

Product Bulletin

Reflexite® AR 1000 Abrasion-Resistant Delineation Material

The Product

Reflexite AR 1000 is a Type V super high-intensity retroreflective sheeting designed for use on flexible delineator posts, barrier-mounted delineators, and guardrail delineators. The sheeting is composed of cube corner (microprism) retroreflective elements integrally bonded to a flexible, smooth surfaced, tough weather and abrasion resistant UV stabilized polymeric film. The sheeting shall meet the following minimum performance requirements.

Reflectivity

AR 1000 shall comply with the Type V requirements in ASTM D4956-95, sections 7.6 through 7.11. AR 1000 shall meet or exceed the minimum coefficient of retroreflection shown in Table 1. The sheeting shall be measured in accordance with ASTM E 810-94 and rotation angles of 0° and 90°.

TABLE 1
Minimum Coefficients of Reflectivity

Observation Angles	Entrance Angles	White	Yellow	Red
0.1°	-4°	1200	750	180
0.1°	30°	575	400	100
0.2°	-4°	700	470	120
0.2°	+30°	400	270	72
0.5°	-4°	160	110	28
0.5°	+30°	75	51	13

All values have units of cd/lux/m².
The e - 0° orientation angle is determined from the datum mark.

Adhesive

The adhesive is especially formulated to adhere to a variety of surfaces including, but not limited to plastics, fiberglass, aluminum and painted steel. The adhesive is protected by a release liner which shall be removed by peeling, without soaking in water or other solvents. The adhesive produces such a bond that a one- inch-wide strip shall support a 1-3/4 pound weight for 5 minutes without the strip peeling for a distance of more than 2.0 inches when applied to a smooth aluminum panel as specified in the ASTM D 4956 adhesion test.

Impact Resistance

Following application to a smooth-surfaced aluminum rectangle 0.040 inch by 3.0 inch by 6.0 inch, the specimen is conditioned for 24 hours at 72°F and 50% relative humidity. The sheeting shall show no cracking or delamination outside the actual area of impact when the face of the panel is subjected to an impact of a 4.0 pound weight with 5/8 inch rounded tip dropped from a 100 inch-pound setting on a Gardner variable impact tester, IG-1120.

Solvent Resistance

Reflexite AR 1000 meets the requirements of LS-300C solvent resistance, section 3.6.7, when tested as specified in Table VI, test method 4.4.6.

Colors

Reflexite AR 1000 is available in white, yellow and red. The colors conform to the requirements in the following table when tested in accordance with ASTM E1347. See Table 2.

TABLE 2
COLOR SPECIFICATION LIMITS AND REFERENCE STANDARDS

Color	Chromaticity Coordinates*								Reflectance	
	1		2		3		4		Y	
	x	y	x	y	x	y	x	y	Min.	Max.
White	.303	.287	.368	.353	.340	.380	.274	.316	15.0	-----
Yellow	.498	.412	.557	.442	.479	.520	.438	.472	12.0	30.0
Red	.613	.297	.708	.292	.636	.364	.558	.352	2.5	11.0

* The four pairs of chromaticity coordinates determine the acceptable chromaticity on the CIE diagram.

Abrasion Resistance

To duplicate the abrasive environment to which roadside delineators will be subjected in their normal application under the most severe conditions, perform the following procedure and evaluation.

- 3.1 Mask off an area to be tested 50mm x 50mm.
- 3.2 Read and record the coefficient of retroreflection of the test sample as specified at 0.2° observation angle and a -4° entrance angle.
- 3.3 Clamp or hold the sample inside the chamber of a venturi type, bench top sandblaster (Buffalo Dental Manufacturing Company, or equivalent) at a distance of 150 ± 10 mm from the venturi tip, so that the retroreflective face of the sample is perpendicular to the axis of the particle cone and the 50mm x 50mm test area is centered within the particle cone.
- 3.4 Sandblast the unit with medium grit silica sand for 20 seconds with the air pressure at 450 ± 35 kPa (65 ± 5 psi) continuous.
- 3.5 Remove the test unit from the chamber, clean off any abrasive medium, examine surface for damage or color loss, and reread the retroreflectivity as in section 3.2.
- 3.6 The test unit shall retain a minimum of 60 percent of its initial coefficient of retroreflection or 100 percent of the appropriate value from Table 1. The sample shall show no apparent damage or discoloration.

Application

Material should be applied to a smooth, clean, dry surface at temperatures ranging from 50° F to 100°F.

Shrinkage

A 9 inch by 9 inch specimen of the sheeting with liner is conditioned a minimum of 1 hour at 72°F and 50% relative humidity. The liner is then removed and the specimen is placed on a flat surface with the adhesive side up. Ten minutes after the liner is removed and again after 24 hours, the specimen is measured to determine the amount of dimensional change. The specimen will not shrink in any dimension more than 1/32 inch in 10 minutes and 1/8 inch in 24 hours.

Flexibility

The sheeting is conditioned for 24 hours at 72°F and 50% relative humidity. The release liner is removed and the sheeting is sufficiently flexible to show no cracking when bent in one seconds' time around a 1/8 inch diameter mandrel with the adhesive contacting the mandrel.

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