Rowmark®
Great people. Great plastic.

MAKING AN ADA SIGN

The American Disabilities Act (ADA) was initiated in 1992. It requires all public places (except government buildings and churches) to install ADA signage that include tactile lettering, Grade II Braille and in some cases, pictograms. For a better understanding, you should have a copy of the portion of the ADA regulation pertaining to signage. You may download these pages from clicking here: 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 4.3. This document comes from the official government website for ADA compliance at www.usdoj.gov/crt/ada. This site has a great deal of information about ADA compliance for your business and information that will help you relay accurate information 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.

Although the presence of such regulations is intimidating, don't be discouraged about making ADA signs. Like many government regulations, these are more intimidating than difficult.

There are several criteria that must be met for a sign to meet ADA requirements:

1. 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 to make the sign more attractive, but the ADA portion of the sign must be of a non-reflective material. A glossimeter is 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. By using the chart (Fig A), you can be sure your signs meet the requirements. Substituting other materials that look the same to the naked eye may or may not meet these requirements, so follow the chart recommendations carefully.

2. It is required to have a contrast ratio of 70% between the tactile lettering and the background behind them. This means using dark

letters on a light background or light letters on a dark background. This is to assist the visually impaired, but not totally blind person, to see and read the letters more easily. Please see Rowmark's color contrast matrix for contrast suggestions. In short, the more contrast, the better. Once again, substituting materials that look the same to the naked eye may or may not meet these requirements, so follow the chart recommendations carefully.

3. Size of letters is also specified. The thickness of the tactile lettering must be 1/32". Letters shall be upper case. The smallest letter permitted in an ADA wall sign is 5/8" tall. The largest is 2" tall. Anything outside those dimensions is unacceptable. Hanging signs or projection signs follow a different set of regulations.

4. The type style or font is also specified. Although you are not restricted to a single font, the type style family is very specific. Fonts shall be "sans serif" or "simple serif" in design. This means no italics, no scripts, nothing fancy and nothing exaggerated. Remember, this is something the blind should be able to follow easily using their fingers. *Note:* There is no restriction about other lettering, type styles, photographs or logos also being used on a sign, so long as the required text is present in a form that is not confusing and meets the necessary requirements.

5. The type style has requirements beyond 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 while the up stroke width to height of the letter must be 1:1.5 to 1:10. These dimensions can be easily measured using a micrometer but fonts like Helvetica Medium and Futura Regular are generally accepted as meeting these requirements.

When fabricating an ADA sign, there are several elements that are involved:

1. Base Plate: The platform everything else is attached to.

2. 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.

3. 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.

4. 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
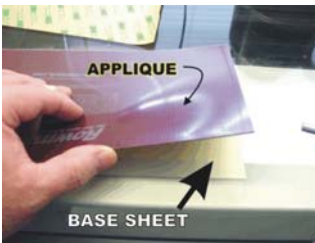
numbers, etc. would not require pictograms. Restroom signs, phone signs, no smoking signs, etc. do.

There are several rules that govern the construction and design of ADA signage. These must be followed carefully. Click ADA Rules for a copy of the latest regulations.

- Creativity in design: Although early ADA signs were very basic and lacked in design, the regulations were never intended to eliminate creativity, beauty, the use of photographs or other design elements provided certain rules are maintained.

- Who is in charge of inspections? Local inspections of ADA compliance are left up to the local Building Inspectors of the community in which the signage is located. Some localities are much more restrictive than others. If at all possible, it is highly recommended that sign makers and designers meet with their local Building Inspectors and offer to work as a team to ensure compliance. Since many Inspectors have a limited knowledge of how ADA signs are made and may have a very limited understanding of the regulations themselves, so a cooperative effort can be beneficial for everyone. There are also Federal Inspectors hired solely for the purpose of ensuring compliance. They usually travel to places where complaints or lawsuits have been filed.

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, and while offering enough space around the entire contents so that the text isn't confused with whatever is around it. This means signs may be round, square, rectangles or other shapes. They may or may not be in frames.

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. Check the Chart in Fig. A for alternatives.

The materials recommended above as base plates 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 rotary or laser engraver.

To cut a base plate with a rotary engraver:
1. Obtain and mount a sheet of scrap plastic to the engraving table using table tape. It is very important this be securely mounted! Do not skimp on table tape.
2. Using table tape, securely attach the material to be used as a base plate to the scrap plastic sheet.
3. Ideally, an "end mill" cutter should be used for this purpose. End mills 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 with either of these cutters, as they are extremely aggressive and if not adjusted properly, can be very dangerous. Always use safety glasses when
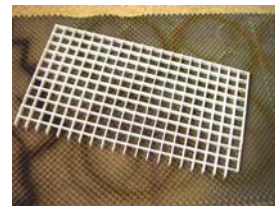

End Mill cutter

Parallel cutter

working with these cutters. 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")
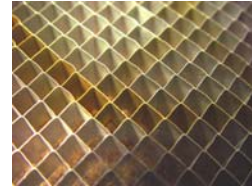   1/32" Thick materials: .03125" (Cut at .04")

To cut 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):
1. 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.

2. 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.
3. 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.

4. 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"). A setting of 60% power and 1.4% speed works in one 25-watt laser. Your laser will vary.)

5. Air assist is not mandatory but is highly recommended.

6. 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.

7. 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.

8. 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™.

Cutting base plates with a safety saw:
1. 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.

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

3. 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.

Cutting base plates with a table saw:
1. 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.

2. 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®.

3. 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.

4. 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 and thus reduces chipping.

5. 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 with cutting plastics with a table saw!

Cutting Tactile Lettering and Pictograms:

These 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.
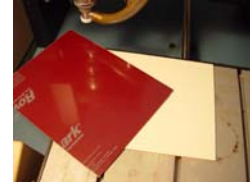
Preparing the material for cutting tactile lettering and pictograms:
1. When preparing ADA appliqué for cutting on either rotary or laser engravers, remove any protective sheeting from the base plate (if any) and ensure the base plate is clean and dry. Any oil, dust or adhesive residue should be removed.
2. Do not remove the protective masking from the appliqué prior to cutting.

3. Cut a piece of ADA appliqué 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 srcap/weeding may result in difficulty removing excess or residue left behind by the adhesive.)

When cutting with a rotary engraver:

1. Using table tape, securely attach the prepared base plate and appliqué to the engraving table as you would any other engraving job.
2. 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.
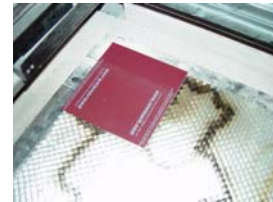3. If you have a vacuum system on your engraving table, use it. Watch it carefully while cutting to ensure it remains open and does not clog.
4. Adjust cutting speed to be fairly slow allowing the cutter to nibble the plastic and not chew or tear it. The adhesive between the two sheets must be cut cleanly all the way through. If a clean cut is not achieved with a single pass, adjust the cutter accordingly and run a second pass.
5. 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 remove (weed) 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.
6. Remove any protective masking still remaining on the tactile lettering or pictograms.
7. 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 paper towel or cotton swab and clean the sign. Excessive use of chemicals may cause tactile letters not to secure properly.
8. 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.

Cutting Tactile Lettering and Pictograms with a Laser Engraver:

1. Prepare sign as described above. Place sign in laser the same as any other job.
2. 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.
3. 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.
4. Most people prefer to use air assist if they have it.
5. After running your laser, check to ensure all letters cut completely through. If not, a second pass may be run but power settings should be reduced to ensure the cut only penetrates slightly into the base plate.
6. 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.
7. 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 paper towel or cotton swab and clean the sign. Excessive use of chemicals may cause tactile letters not to secure properly.
8. 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.
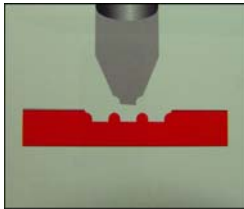
Braille:

Grade II Braille may be obtained in three methods:
1. Rotary engraved
2. Raster Dot application
3. By appliqué

1. Rotary Engraved Braille:

One of the earliest forms of creating Braille was with a rotary engraver. This produces a recessed space leaving the Braille dots raised to the surface layer of the base plate. It is durable, inconspicuous and inexpensive.

Most rotary engraving companies offer special Braille translation software that will perform the necessary tasks for creating readable Braille. Likewise, cutter companies offer a special cutter for routing out the space behind the dots. When adjusted properly, the remaining dot is perfectly sized. To ensure accurate size, check it with a micrometer. It should read .09" with an equal amount of space between the dots.

The problem with rotary engraved Braille is that it leaves a flat "dot". The surface of the dot is not rounded, as true Braille should be. Although some areas are tolerant of this, proposed changes to the ADA Regulations will require a rounded dot, which is very difficult to achieve with rotary cutters currently on the market. Although this is not yet required and many inspectors may overlook this fact, so long as the edges are not sharp, once the new Regulations are passed, engraved Braille as we know it, will no longer meet the requirements.

2. 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. 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 .017" - .022" above the base plate.

3. Appliqué:

This method is the simplest of all – have someone else to make strips 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.

Now that the sign is made:

Where ADA signs are mounted is important. When possible, they should be mounted on the wall next to the appropriate door, next to the door handle and mounted so there is 60" from the floor to the center of the sign, and 3" from the door frame. When double doors are being marked, the sign should be to the right of the door. If there is no space to mount the sign as described above, it should be mounted on the nearest adjacent wall. For details about mounting signs in more complex environments, visit www.usdoj.gov/crt/ada.

Tactile Lettering is not just for ADA:

Although this installment has talked about ADA compliant signage, ADA Alternative® can be used to make all kinds of signage beyond tactile.   Tactile lettering is a great alternative to engraved signs. They are fast to make, unique and allow for a wide range of color combinations that might not otherwise be available. When doing non-ADA compliant signage, gloss finishes, metallics and reverse engravable materials may be used to create inventive, stylish signs and displays. The tactile lettering allows for multiple dimensions and, when mixed with other substrates, a variety of textures as well.