COMBINING PLASTIC SUBSTRATES & UV-LED PRINTING TO MAKE ADA COMPLIANT SIGNAGE
What is the Americans with Disabilities Act (ADA)?

The Americans with Disabilities Act (ADA) is a civil rights law that was initiated in 1992 to “prohibit discrimination and ensure equal opportunity for persons with disabilities in employment, State and local government services, public accommodations, commercial facilities, and transportation,” according to ada.gov. Since then, the Department of Justice has updated the ADA regulations (title III) that are now in effect as of March 15, 2011.

How does the ADA relate to signage?

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. The term “ADA signs” is commonly used in reference to the construction, architectural and signage industries.

All signage that is considered “architectural” must comply with ADA signage guidelines, as it identifies a permanent room in a facility. Signage that is used to identify temporary or changing information, such as room descriptions, company logos and identification or individual’s names, do not have to meet ADA signage regulations.

Requirements to be ADA Compliant

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 in the design of the sign. However, the ADA portion of the sign must be made of a non-reflective material.

2. 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 letters and pictograms more easily.

3. Tactile type faces and fonts for words and numerals shall be raised 1/32”, uppercase font, and sans serif type only. Italic, scripts or decorative type fonts cannot be used. This typeface is meant for the blind and visually impaired to read easily.

4. Pictograms should accompany the verbal description of the sign. The border dimension of the pictogram shall be 6 inches minimum in height. The verbal description should be placed directly below the pictogram. The type should also be accompanied with Grade II Braille. Braille is a system of raised dots arranged in cells that convey particular letters, words, numbers or symbols. Grade II Braille is characterized by contractions that greatly reduce the number of characters used to shorten words and save space. Unlike Grade I, Grade II Braille is not a direct translation of letters or a one-to-one conversion.

5. 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.
Basic elements of making an ADA compliant sign

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.

3. **Braille:** There are three types of Braille. ADA regulations require Grade II Braille. This is a Braille that allows for contractions that greatly reduce the number of characters used. Unlike Grade I, Grade II Braille is not a direct translation of letters.

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, they are not required to be tactile; yet they are required to fit in a field that is a minimum of 6 inches in height. Pictograms are not required on all signs. General office signs, room numbers, etc. that are not associated with an international symbol would not require pictograms. Restroom signs, phone signs, no smoking signs, etc. do require them.

Many methods are available for making compliant Americans with Disabilities Act (ADA) signage that meets ADA guidelines.

The most popular methods for creating an ADA compliant sign include photopolymer, the Raster® Braille Method and DTS UV-LED Digital Printing. These have been widely accepted as practical techniques to create braille signage.

There are four main steps to the multistep process of creating a photopolymer sign - artwork design, film generation, photopolymer processing and finishing. Results can be very durable and aesthetically acceptable. The Raster® Braille System method is a patented process that requires you to be a licensed user in order to apply Braille on signs. This method requires the user to insert raster braille beads with hand tools, a Raster® Pen or a computerized engraver in a secondary operation- also making it a multistep process. The Raster® Braille method can be easily applied to short run jobs or one-off designs, which is part of the popularity of this process.

With the recent development of tactile and raised UV-LED printing, compliant braille signage can be created with an even greater graphics appeal and in a single process requiring minimal operator involvement. A popular method is to print the required raised letters and braille with UV curable ink to the “first-surface” of the sign. An alternative method is to print graphic elements to the back “second-surface” or “sub-surface,” adding multiple colors and creativity while applying the raised components to the “first” or “top” surface in a two-step process. The ability to create endless designs will build appeal for and acceptance of this new method. These UV-LED printing techniques are ideally suited to plastic substrates, which are cost-effective and a non-proprietary solution open to UV printer users.
Here are many of the reasons to use UV-LED printing as a production method for ADA compliant signs.

1. **Single pass printing simplifies the process.**

As noted, other ADA signage production techniques require multiple steps, labor and additional equipment. Printing only requires the UV-LED printer and the fewest number of steps.

2. **Printing reduces total production time.**

A UV-LED printer can create a standard 6”x8” sign with Braille and raised tactile letters in less than four minutes.

3. **Works with plastic substrates.**

One of the great advantages of printing on ADA compliant plastic substrates for ADA projects is the wide range of colored single-ply (mono) sheets available. This means that print jobs can be very quick, and there is no need to print large areas of color. Ink usage is also reduced, and cost can easily be below other production methods. These substrates are already matte finish to meet ADA guidelines.

   *You can use other materials you have, and the UV-LED printer can make them compliant through the printing process. As an example, if you have a gloss finished plastic or metal substrate, the printer can print a matte color overlay to make the sign meet regulations.*

4. **You can match existing designs.**

Printed signs oftentimes can match signs already produced that were created with photopolymer or the Raster® Method, through the simple creation of a digital design file and an endless selection of UV-LED ink colors. The ability to easily create signs that are consistent with existing designs makes printing a plus.

**Why use plastic substrates?**

Plastic print media is the right choice for applications that require one or more of the following characteristics:

- Water resistance
- Solvent resistance
- Tear resistance
- Heat resistance
- Optical clarity
- Outdoor weatherability
- UV stability

Acrylics are the dependable choice as a base substrate to create and fabricate ADA compliant signage that lasts and meets regulations. Acrylics are also the perfect complement to UV-LED print technology, as with the right equipment, UV-LED ink
creates a lasting, tamper resistant bond to the acrylic surface. Other benefits of acrylic are that they can be easily fabricated with laser engravers, routers and rotary cutters to create unique shapes and designs.

A UV-LED printer, coupled with the proper cutting technology, can open up new opportunities for business owners. No longer do signs need to be simple and mundane. Adding color and shapes helps increase profitability with all types of projects.

Acrylic is also the preferred substrate for public environments where signage must be properly cleaned and sanitized. Environments such as education, medical and corporate all appreciate the benefits of acrylic because graphic designs and visuals can be printed on the back “subsurface” or “second” surface of the acrylic, while the first surface that is exposed can be easily maintained and cleaned. In other words, when durability is required, plastic is the choice. For all of these reasons, the number one substrate choice for UV-LED printers today is acrylic sheet.

Summary

For a comprehensive overview comparing all three ADA compliant sign-making methods, including UV-LED printing, the Raster® Method and Photopolymer, see the chart on the next page. This chart compares many key factors that require consideration when producing an ADA signage project, including the equipment requirements, production time and costs, dry time and more.
# ADA Braille Comparison

**UV-LED Printing • Raster Method • Photopolymer**

<table>
<thead>
<tr>
<th>Manufacture Process</th>
<th>UV-LED PRINT</th>
<th>APPLIED SIGNS</th>
<th>PHOTOPOLYMER SIGNS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Artwork design</td>
<td>Artwork design</td>
<td>Artwork design</td>
</tr>
<tr>
<td>Dry Time</td>
<td>None</td>
<td>In some cases</td>
<td>In some cases</td>
</tr>
<tr>
<td>Required Equipment</td>
<td>Requires less space for production</td>
<td>Requires more space for production</td>
<td>Requires the most space for production</td>
</tr>
<tr>
<td></td>
<td>UV-LED Printer</td>
<td>Raster Braille kit</td>
<td>Darkroom/image setter</td>
</tr>
<tr>
<td>Number of Components for Final Product</td>
<td>Two components</td>
<td>Three components</td>
<td>Four components</td>
</tr>
<tr>
<td></td>
<td>Substrate</td>
<td>Substrate</td>
<td>Substrate</td>
</tr>
<tr>
<td></td>
<td>Inkjet</td>
<td>Raster Beads</td>
<td>Inkjet/inkjet</td>
</tr>
<tr>
<td>Ease of Meeting ADA Compliance</td>
<td>Ink drops form ADA-compliant rounded Braille</td>
<td>Raster beads form ADA-compliant rounded Braille</td>
<td>Difficult to form the precise rounded shape of the Braille that is ADA-compliant</td>
</tr>
<tr>
<td>Setup Cost</td>
<td>No added cost</td>
<td>No added cost</td>
<td>No added cost</td>
</tr>
<tr>
<td>Ability to Color Match</td>
<td>Software enables quick &amp; simple color matching on all color types. Also stores colors for each results on repeat jobs</td>
<td>Easy set and standard colors available</td>
<td>Color matching can be challenging and costly for small run sizes</td>
</tr>
<tr>
<td>Durability</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Production Time</td>
<td>Low: Braille raised letters, and any images are all done on the printer. No extra steps or equipment changes</td>
<td>Medium: Engraving and insertion of the beads are done separately and possibly on different machines</td>
<td>High: multi-step process and labor intensive</td>
</tr>
<tr>
<td>Production Cost</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Ability to Add Complex Graphics</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Intellectual Property Required</td>
<td>No</td>
<td>Yes: requires a license and agreement forms</td>
<td>No</td>
</tr>
<tr>
<td>Scrap Rate</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
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</tbody>
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