

Product Bulletin

Reflexite® High Performance Roll-up Signs (including Marathon Fluorescence)

The Product

Reflexite High Performance Roll-up Signs are flexible roll-up sign blanks made from reinforced microprismatic retroreflective sheeting. These sign blanks are suitable for fabrication of retroreflective roll-up signs used for construction and maintenance, utility, and incident management applications. All Reflexite roll-up signs are designed to meet the requirements of the Manual on Uniform Traffic Control Devices (MUTCD).

Construction

Reflexite High Performance Roll-up Signs consist of microprismatic retroreflective sheeting bonded to a heavy-duty fiber-reinforced vinyl material. This construction will not delaminate, and provides outstanding durability, legibility, and long sign life.

Microprismatic Sheeting Requirements

Reflexite High Performance Roll-up Signs consist of a high gloss, transparent, UV-stabilized film bonded to a layer of cube corner microprisms. There are roughly 64,000 microprisms per square inch. The sheeting provides high brightness and long-term color and fluorescence retention.

Reflectivity

Reflexite High Performance Roll-up Signs shall have the minimum coefficient of retroreflection shown in Table 1 when tested in accordance with ASTM E 810, "Standard Test Method for Coefficient of Retroreflection of Retroreflective Sheeting".

Daytime Color

Reflexite High Performance Roll-up Signs conform to the daytime color requirements in Table 2 when tested in accordance with ASTM D 4956. Reflexite High Performance Roll-up Signs are available in white, fluorescent yellow-green and fluorescent orange, which utilizes Marathon fluorescence. The four pairs of coordinates determine the acceptable color when measured with standard illuminant D₆₅.

Nighttime Color

Reflexite High Performance Roll-up Signs conform to the nighttime color requirements in Table 3 when tested in accordance with ASTM E 811. The sheeting shall be measured at 0.33° observation angle, 5° entrance angle. The four pairs of coordinates, calculated in the x, y system in accordance with ASTM E 308, determine the acceptable color when measured with standard illuminant A.

Flexibility

Reflexite High Performance Roll-up Signs meet the flexibility requirements of ASTM D4956, Section 6.7. They are sufficiently flexible such that through continuous use, setup and storage, the signs do not show any permanent creasing or delaminating.

Impact Resistance

Ambient Temperature: After conditioning a sample of sealed roll-up sign for 24 hours at 22°C (72°F) and 50% relative humidity, subject the sheeting to an impact of a 1.82 kg (4.0 lb) weight with a 15.8 mm (5/8 in.) rounded tip dropped from a 11.3 N•m (100 in.-lb) setting on a Gardner variable impact tester, IG-1120, as per ASTM D4956. The sheeting shall show no cracking or delamination outside the actual area of impact.

Cold Temperature: After conditioning a sample of sealed roll-up sign for 24 hours at -28.9° ± 3°C (-20 ± 5°F), subject the sheeting to an impact of a 1.82 kg (4.0 lb) weight with a 15.8mm (5/8 in.) rounded tip dropped from a 11.3 N•m (100 in.-lb) setting on a Gardner variable impact tester, IG-1120, as per ASTM D4956. The sheeting shall show no cracking or delamination outside the actual area of impact.

Weatherability

Reflexite High Performance Roll-up Signs meet the requirements of ASTM D4956, Section 6.4. which requires that the material "be weather resistant and show no appreciable cracking, scaling, pitting, blistering, edge lifting, or curling, or more than 0.8mm (0.03125") shrinkage or expansion when tested in accordance with 7.6. Conduct retroreflectivity measurements after outdoor weathering at 0.2° observation and -4° and +30° entrance angles. The minimum coefficient of retroreflection (R_A) after weathering is specified in Table 11."

When tested in a carbon-arc weatherometer in accordance with ASTM D4956 supplemental requirements (S.3) and ASTM Practice G 23, Reflexite High Performance Roll-up Signs will meet or exceed the weathering requirements. Real-time, outdoor weathering data (6 months, south facing) are available from AASHTO/NTPEP (Report 02 NTPEP 215) or from your Reflexite representative. *

* *Fluorescent orange only*

Enhanced Surface Preparation (ESP)

Reflexite® High Performance Roll-up Signs have a unique Enhanced Surface Preparation (ESP), which eliminates the need for a thorough cleaning (e.g. alcohol wipe) prior to screen-printing. It is still good business practice to wipe the surface with a clean, dry tack cloth. Enhanced Surface Preparation allows the use of vinyl graphics using pressure sensitive adhesives. Also, Enhanced Surface Preparation reduces the amount of dust, dirt and other road grime that can stick to Reflexite High Performance Roll-up Signs.

Solvent Resistance

Reflexite High Performance Roll-up Signs will not dissolve, blister, or pucker when wiped with a soft cloth wet with kerosene, mineral spirits, turpentine, VM&P Naphtha, 5% HCL NaOH, or methanol.

Specular Gloss

Reflexite High Performance Roll-up Signs shall have an 85° specular gloss of not less than 40 when tested in accordance with ASTM D 523.

Wrinkle/Crush Resistance

Reflexite High Performance Roll-up Signs shall not exhibit signs of permanent creasing and/or crazing when tested with the following procedure:

The sample shall be conditioned for 24 hours prior to testing at 23° ± 2°C (73° ± 3°F).

Prepare a sample 152mm x 305mm (6" x 12"). Roll the sample, reflective face inward, into a cylinder that is 152mm (6") tall and approximately 63.5mm (2.5") in diameter. Place a rubber band around both ends to maintain the cylindrical shape.

Raise the handle of the compactor to the upright position. Place the sample into the compactor. Pull the handle down with firm, even pressure, until the sample is fully compressed. Raise the handle and remove the compressed sample. Leave the handle in the down position between operations. Unfold the material and inspect the reflective appearance at a distance using a flashlight held at eye level.

Note: The apparatus used for this test is a recycling can crusher and is available at most hardware stores.

This is a proposed standard test method designed to simulate the severe folding, creasing, and other abuse seen in the real world. If such a device is unavailable, rolling the material, folding the cylinder in half, and then creasing the material by stepping/standing on it will produce similar results.

Warranty

3 year limited warranty
Contact your Reflexite representative for details.

TABLE 1
COEFFICIENT OF RETROREFLECTION*
(Candelas/Lux/Square Meter)

Observation Angle	Entrance Angle	White	Fluorescent Yellow-Green	Fluorescent Orange
0.10°	- 4°	750	600	300
0.10°	+ 30°	300	240	120
0.20°	- 4°	500	400	200
0.20°	+ 30°	200	160	80
0.50°	- 4°	225	180	90
0.50°	+ 30°	85	68	34

* Per ASTM D 4956, values for 0.10° observation angles are supplementary requirements that shall apply only when specified by the purchaser in the contract or order.

TABLE 2
DAYTIME COLOR SPECIFICATION LIMITS
Chromaticity Coordinates**

Color	1		2		3		4		Luminance Factor (Y%)	
	x	y	x	y	x	y	x	y	Min.	Max.
White	0.303	0.300	0.368	0.366	0.340	0.393	0.274	0.329	27	---
Fluorescent Yellow-Green	0.387	0.610	0.369	0.546	0.428	0.496	0.460	0.540	60	---
Fluorescent Orange	0.583	0.416	0.535	0.400	0.595	0.351	0.645	0.355	25	---

** The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE 1931 Standard Colorimetric System measured with CIE Standard Illuminant D₆₅.

TABLE 3
NIGHTTIME COLOR SPECIFICATION LIMITS
Chromaticity Coordinates***

Color	1		2		3		4	
	x	y	x	y	x	y	x	y
White	0.475	0.452	0.360	0.415	0.392	0.370	0.515	0.409
Fluorescent Yellow-Green	0.480	0.520	0.473	0.490	0.523	0.440	0.550	0.449
Fluorescent Orange	0.625	0.375	0.589	0.376	0.636	0.330	0.669	0.331

*** The four pairs of chromaticity coordinates determine the acceptable color in terms of the CIE 1931 Standard Colorimetric System measured with CIE Standard Illuminant A.

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