



SEGD ADA White Paper Update 2007

Guidelines, Best Practices, and Innovation for Signs for the Blind and Visually Impaired

Sponsored by ASI-Modulex with Dixie Graphics, Nova Polymers, and Accent Signage Systems

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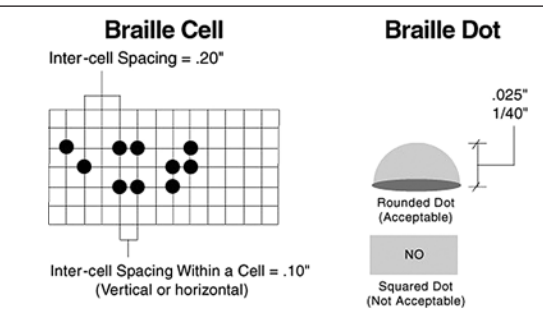
Because of the complexity of Braille and the very small number of Braille users in the population (less than 2/10 of 1% of the population), working with Braille is very difficult for most designers and fabricators. Most fabricators use software that turns text into properly-positioned Braille; they rely on that software to be correct. But the results often include mistakes. So to develop Braille on signs, designers should know the different types of Braille.

Grade 1 Braille

Grade 1 Braille is in full spelling and consists of the letters of the alphabet, punctuation, numbers, and a number of composition signs that are special to Braille. Grade 1 Braille is often used by students new to Braille

Grade 2 Braille

Grade 2 Braille consists of Grade 1 Braille and 189 contractions and short-form words, and is often known as "English Braille". Grade 2 Braille is permitted on ADA signs in most states (703.3).



California Braille

California's Title 24 requires Braille specifications that differ from ADAAG standards:

- 0.1 inch is required between each dot within a cell, measured from the dot centers
- 0.2 inches is required between each cell within a word
- dots must be a minimum of 0.025 inches high at the apex

◀ California Braille

Braille Spacing

Except for California Braille, which has its own spacing grade, the ADAAG sets specific parameters for the spacing of Braille.

Braille Dimensions Measurement Range (703.3.1)

Measurement Range	Min. in inches/Max. in inches
Dot base diameter	0.059 (1.5 mm) to 0.063 (1.6 mm)
Distance between two dots in the same cell	0.090 (2.3 mm) to 0.100 (2.5 mm)
Distance between corr. dots in adjacent cells	0.241 (6.1 mm) to 0.300 (7.6 mm)*
Dot height	0.025 (0.6 mm) to 0.037 (0.9 mm)
Distance between dots from one cell directly below	0.395 (10.0 mm) to 0.400 (10.2 mm)

*Measured center to center

Braille Capitalization

Braille has upper and lower case type that can be used in sentences. The indication of an uppercase letter or letters should only be used before the first word of sentences, proper nouns and names, individual letters of the alphabet, initials, and acronyms.

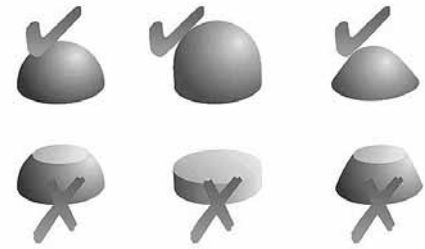
Braille Doming and Rounding

Braille is required to be domed or rounded (703.3.1). This means that the profile of the Braille must be a curved surface to allow for accuracy in reading.



Note on Title 21

A number of sign fabricators have commented that the standards for doming or rounding in California may be more stringent than the ADAAG standards in their enforcement. Please consult a local California enforcement official to get a better ruling.



Types of permissible domed Braille (provided by ASI-Modulex) >

Specification and Manufacture of Braille

Currently there are three major manufacturing approaches used to create Braille on signs, all widely available through numerous sign companies and suppliers. All three methods comply with ADAAG requirements and have been approved in sign programs since the original ADAAG in 1990.



Raster Braille™

Raster™ Braille works with existing engraving/routing machines and software by converting text data into Braille, pre-drilling holes, and inserting precision Rasters™ into place. Using plastic or acrylic materials requires no adhesives as the spheres are held in place by friction. In substrates other than plastics, such as metals, optically clear adhesive can be used to secure Rasters™ in place. Nearly any materials can be used and the finished product will conform to ADA requirements. Raster™ Braille uses precision-engineered spheres, manufactured to meet the ADA height guidelines for Grade II domed Braille of 0.25-0.031" after being inserted. Raster Braille is appropriate for indoor and outdoor use.

For more information, contact John Souter of Accent Sign Systems at 612.377.9156.

< Raster™ Braille manufacturing process



Photopolymer

Photopolymer is a photosensitive synthetic compound that hardens when exposed to an ultraviolet light source. A clear, high-resolution photopolymer sheet is bonded to any of a variety of base substrates. Computer generated artwork is output to a film negative, placed on the surface of the photopolymer sheet, and exposed to ultraviolet light, hardening the raised area. This exposure creates an integral bond between the photopolymer and the base substrate. Finally, the unexposed photopolymer is washed away with tap water, leaving the raised area.

A rounded or domed effect can be achieved by generating film negatives using Braille translation software designed for photopolymer, following proper exposure techniques, and applying an adequate topcoat over the surface of the sign. The topcoat layer must have a 2 mm minimum coat of acrylic polyurethane paint or a satin clear coat to achieve adequate coverage. Exterior grade photopolymer is also available for outdoor use.

For more information, contact Michael Santos of Nova Polymers at 973.882.7890.

< Polymer sign (fabricated by Acorn Signs)

Chemical Etching and Engraving

Chemical etching is most commonly done with zinc but can also be done with brass, copper, steel, and magnesium. (Aluminum is the only commonly used material on which etching is not feasible.) In the etching process, the messaging and Braille dots are printed onto a flat sheet by a high-powered UV light shone through a film negative. The flat

sheet is then placed into a bath consisting of nitric acid, water, and an oil-based additive. While in the bath, the imaged areas remain raised. When etched, the raised copy and Braille are left with a slightly angled shoulder (as opposed to a 90-degree drop) from the top of the character to the floor of the sign. The top of the Braille dot is sanded off, thus making it necessary to dome the Braille dots with a pneumatic paint pen tool.

For more information, contact Matt Williams of Dixie Graphics at 615.832.7000.

◀ *Zinc chemical-etched sign at the A. A. Birch Courthouse in Nashville, TN (Architect: Gresham, Smith and Partners. Manufacturer: Dixie Graphics)*



Other Methodologies

There are other methodologies being developed that may be applicable for creating Braille. Molded plastic is currently being employed in a number of sign shops as well as mechanical etching on metal using sand blasting. Since both are just beginning to be used commercially, it is important to conduct research on how these technologies fit with the ADAAG requirements.

For more information, contact Craig Berger at craig@segd.org.

Summary of Recommendations

- When selecting a material or manufacturing process, make sure that all Braille rounding or doming specifications are in place.
- When using Braille software, employ an ADA expert early in the process to check if the software is working properly. Repeat this check at the conclusion of every large project.
- If working on a large municipal or institutional project, work with a local council for the blind during the prototype stage to see if the Braille signs can be easily read.
- Consult with local code officials about specific Braille requirements for the jurisdiction, especially in states such as California.

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