

The Commission Internationale de l'Eclairage (CIE) (English: International Commission on Illumination) chromaticity coordinates (x,y), defining

the corners of the Fluorescent Pink daytime color region are as follows:

x	y
0.450	0.270

x	y
0.590	0.350
0.644	0.290
0.536	0.230

	Luminance factor limits (Y)				
	D ₆₅			D ₁₅₀	
	Min	Max	Y _F	Min	Max
	25	none	15	25	none

Fluorescent materials differ from non-fluorescent materials in that the total luminance is the sum of the luminances due to reflection and fluorescence. The luminance factor Y of such materials is the sum of the luminance due to reflection (Y_R) and the luminance due to fluorescence (Y_F). Therefore, Y=Y_R+Y_F. If the value Y_F is greater than zero, the material is fluorescent; if Y_F equals zero, then the luminance factor Y is equal to Y_R.

These four pairs of chromaticity coordinates determine the acceptable color in terms of CIE 1931 Standard Colorimetric System (2 degree standard observer) measured with CIE Standard Illuminant D65 in accordance with the American Society for Testing Materials (ASTM) standard E991. In addition, the color shall be fluorescent, as determined by ASTM E1247.⁴ The FHWA amends title 23, Code of Federal Regulations, part 655, appendix to subpart F, to add chromaticity coordinates and luminance factor limits for the color of fluorescent pink retroreflective sign materials.

Additionally, to be consistent with Section 2C.42 Playground Sign (W15-1), the FHWA adds "playground warning" to the list of signs assigned the fluorescent yellow-green color.

9. In Section 1A.13 Definitions of Words and Phrases in This Manual, the FHWA revises definitions in the STANDARD statement for: "Active Grade Crossing Warning System," "Average Day," "Beacon," "Crosswalk," "Highway Traffic Signal," "Raised Pavement Marker," "Road User," "Shared-Use Path," "Sidewalk," "Sign Illumination" and "Traffic Control Device" to better reflect accepted practice and terminologies and to provide consistency between the

definitions shown here and in other parts of the Manual. Additionally, the FHWA adds definitions for "Crashworthy," "Detectable," "Inherently Low Emission Vehicle (ILEV)," "Pedestrian Facilities," and "Roundabout Intersection" because they are used in the MUTCD. There were a few editorial comments regarding some of these definitions that the FHWA incorporates in this final rule as appropriate. Also, the FHWA revises the definition of "Inherently Low Emission Vehicle (ILEV)" to clarify that only the U.S. Environmental Protection Agency has the authority to certify ILEVs.

Additionally, the FHWA removes the definition for "Preferential Lane Marking" because it is no longer used in the MUTCD. There were no comments regarding this change.

10. In Section 1A.14 Abbreviations Used on Traffic Control Devices, the FHWA revises the text in the first STANDARD statement to clarify that the abbreviations for the word messages shown in Table 1A-1 are the only abbreviations to be used for those word messages. The FHWA also adds a GUIDANCE statement at the end of this section to give guidance regarding the consistency of abbreviations within a single jurisdiction. Additionally, the FHWA revises Tables 1A-1 and 1A-2 to include additional abbreviations, delete some abbreviations, and modify some abbreviations, based on Texas research on driver understanding of abbreviations. The Illinois DOT was opposed to the abbreviations for northbound, eastbound, and the like, suggesting that the use of "NB", etc. should be allowed. The 2000 Texas Transportation Institute (TTI) study (by Durkop and Dudek)⁵ on which many of

the abbreviation requirements were based found very low driver comprehension rates in Texas for NB, EB, SB, and WB when used as "NB Traffic" or "US 75 NB." The Texas study suggested that a better alternative would be just the initial letter N, S, E, or W. The FHWA reviewed that study and has determined that abbreviations such as "N-BND" would further enhance understanding. Accordingly, the FHWA adopts the changes to this section as proposed in the NPA, with minor editorial clarifications.

Discussion of Adopted Amendments to Part 2—Signs

11. In Section 2A.06 Design of Signs, the FHWA adds to the SUPPORT statement that the "general appearance" of the sign legends, colors and sizes are shown in the illustrations, because the illustrations may not exactly correspond to the letter brush stroke widths of the "Standard Highway Signs" book and the FHWA central values and tolerance limits of colors, due to variations in computer display monitors and printing processes.

In the NPA, the FHWA proposed adding to the STANDARD statement that, unless otherwise stated in the MUTCD for a specific sign, phone numbers or Internet addresses shall not be shown on any sign, to reduce the possibility of driver distraction. While there was one comment from the NCUTCD in support of this change, there were five comments from the Arizona, Washington, Virginia, and Illinois DOTs and the City of Plano, Texas, specifically opposing the language in the NPA prohibiting phone numbers on signs because these may provide important phone numbers that are used for services provided to the public by a government agency. The FHWA agrees that telephone numbers can be useful, but is concerned about driver distraction and the effect on highway safety. To address the

⁴ A list of the American Society for Testing Materials (ASTM) standards is available on the Internet at the following URL: <http://www.astm.org>. The ASTM International is a global forum for the development of consensus standards. Standard ASTM E991-98 is titled "Standard Practice for Color Measurement of Fluorescent Specimens." Standard ASTM E1247-03 is titled "Standard Practice for Detecting Fluorescence in Object-Color Specimens by Spectrophotometry."

⁵ "Texas Driver Understanding of Abbreviations for Dynamic Message Signs", February 2000, by Durkop and Dudek, Texas Transportation Institute Report number FHWA/TX-00-1882-1, can be obtained from the Texas Transportation Institute, phone (979) 845-4853. A summary of the results was also published in Transportation Research Record 1748, available for purchase from the Transportation Research Board at the following