

Traffic Safety and Security Division

3M™ Stamark™ High Performance All Weather Tape

Series 380AW

Product Bulletin 380AW
September 2016

Replaces PB 380AW dated January 2009

Description

3M™ Stamark™ High Performance All Weather Tape Series 380AW is a durable pavement marking tape that is highly retroreflective under both wet and dry conditions. Stamark Series 380AW tape utilizes specially designed optics to provide wet and dry performance. Stamark Series 380AW tape can be used as an inlay marking on new asphalt or as an overlay marking on most asphalt and concrete pavement surfaces in good condition.

Series A380AW: Used for lane lines, edge lines, channelizing lines, and gore markings.

Series L380AW: With liner. Used to cut symbols and legends.

SMS L380AW: With liner. Precut symbols and legends.

Properties

Product Features

- High retroreflective performance, wet or dry.
- Durable, conformable, and retroreflective.
- New product design that provides long-term reflectivity.
- Abrasion-resistant microcrystalline ceramic beads bonded in a highly durable polyurethane topcoat.
- Manufactured with no (intentional) use of heavy metals, lead chromate pigments or other similar, lead-containing chemicals.
- Improved patterned surface that presents a near vertical surface to traffic to maximize retroreflectance.
- Precoated with an extended season pressure sensitive adhesive (PSA) on bottom surface.
- Nominal thickness of 0.080 in. (2 mm) at pattern heights.
- White: 380AW.

- Yellow microcrystalline ceramic beads incorporated in 381AW tape to improve nighttime yellow color.
- Yellow: 381AW.

Retroreflectivity

3M™ Stamark™ Series 380AW has the following initial minimum coefficients of retroreflected luminance (R_L) under wet and dry conditions. Coefficients are measured under dry conditions in accordance with the testing procedures of ASTM E1710. Coefficients are measured under wet conditions in accordance with ASTM E2832-12 or ASTM E2177 using a portable reflectometer.

Table 1. 380AW & 381AW Minimum Retroreflectivity Values

Color	White (380AW)		Yellow (381AW)	
	Dry ASTM E1710	Wet & Rainy ASTM E2832-12	Dry ASTM E1710	Wet & Rainy ASTM E2832-12
Entrance Angle ¹	88.76°	88.76°	88.76°	88.76°
Observation Angle ¹	1.05°	1.05°	1.05°	1.05°
Coefficient of Retroreflected Luminance [mcd/m ² /lux]	500	250	300	200

Note: 380AW and 381AW coefficients of retroreflected luminance when measured under ASTM E2177 will be higher than when measured under ASTM E2832-12. Stated minimum values shall be met using either test method.

English R_L : Millicandelas per square foot per foot-candle [(mcd/ft²)/fc]

Metric R_L : Millicandelas per square meter per lux [(mcd/m²)/lx]

Initial wet retroreflectance values must be measured in accordance with ASTM E2832-12 or ASTM E2177 prior to installation. Wet retroreflectance values measured under a “condition of continuous wetting” (simulated rain) shall be in accordance with ASTM E2832-12. Wet retroreflectance values measured under a “condition of wetness” (wet recovery) shall be in accordance with ASTM E2177. To reduce variability between measurements, the test method shall be performed in a controlled laboratory environment to reduce variability while the marking is positioned per ASTM E2832-12. Since new marking surfaces are hydrophobic, a wetting agent shall be used to improve the wetting of the pavement marking. A good wetting agent is a 0.1% by volume liquid soap solution. Measurements shall be reported as an average for each roll tested, in a minimum of three locations.

Color

The preformed markings conform to ASTM D6228, Standard Specification for Color of Pavement Marking Materials.

Skid Resistance

The patterned surface of the retroreflective pliant polymer shall provide an initial average skid resistance value of 45 BPN when tested according to ASTM E303 except values will be taken in one direction and at a 45° angle from that direction. These two values will then be averaged to find the skid resistance of the patterned surface.

Application

All applications should be installed using the instructions in the appropriate section of [3M Information Folder 5.7](#).

Patchability

Heavy traffic and snow plowing may cause wear and damage. New materials can be installed in these areas. Remove the damaged material and replace the damaged area by following the instructions in the “Overlay Applications” section of [3M Information Folder 5.7](#).

¹ Entrance Angle 88.76° and Observation Angle 1.05° represent a simulated driver viewing geometry at a 30 meter distance.

General Performance Considerations

Stamark™ pavement marking tapes are weather resistant and provide excellent reflectivity and color retention. Experience has shown that these materials are highly effective traffic control devices and will show no appreciable fading, lifting, shrinkage or chipping when applied according to 3M's requirements contained in product literature for the warranty period.

The durability of Stamark pavement markings depends on multiple environmental traffic conditions, including but not limited to snow removal practices, application techniques used, and pavement and atmospheric conditions at the time of application. It is recommended that the customer thoroughly evaluate Stamark tapes under the conditions in the specified location before making large-scale applications.

3M™ Warranty

3M warrants that ("3M Warranty"), under normal traffic conditions, Stamark™ High Performance All Weather Tape Series 380AW ("Tape") sold by 3M for pavement marking applications will meet the minimum retained coefficient of retroreflected luminance (R_L) of 100 mcd/m²/lux (under dry conditions in accordance with ASTM E1710), and will remain visible subject to the provisions in Table 2.

Table 2. Warranty Periods

Application	Warranty Period
Longitudinal Markings	4 years
Symbols and Legends	2 years

Terms and Conditions

- If Tape is installed in grooves, the depth of the groove shall be between 150 mils – 200 mils, grooved with a large diameter cutting head with gang-stacked diamond cutting blades resulting in a flat (smooth) groove surface, following the application requirements in [3M Information Folder 5.18](#).
- Coefficient of retroreflected luminance (R_L) shall be determined at 1.05° observation and 88.76° entrance angle according to ASTM E1710, as per the sampling and testing procedures outlined herein. Equipment used in measurements shall be in good calibrated order according to the calibration schedule as recommended by the equipment manufacturer at the time of measurements. 3M may use an additional calibrated instrument or request a calibrated referee instrument to validate measurements. Tape must be shown to not meet the 3M Warranty when measured according to all of the ASTM test methods and standards listed above to qualify for the 3M Warranty.
- Tape and other 3M components involved in the 3M Warranty must be stored, applied, installed, processed, and used in accordance with all 3M application procedures found in 3M's product bulletins, information folders, manufacturing manuals, and technical memos (which will be furnished upon request).
- Tape shall be applied with the 3M-recommended surface preparation adhesive if the installation conditions warrant its use as per [3M Information Folder 5.7](#).
- A failure to meet the 3M Warranty must be solely the result of design or manufacturing defects and not of (a) outside causes including improper fabrication, improper application, handling, maintenance or installation; (b) substrate failure, exposure to chemicals, burial, abrasion or other mechanical damage, improper use, vandalism, malicious mischief; (c) or an act of God.
- 3M reserves the right to determine the type of replacement marking and method of installation.
- Claims made under this warranty will be honored only if the customer has maintained an accurate record of Installation Date, which constitutes the start of the Warranty Period. Claims under this warranty will be honored only if 3M is notified in writing of a failure within one month of discovering such failure, reasonable information requested by 3M is provided, and 3M is permitted to verify the cause of the failure.
- Applications in mountainous, heavy snowfall areas above 5,000 ft. (1,500 m) are not covered under this warranty.

- Damage to pavement markings caused by snow removal equipment is not covered under this warranty.

Exclusive Limited Remedy

If a Tape is shown to not meet the 3M™ Warranty, 3M’s sole responsibility and purchaser’s and user’s exclusive remedy shall be: 3M will provide the replacement materials that will restore the pavement marking retroreflectivity values to warranty levels or greater for the unexpired term of the warranty.

Disclaimer

THE 3M WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE, OR ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING OR OF PERFORMANCE, CUSTOM OR USAGE OF TRADE.

Limitation of Liability

Except for the limited remedy stated above, and except where prohibited by law, 3M will not be liable for any loss or damage arising from the Tape or any 3M product, whether direct, indirect, special, incidental or consequential damages (including but not limited to lost profits, business or revenue in any way), regardless of the legal theory asserted including warranty, contract, negligence or strict liability.

Sampling and Testing Procedure for Determining Initial and Retained Coefficients of Retroreflected Luminance for 3M Warranty Purposes

Step 1: A visual night inspection must be made with a 3M representative and a customer representative present to identify areas of interest which appear to be below the specified minimum retained reflectance values. Areas of interest which appear to be below the minimum retained reflectance value shall be identified as potential zones of investigation (“Zone of Investigation”). To qualify for a warranty claim, a Zone of Investigation must be at least 360 feet (108 meters) in road length, and shall consist of either edge lines, center lines or lane lines, but not in combination.

Step 2: Within each Zone of Investigation, reflectance measurements must be taken at specified measurement sections. The measurement procedure varies based on the total length of the Zone of Investigation, as described below.

A. Zone of Investigation Measuring 360 Feet (108 m) to 1,080 Feet (324 m) in Length

For continuous lines, reflectance measurements must be made at approximately 20 ft. (6 m) intervals throughout the Zone of Investigation. For skip lines, two measurements must be taken at two random locations on each skip throughout the Zone of Investigation.

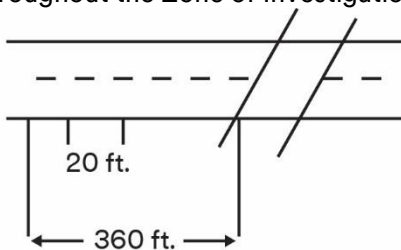


Figure 1.

B. Zone of Investigation Measuring 1,080 Feet (324 m) to 6 Miles (9.6 km) in Road Length

A minimum of three measurement sections must be specified within the Zone of Investigation. Each measurement section must be at least 360 ft in road length. The start point, the midpoint and the end point of the Zone of Investigation must be included in a measurement section, as shown in Figure 2. A minimum of 18 measurements must be made at each measurement section. For continuous lines, reflectance measurements must be made at 20-foot (6 m) intervals throughout each measurement section. For skip lines, two measurements must be taken at two random locations on each skip in the measurement sections.

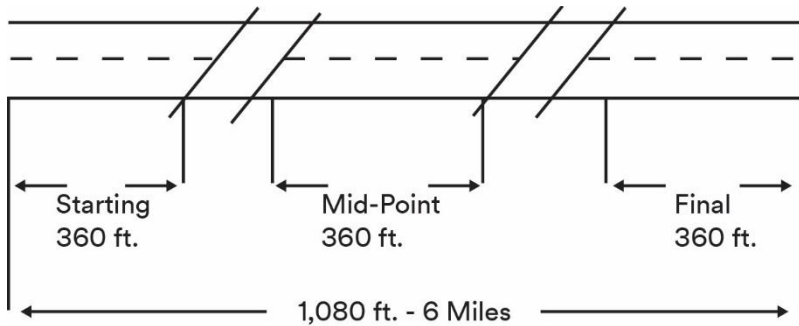


Figure 2: Measure every 20 ft. on continuous lines or 2 measurements per skip for each measurement section.

C. Zone of Investigation Greater than 6 Miles in Road Length

Each 3-mile (4.8 kilometers) interval throughout the Zone of Investigation must include at least one measurement section. In each measurement section, a minimum of 18 measurements must be made. The start point and the end point of the Zone of Investigation must be a part of a measurement section. For continuous lines, reflectance measurements must be made at 20-foot (6 m) intervals throughout each measurement section. For skip lines, two measurements must be taken at two random locations on each skip in the measurement sections.

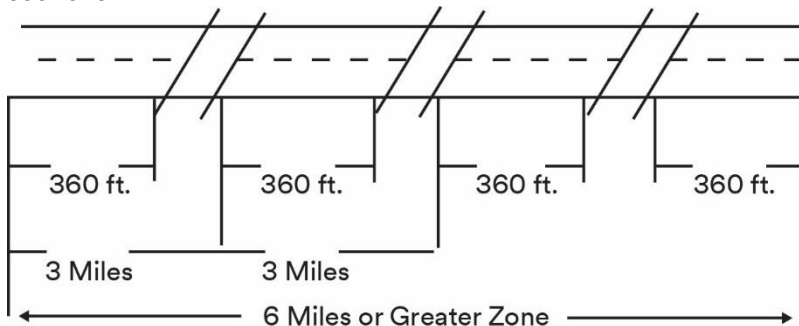


Figure 3: Measure every 20 ft. on continuous lines or 2 measurements per skip for each measurement section.

Step 3: All reflectance measurements made at the checkpoints shall be made on a clean, dry surface at a minimum temperature of 40° F (4° C). The test instrument shall use an Entrance Angle of 88.76° and an Observation Angle 1.05° which represent a simulated driver viewing geometry at a 30 meter distance.

Step 4: All reflectance measurements within the Zone of Investigation must be averaged to determine if the minimum retained retroreflectance values have been met.

Materials Replacement Condition

Markings must be applied according to the instructions in [3M™ Information Folder 5.7](#) to qualify for any applicable materials replacement provisions.

Health and Safety Information

Read all health hazard, precautionary and first aid statements found in the Safety Data Sheets, Article Information Sheets, and/or product label of chemicals prior to handling or use. Consult local regulations and authorities for possible restrictions. To obtain SDS sheets for 3M products, go to 3M.com/SDS, or by mail, or for more information, call 1-800-3MHELPS (1-800-364-3577).

Storage

Store in a cool, dry area indoors. Use within one year of receipt.

Literature Reference

For additional information on Stamark™ Tapes, application instructions or application equipment, refer to the following publications:

[IF 5.2](#) Information Folder for 3M™ Highway Tape Applicator - HTA

[IF 5.7](#) Pavement Surface Preparation and Application Procedures for 3M™ Stamark™ Pavement Marking Tapes

[IF 5.8](#) Application of 3M™ Stamark™ Precut Symbols and Legends

[IF 5.18](#) Grooving Applications

ASTM Test Methods are available from ASTM International, West Conshohocken, PA.

For Information or Assistance

Call: 1-800-553-1380

In Canada Call:

1-800-265-1840

Internet:

www.3M.com/roadwaysafety

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