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Commercial Branding and Transportation Division

3M™ Stamark™ High Performance Contrast Marking Tape Series 380IES-5

Product Bulletin Series 380IES-5
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Replaces Product Bulletin 380IES-5 Dated June 2020

1 Description

3M™ Stamark™ High Performance Contrast Marking Tape Series 380IES-5 (“Tape”) is a durable pavement contrast marking tape that can be used as an inlay marking in snowplow areas when recessed into grooves in new asphalt and concrete surfaces, or as an overlay marking on most asphalt and concrete pavement surfaces in good condition. The Tape incorporates a matte black film border, bonded to the edges of the central retroreflective film to provide contrast.

The Tape enables “Extended Season” applications due to the incorporation of an improved pressure sensitive adhesive (“PSA”) package on its bottom surface. When applied during the standard application season, as defined in the 3M Stamark Pavement Markings Tapes Climate Guide, Tape does not require the use of a 3M Stamark surface preparation adhesive.

1.1 Product Features

- Durable, conformable to pavement, and retroreflective
- 1.5” wide matte black preformed patterned film border on both sides of white or yellow film
- Embedded net provides increased tear resistance
- PSA on bottom surface
- No surface preparation adhesive required when applied within standard tape application season as defined by the 3M Stamark Pavement Markings Tapes Climate Guide
- Can be applied early and late season, down to 40 °F (4 °C), when a 3M Stamark surface preparation adhesive is used
- Long-term reflectivity
- Abrasion-resistant zirconia-enriched beads bonded in a highly durable polyurethane topcoat
- Yellow zirconia-enriched beads incorporated in 381 I-5ES Tape improve nighttime yellow color
- Manufactured without the intentional use of heavy metals, lead chromate pigments, or other similar, lead-containing chemicals
- Patterned design presents a near vertical surface to traffic to maximize retroreflectance
- Nominal total thickness of 0.090 in. (2.3 mm)
- White: 380I-5ES
- Yellow: 381I-5ES

2 Specifications

2.1 Retroreflectivity

Table 1 presents minimum initial coefficient of retroreflected luminance (R_L) values for white and yellow Tape, when measured under dry conditions in accordance to ASTM E1710. R_L values are expressed in millicandelas per square foot per footcandle [(mcd • ft^{-2}) • fc^{-1}].

Table 1. Minimum initial dry R_L values for white and yellow Tape.

	White (380IES-5)	Yellow (381IES-5)
Entrance Angle	88.76°	88.76°
Observation Angle	1.05°	1.05°
Retroreflected Luminance[a] R_L [(mcd • ft^{-2}) • fc^{-1}]	500	300

a. The quantity of retroreflected luminance (R_L) “relates to the way the effective retroreflective surface is focused on the retina of the human eye and to the visual effect thereby produced. It is recommended for describing the performance of highway signs and striping, or large vehicular markings which are commonly viewed as discernible surface areas.” Federal Test Method Standard 370, 3.1.2, Note 6, March 1, 1977.

2.2 Color

The daytime and nighttime colors of Tape conform to ASTM D6628, the Standard Specification for Color of Pavement Marking Materials.

2.3 Skid Resistance

The surface of the Tape provides an initial average skid resistance value of 45 BPN when tested according to the procedure of ASTM E303, subject to the following modification:

- Skid resistance is calculated as the average of two measurements taken at an angle of 45° from one another.

2.4 Patchability

Snow removal equipment and heavy traffic may cause wear and damage to Tape. Such damaged areas can be repaired using patches made of Tape. Remove damaged Tape and replace it according to the instructions presented in the “Overlay Applications” section of 3M Information Folder 5.7.

3 Application

Tape should be installed according to the instructions presented in the appropriate section of 3M Information Folder 5.7.

4 Durability

Tape is weather resistant and provides excellent reflectivity and color retention. Tape is a highly effective lane marking material and will show no appreciable fading, lifting, shrinkage, or chipping for the duration of the warranty period, when applied according to 3M's requirements contained in product literature.

The durability of Tape depends on several environmental and 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 Tape under the conditions present at the installation location prior to large-scale implementation.

5 Storage

Use within two years of manufacturing date, when stored indoors in a cool dry area.

6 Health and Safety Information

Read all health hazard, precautionary, and first aid statements found in the Safety Data Sheets (SDS) and Article Information Sheets for important health, safety, and environmental information. To obtain SDSs and Article Information Sheets for 3M products, go to 3M.com/SDS, contact 3M by mail, or for urgent requests call 1-800-364-3577.

7 Warranty Information

7.1 3M Warranty

3M warrants (“3M Warranty”) that, under normal traffic conditions, Tape used in longitudinal pavement marking applications, will retain a minimum coefficient of retroreflected luminance (R_L) of 100 mcd/m^2/lux (under dry conditions in accordance with ASTM E1710) and remain visible, for a period of four (4) years (“Warranty Period”), as measured from the date of installation (“Installation Date”), subject to the following provisions:

Table 2. Warranty period according to application type.

Application	Warranty Period
Longitudinal markings	4 years
Symbols and legends	2 years

7.2 3M Warranty Terms and Conditions

- If Tape is installed in grooves, the depths of the grooves shall be between 150 and 200 mils. Grooves shall be made with a large diameter cutting head with gang-stacked diamond cutting blades to produce a flat (smooth) groove surface, following the Stamark pavement marking tape application requirements described in 3M Information Folder 5.18.
- Loss of adhesion is not covered by the 3M Warranty when Tape is applied to surfaces that have been finished using anything other than a gang-stacked diamond cutting head.
- Coefficient of retroreflected luminance (R_L) shall be determined at 1.05° observation and 88.76° entrance angles 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 recommended by the equipment manufacturer, at the time of measurement. 3M may use an additional calibrated instrument or request a calibrated referee instrument to validate measurements.
- 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-required surface preparation adhesive if the installation conditions warrant its use, as per the Stamark pavement marking tape installation instructions in 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, or malicious mischief; or (c) 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 (a) the customer has maintained an accurate record of Installation Date, which constitutes the start of the Warranty Period; (b) 3M is notified in writing of a failure within one month of its discovery; (c) reasonable information requested by 3M is provided; and (d) 3M is permitted to verify the cause of the alleged failure.
- Applications in mountainous, heavy snowfall areas above 5,000 ft. (1,500 m) are not covered under the 3M Warranty.
- Damage to pavement markings caused by snow removal equipment is not covered under the 3M warranty.
- Tape must be shown not to meet the 3M Warranty when measured according to the appropriate ASTM test method, using the sampling procedure described below, to qualify for remedy under the 3M Warranty.

7.3 Exclusive Limited Remedy

If Tape is shown not to 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 original Warranty Period.

7.4 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 installation which appear to be below the specified minimum retained reflectance values.

Areas which appear to be below the minimum retained reflectance value shall be identified as potential zones of replacement (“Zone of Replacement”). To qualify for replacement, a zone 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, reflectance measurements must be taken at specified measurement sections. The measurement procedure varies based on the total length of the Zone of Replacement, as described below.

a **Zone of Replacement 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 Replacement. For skip lines, two measurements must be taken at two random locations on each skip throughout the Zone of Replacement.

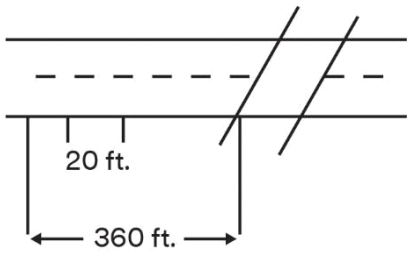

Figure 1. Measure every 20 ft. on continuous lines or 2 measurements per skip for each measurement section.

b **Zone of Replacement 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 Replacement. 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 Replacement must be included in respective measurement sections as shown in Figure 2. A minimum of 18 measurements must be made at each of three measurement sections within the Zone of Replacement. For continuous lines, reflectance measurements must be made at 20 ft. (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.

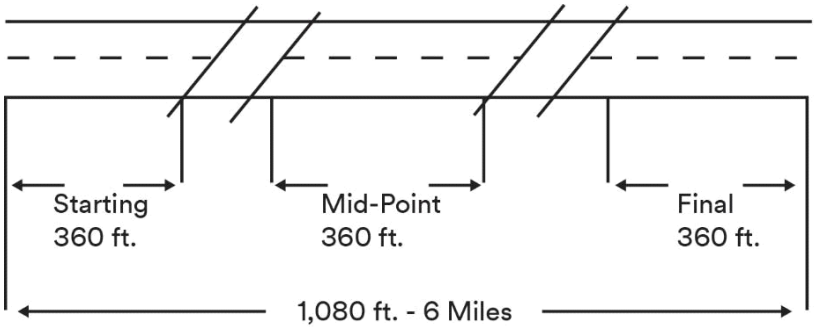

Figure 2. Measure every 20 ft. on continuous lines or 2 measurements per skip for each measurement section.

c **Zone of Replacement Greater than 6 Miles in Road Length**

A minimum of 18 measurements must be made in each measurement section within the Zone of Replacement. The start point and the end point must be a part of a measurement section. Each 3-mile (4.8 kilometers) interval throughout the Zone of Replacement must include at least one measurement section. For continuous lines, reflectance measurements must be made at 20 ft. (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.

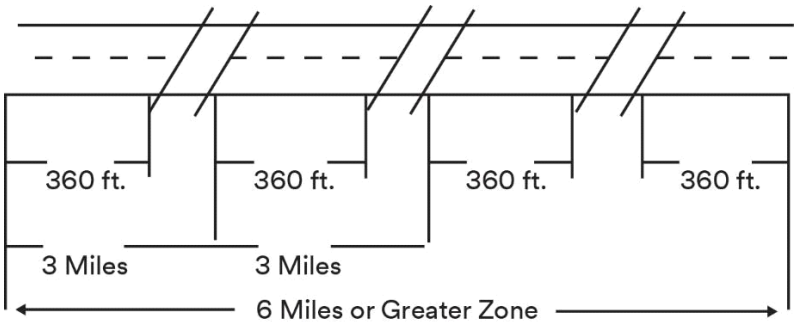

Figure 3. Measure every 20 ft. on continuous lines or 2 measurements per skip for each measurement section.

Step 3: All reflectance measurements made at checkpoints shall be made on clean, dry surfaces with 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 Replacement must be averaged to determine if the minimum retained retroreflectance values have been met.

7.5 Materials Replacement Condition

Tape must be applied according to the Stamark pavement marking tape installation instructions in 3M Information Folder 5.7 to qualify for any applicable materials replacement provisions.

7.6 Disclaimer

THE 3M WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES OR CONDITIONS, 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.

7.7 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.

8 Other Product Information

Always confirm that you have the most current version of the applicable product bulletin, information folder, or other product information from 3M's Website at http://www.3M.com/roadsafety.

9 Literature References

3M IF 5.2 Highway Tape Applicator (HTA)
3M IF 5.7 3M™ Stamark™ Tapes Pavement Surface Preparation and Application Techniques
3M IF 5.18 Application Guidelines for Pavement Markings in Grooved Pavement Surfaces
3M™ Stamark™ Pavement Markings Tapes Climate Guide

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

For Information or Assistance
Call: 1-800-553-1380
In Canada Call:
1-800-3M HELPS (1-800-364-3577)

Internet:
http://www.3M.com/roadsafety

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Commercial Branding and Transportation
3M Center, Building 0225-04-N-14 St.
Paul, MN 55144-1000 USA

Phone 1-800-553-1380
Web 3M.com/roadsafety