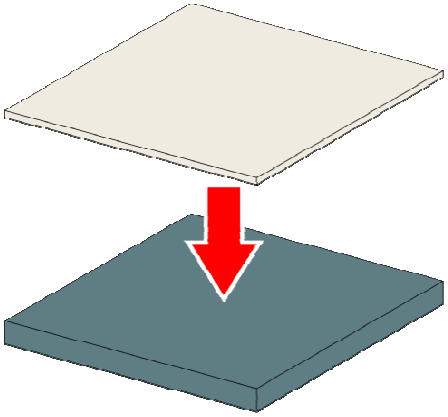
Stroke Thickness

Stroke thickness of the uppercase letter "I" shall be 15 percent maximum of the height of the character.

EXCEPTION: Where separate raised and visual characters with the same information are provided, raised character height shall be permitted to be ½" (13 mm) minimum.

Making ADA Signage-One Step at a Time

Base Plate: A base plate is the material directly behind tactile lettering, Braille and pictograms. It may be (but is not necessarily) the actual sign back that everything is attached to. The thickness, shape or size of the overall base plate is optional, so long as it is large enough to contain the necessary lettering, pictogram and Braille. It must also offer enough space around the entire contents so that the text isn't confused with whatever is around it. This means signs may be round/circles, squares, rectangles or other shapes. They may or may not be in frames.



Appliqué with adhesive backing
will be applied to the base plate

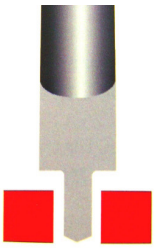
The base plate upon which the actual lettering, Braille, and/or pictograms are placed **must be a non-reflective matte finish and must not have any pattern to it that might distract from the lettering.** Rowmark ADA Alternative is made specifically for this purpose and meets Federal requirements. Other Rowmark products may also be used as a base. The material may be cut using a safety saw or vector cut using a laser or rotary engraver. Thicker materials, such as 1/8" stocks, may require multiple passes when vector cut with a rotary or laser engraver.

Cutting a Base Plate with a Rotary Engraver

- Secure a sheet of sacrificial plastic to the engraving table using table tape. It is very important this be securely mounted! Do not skimp on table tape.
- Using table tape, securely attach the material to be used as a base plate to the plastic table sheet.
- For cutting out the base plate, an "end mill" cutter should be used. End mill cutters leave an edge that is perfectly perpendicular (no bevel). These work well as finished edges and fit neatly into frames. An alternative to the end mill cutter is a "parallel" cutter. These provide a similar finished product, but are less aggressive. They are also easier to break. **Caution should be used when using these cutters, as they are extremely aggressive and if not adjusted properly, can be very dangerous. Always use safety glasses when working with engraving bits.** To reduce the breakage hazard, a .060" or .090" cutter is recommended. Adjust the cutter so it just barely passes through the thickness of the material being cut. Below is a conversion chart for depth settings:

  - 1/8" Thick materials (including ADA Alternative®): .125" (Cut at .130-.135")
  - 1/16" Thick materials: .625" (Cut at .675-.70")
  - 1/32" Thick materials: .03125" (Cut at .04")

End Mill Cutter
(.060 or .090)



Parallel cutter
(.060 or .090)

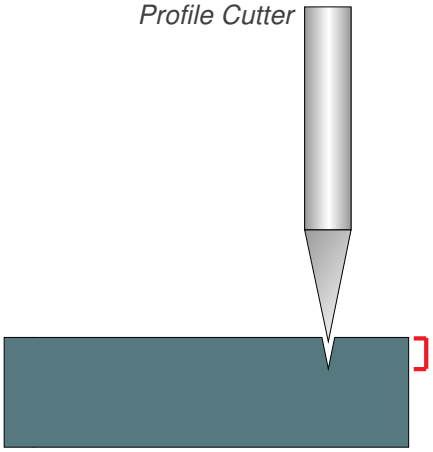
Cutting a Base Plate with a Rotary Engraver (cont.)

In addition to the parallel and end mill cutters, a profile cutter can be used to cut out a base plate. When using thicker gauge material for the base plate such as 1/8" thick sheets, it is best to cut out the base plate using several passes rather than one or two passes. Cutting too deep in one pass using a profile cutter will likely result in the engraver spindle locking up, and more than likely will break the profile bit.
When cutting with a profile bit, it is best to:

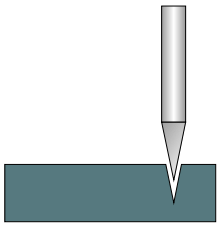
- Set the engraver's XY speed to the lowest speed possible. Also set the Z speed as low as possible too. Set the Z Dwell about ¾ all the way up to ensure the bit has enough time to bore into the material before it begins engraving. Keep the spindle speed at around ½ the way up to ensure proper cutting speed.
- Set the micrometer to .050" for the first pass
- With each additional pass, increase the depth .025" each time

Continue with as many passes as needed, still increasing the depth .025" for each pass until the base plate is cut all the way through. It should be .130-.135"

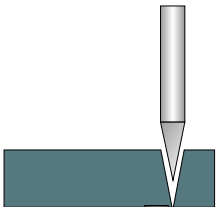
Profile Cutter



Begin with .050" depth for first pass and increase depth .025" for each additional pass.



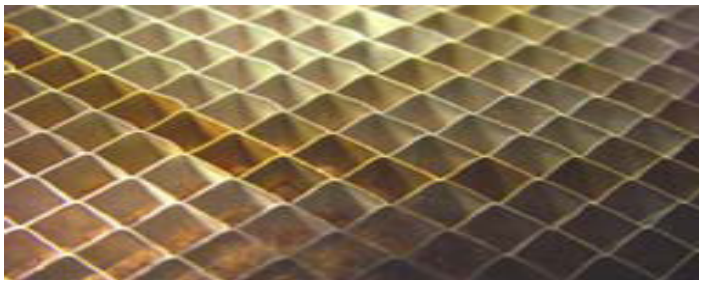
Profile bits produce a slight bevel on the edge of the material when finished cutting all the way through.

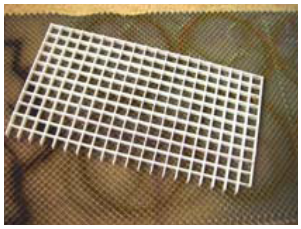


Cutting a Base plate with a Laser Engraver

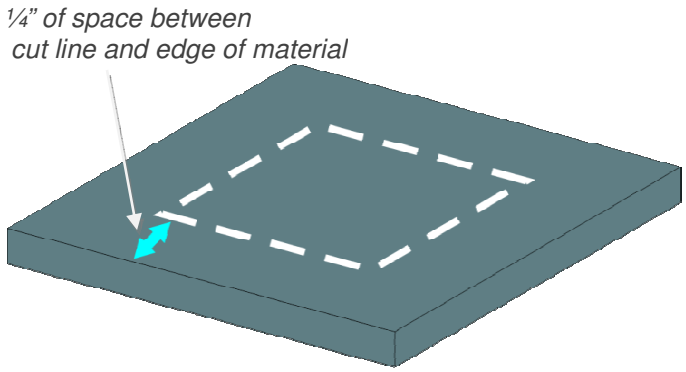
When a laser engraver is being used to make ADA signs, the lettering is usually cut first, then the base plate cut in a single process. This ensures perfect alignment and reduces the number of steps. However, there may be times when base plates need to be cut separately:

- Material must be flat and without bow or warp. Warping is usually due to improper storage and will cause an inconsistent cut. Always store these materials flat.
- When cutting plastics, a cutting grid should be used to raise the material up above the table at least 1/4". If you don't have a metal cutting grid, a florescent light lens from a home improvement center will work.
- Position material to be cut on cutting grid so there is at least 1/4" of material beyond cut lines. Placing a weight on the material to keep it from being accidentally moved is always a good safety precaution. However, some laser designs may not allow for this.





Cutting Grids



Cutting a Base plate with a Laser Engraver (cont.)

- Settings for lasers will vary according to the brand, wattage and design of the laser. If multiple lenses are available, the longest lens is usually preferred, although any lens from 1" to 2.5" should be acceptable. Some experimentation may be needed to find the best settings for the laser being used. The settings for most lasers will involve fairly high power and very low speeds. Low speed insures deep cuts and mechanical accuracy. (Example: For one 50-watt laser, a speed setting of 1.6% and a power setting of 50% works well for cutting out finished signs (5/32"). For one 25-watt laser, a speed setting of 1.4% and a power setting of 60% works well. Your laser will vary.)

- Air assist is not mandatory, but is highly recommended.

- Leave the protective film on the appliqué material to reduce discoloration or excessive smoke effects. If the protective film has already been removed, vinyl transfer tape will serve the same purpose. Proper settings will not cause any discoloration with most materials. Excessive smoke, melting or discoloration is an indication that too much power is being used or the speed needs to be increased.

- Cut edges should be glossy and smooth. If a matte finish is desired or cut marks need to be removed, use a sanding block with 220 grit sandpaper and lightly sand edges, being careful to keep the sanding block perpendicular to the plastic.

- Should the surface of the plastic need to be cleaned due to light smoke damage or other debris, use rubbing alcohol or a household cleaner such as Fantastic. For extreme cases, use acrylic polish #2 or Goo-Gone™. **Note:** Some materials such as clear acrylic are prone to cracking when using cleaners such as rubbing alcohol. Because alcohol is a drying agent, this can lead to cracks in the material when the alcohol evaporates. In these cases, using warm mildly soapy water would be best for cleaning.

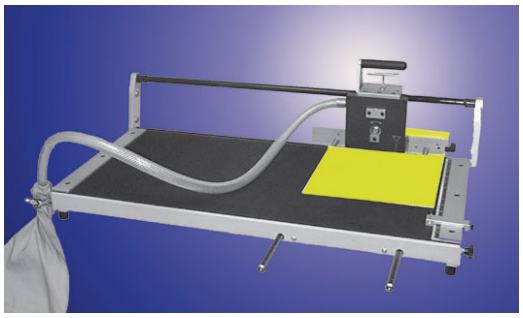
Cutting a Base plate with a Safety Saw

- Following the instructions that came with the saw, place the material on the table and draw the saw over the material in a slow, steady pace. Do not "rip" the material. Allow the blade to nibble at the material. This should eliminate any "chatter" that may result in chipping or poor cuts. Always hold the material securely while cutting.

- Thicker plastics cut with a saw may show cut marks. If these need to be removed, sand lightly, using 220 grit sandpaper while taking care to keep the sanding block perpendicular to the plastic.

- If radius corners are required, some thinner plastics may be punched using a radius corner cutter. Plastics up to 1/16" can be radius cut by most corner cutters or punches. It will probably be necessary to lightly sand corners after hand punching.

Radius Corner Rounder



Safety Saw

Cutting a Base plate with a Table Saw

- Although a safety saw is highly recommended for cutting engraving plastics, a table saw may be used, provided great care is taken and the sign blanks are not too small. Always leave all safety guards and devices operative.

- A table saw can accommodate many types of blades. For this purpose, using a multi-tooth blade intended for thin plastics or plastic laminates is best. Some people prefer to use a fine-toothed blade and turn it around backwards so it spins in the wrong direction. This causes the blade to act like a file rather than a saw blade. It is a trick often used when cutting extremely brittle plastics such as phenolic or Plexiglas®.

- When using a table saw, feed the material very slowly using a fence to maintain a straight cut. Since thin plastics often want to "chatter" or jump up and down while passing through the saw blade, it is important to keep a downward pressure on the plastic as it passes the blade. Chatter is the primary cause for chipping.

- Some people recommend placing a strip of masking tape over one or both sides of the plastic where the saw blade will pass. This helps reduce stress from the surface of the material, thus reducing chipping.

- A second way to reduce chatter is to use a fairly large piece of 3/4" plywood (or equivalent) with a handle attached to it as a means of pressing down on the plastic as it passes through the blade without getting hands or fingers too close. Adding a non-slip rubber pad similar to rubber shelf liner will keep the jig from slipping and help to control the movement of the plastic.

CAUTION: Cutting small pieces of plastic with a table saw is very dangerous. Small pieces of plastic that ride between the fence and the blade can easily fly back into the user's face, causing blindness or death.

Use extreme caution when cutting plastics with a table saw!

Table Saw

Cutting Tactile Lettering and Pictograms

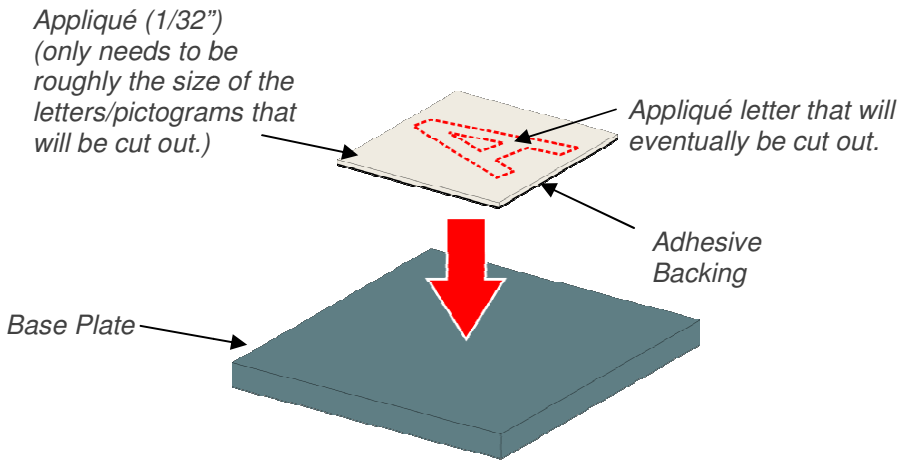
Letters and pictograms can be vector cut using either a laser or rotary engraver. Both produce excellent results. Lasers are faster and always cut a straight or perpendicular edge, while a rotary engraver generally leaves some bevel around the letters, depending on what type of cutter is being used.

Cut the appropriate size pieces using the same methods described above for cutting base plates. It is not always necessary to cut the appliqué pieces the same size as the base since the appliqué only needs to cover an area slightly larger than the area of the tactile lettering and/or the pictogram. This saves on material and reduces cost.

Preparing the material for cutting tactile lettering and pictograms:

- When preparing ADA appliqué for cutting on either rotary or laser engravers, remove any protective sheeting from the base plate (if any) and ensure the base plate is clean and dry. Any oil, dust or adhesive residue should be removed.
- If adhesive is not already applied to the back of the appliqué, apply enough adhesive to cover the entire back of the piece of appliqué.
- Scotch™ or 3M 467MP Hi Performance Adhesive works well for appliqué material.
- Do not remove the protective masking from the appliqué prior to cutting.
- Cut a piece of ADA Appliqué® material large enough to cover the areas required for lettering and/or pictogram. It is not necessary to cover the entire sign face. Apply the appliqué and lightly press together to ensure light but consistent contact across the entire surface. **This should not be done in advance! Apply the appliqué just prior to cutting and remove scrap (called weeding) immediately after**

cutting! (Failure to remove scrap/weeding may result in difficulty removing excess or residue left behind by the adhesive.)



Appliqué will be lightly adhered to base plate. Engraver will then cut out letters, pictograms, etc. The appliqué surrounding the letter will be "weeded" off of the base plate, leaving the cut out letter already attached to base plate.

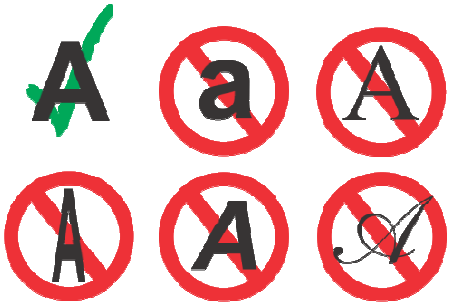
Additional information about Tactile

LETTER

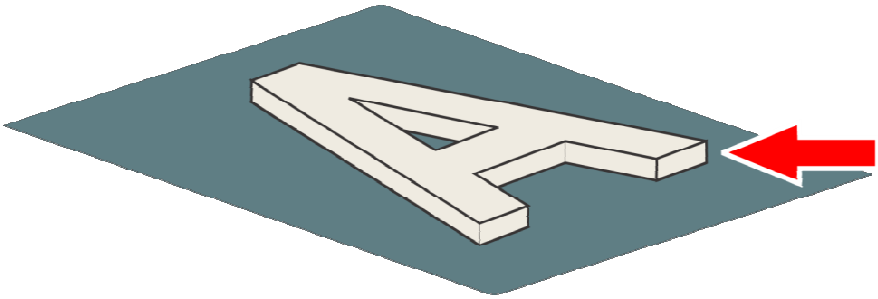
1/16” (1.6mm) minimum for beveled characters

LETTER

1/8” (3.2mm) minimum for strait sided characters



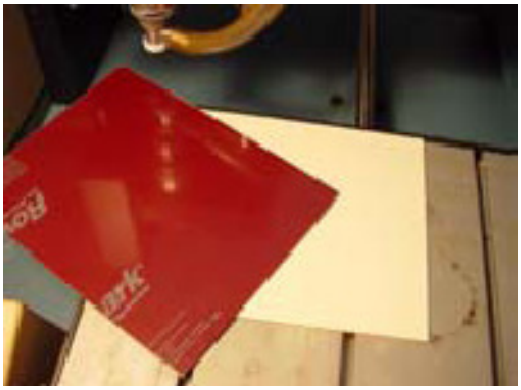
- *Upper case letters only*
- *Sans serif styles only*
- *Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms*



1/32” (0.8mm) minimum above the background

Cutting with a Rotary Engraver

- Using table tape, securely attach the prepared base plate and appliqué to the engraving table as you would any other engraving

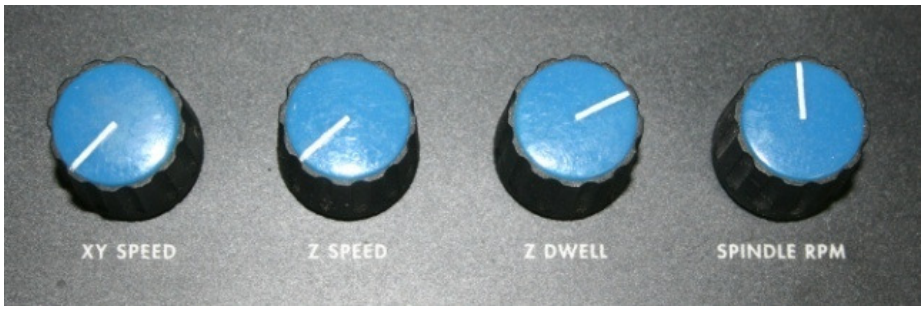


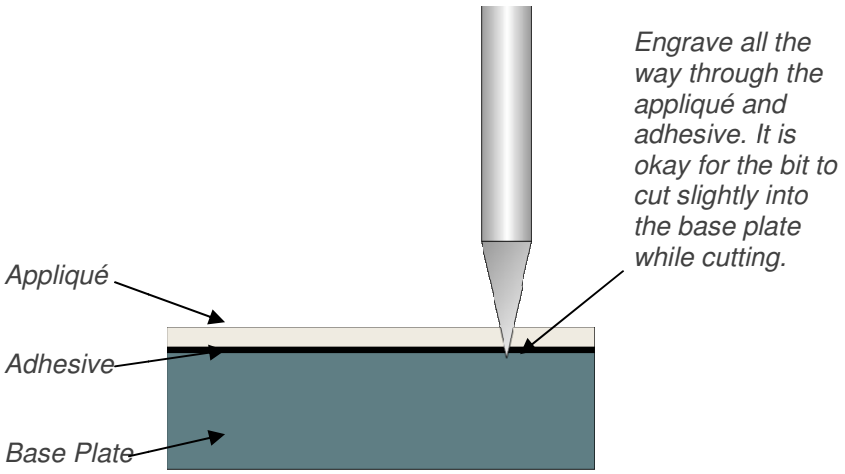
- Adjust cutter to a depth just adequate to cut through the ADA appliqué that is slightly more than the 1/32" thickness of the appliqué plus adhesive. A setting of .04"-.05" should be adequate. Many people use a "profile" or "letter cut-out" cutter for this function. A profile or letter cut-out cutter is designed for cutting and minimizes the amount of bevel left during the cut. If you don't have a profile cutter, a .020" plastic cutter does a good job.

- If you have a vacuum system on your engraving table, use it. Watch it carefully while cutting to ensure it remains open and does not clog.

Cutting with a Rotary Engraver (cont.)

- Adjust cutting (XY) speed to be fairly slow, allowing the cutter to nibble the plastic and not chew or tear it. Turning the XY speed dial ¼ the way up or less is a good speed to engrave with for this application. The adhesive between the two sheets must be cut cleanly all the way through. If a clean cut is not achieved with a single pass, adjust the cutter accordingly and run a second pass.

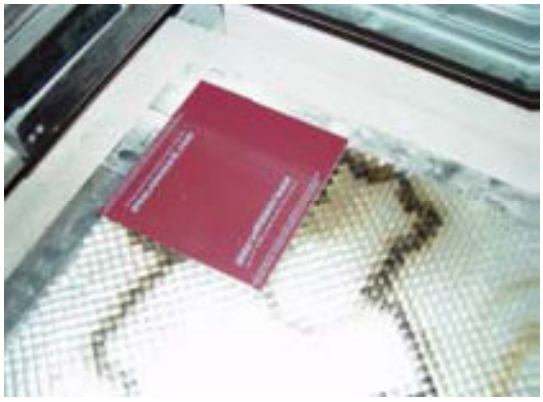




- Once the cut is completed, remove excess material immediately. The adhesive used on ADA appliqué is specially designed for easy initial release, but as time passes, it will continue to cure, making it more and more difficult to weed (remove) unwanted pieces. Using a sharp instrument to “pop off” excess material is helpful (an X-Acto® knife works well). Be careful not to scratch the base plate in the process.

Cutting with a Laser Engraver

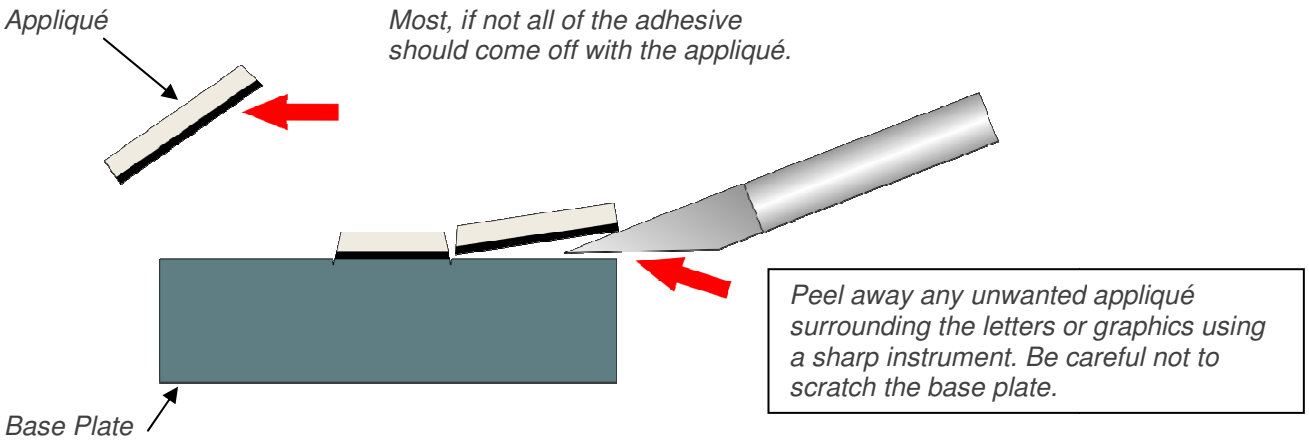
- Prepare sign as described above. Place sign in laser the same as any other job.
- Leaving the protective film on the appliqué is recommended. Should smoke damage or discoloration occur, it is the result of excessive heat, slow speed or because the appliqué was not pressed down evenly across the surface, allowing a thin layer of air between the appliqué and the base plate. These discolorations can be easily removed using Novus #2 Acrylic Scratch Remover.
- Focus laser to the top of the ADA appliqué and adjust power and speed so the laser will cut through the appliqué and adhesive, but will not cut excessively into the base plate.



- Most people prefer to use air assist if they have it.
- After running your laser, check to ensure all letters cut completely through. If not, a second pass may be run, but power and/or speed settings should be reduced to ensure the cut only penetrates slightly into the base plate.

- Once the cut is completed, remove excess material immediately. The adhesive used on ADA appliqué is specially designed for easy release initially, but as time passes, it will continue to cure making it more and more difficult to remove unwanted pieces. Using a sharp instrument such as an X-Acto knife to “pop off” excess material is helpful. Be careful not to scratch the base plate in the process.
- Goo-Gone® can be used to clean up any remaining adhesive, but do not apply chemicals such as alcohol or Goo-Gone directly to the sign. Apply the cleaning product to a cotton rag, paper towel, or cotton swab and clean the sign. Excessive use of chemicals may cause tactile letters not to secure properly.
- After the unwanted material has been removed, press remaining appliqué to ensure proper bonding. This may be done manually or in a press. Although adhesive will not fully cure for several days, the adhesive is immediately secure enough that the sign may be put into use.

Weeding Off the Surrounding Appliqué



- Remove any protective masking still remaining on the tactile lettering or pictograms.
- Goo-Gone® can be used to clean up any remaining adhesive, but do not apply chemicals such as alcohol or Goo-Gone directly to the sign. Apply the cleaning product to a cotton rag, paper towel, or cotton swab and clean the sign. Excessive use of chemicals may cause tactile letters not to secure properly.
- After the unwanted material has been removed, press remaining appliqué to ensure proper bonding. This may be done manually or in a press. Although adhesive will not fully cure for several days, the adhesive is immediately secure enough that the sign may be put into use.

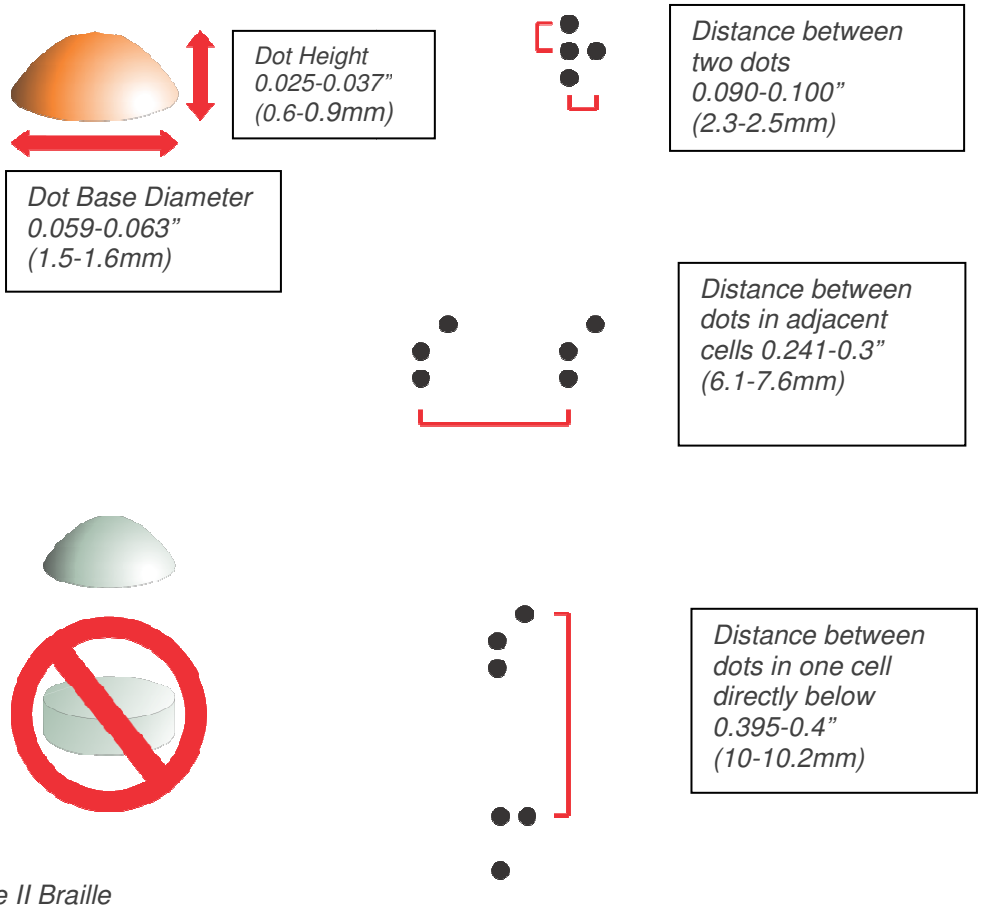
Applying Braille to the ADA sign

According to the ADA standards, grade II Braille must be used on the signs in order to be ADA compliant. Grade I Braille is a direct translation and often results in longer lines of Braille. Grade II Braille is not a direct translation and therefore is a more efficient use of Braille that saves the reader time. For the sign maker, it saves time during fabrication.

Grade II Braille may be obtained in three methods:

- Rotary engraving
- Raster Dot application
- By appliqué

Dot height, diameter, and distance

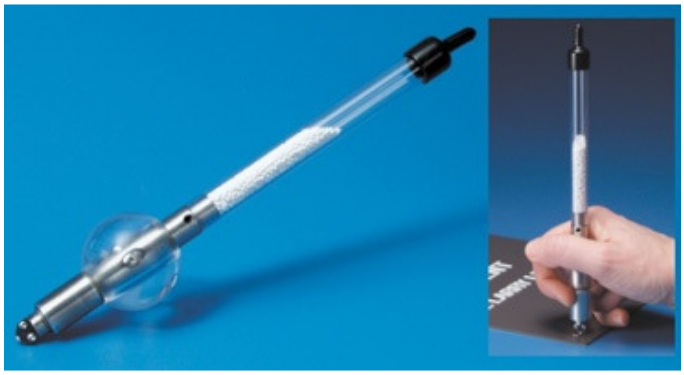


Raster Dot application (cont.)

Braille bit for rotary engravers

Raster Dots

Many engraving software programs have a feature that will translate text into Braille for you. Make sure the feature is set to use Grade II Braille. Then you can set up the engraver with the Braille bit to drill out the holes for the raster beads to then be pressed in using a pen applicator.



If you're engraving software does not have this feature, other software programs can be purchased for translating Braille. The Duxbury Translator is one program that is often recommended for Braille translation. A drawback to translation programs is that they often cost a lot of money to purchase. Also a license can be required to use Braille as well. Like all translation programs, there can sometimes be errors in the translation. It is good, if possible, to have a certified Braille translator to look over the translation to ensure that it is correct.

Appliqué Braille

This method is the simplest of all – have the strips made of embossed Braille with an adhesive back. Just peel and stick. The downside of these is that you must allow time for them to be made and shipped. A wide variety of colors are available. No special software or tools are required for this method.

Raster Dot Application

This process is a patented and licensed procedure that uses a tiny plastic or metal ball measuring .09” in diameter to create the Braille. The ball creates a rounded dot as specified in the regulations. The process requires a rotary engraver with a special adapter that holds a drill bit for drilling holes where the dots will be inserted. Or a special rotary drill bit for Braille can be used in the regular spindle as is. This is the preferred method for creating Braille. It does require the purchase of a fairly expensive license, so it is restricted to the serious user.

Holes for raster dots can be made using a laser, although some experimentation will be needed to obtain the proper diameter and depth to ensure the ball sits permanently and remains exposed from .025” - .037” above the base plate.

Now that the sign is made…

Interior & Exterior Permanent Room/Space Identification Signs
Guidelines for Sign Installation Height & Locations

- Tactile characters on signs shall be located 48” (1220mm) min AFF (above finished floor) or ground surface, measured from the baseline of the lowest tactile character and 60” (1525mm) max AFF or ground surface, measured from the baseline of the highest tactile character.
- Where a tactile sign is provided at a door, the sign shall be located alongside the door at the latch side.
- Where a tactile sign is provided at double doors with two active leafs, the sign shall be located to the right of the right hand door.
- Where there is no wall space at the latch side of a single door or at the right side of double doors, signs shall be located on the nearest adjacent wall.
- Signs containing tactile characters shall be located so that a clear floor space of 18”(455mm) min by 18” (455mm) min centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position.

NOTE: Signs with tactile characters shall be permitted on the push side of doors with closers and without hold-open devices.

For details about mounting signs in more complex environments, visit www.usdoj.gov/crt/ada.

This document is based on public documentation available through the 2010 Standards for Accessible Design and interpretation of these guidelines. The information contained should not be misconstrued as legal advice on conformance with any laws, regulations, codes or guidelines. Rowmark recommends contacting the local municipality for questions regarding conformance.