Description

3M™ Stamark™ Wet Reflective Removable Tape Series 710 is highly reflective under both wet and dry conditions. Series 710 tape is a conformable marking tape intended for longitudinal line applications in highway work zones where removability is required. The tape is designed to perform for the duration of the normal construction season. After the pavement markings are no longer required, the tape can be manually removed intact or in large pieces. Series 710 is also supplied as pre-cut symbols and legends for work zone applications.

Series 710 tape utilizes specially designed optics to provide dry and wet reflective performance. It is comprised of white or yellow film supported by a flexible, conformable backing. The tape is reinforced by a structured medium and pre-coated with a pressure sensitive adhesive (PSA) for easy, rapid application in temperatures above 50°F (10°C).

1. **A normal construction season is defined as the time after the last snow plowing in the spring and before the first snow plowing in the fall/winter. In locations where snow removal is not performed Series 710 tape is intended for use up to one year. Series 710 tape is a temporary removable product not intended for multi-year applications.**

Properties

A. Product Features and Advantages

- Highly reflective, wet or dry.
- Durable during normal work zone season as defined above.
- Skid resistant.
- Coated with pressure sensitive adhesive (PSA).
- Tape available in white and yellow.
- Symbols and legends available in white only.
- Provides continuous delineation, day or night.
- Easy to apply by hand or by machine.
- Easy to remove intact or in large pieces.
- Leaves no lasting marks.
- Roadway may be opened to traffic immediately.

B. Reflectance

Stamark Series 710 has the following initial minimum retroreflectance values under wet and dry conditions. Values are measured under dry conditions in accordance with the testing procedures of ASTM D4061. Retroreflectance values are measured under wet conditions in accordance with ASTM E2176 or ASTM E2177 using a portable reflectometer.

Wet retroreflectance values measured under a “condition of continuous wetting” (simulated rain) will be in accordance with the testing procedure of ASTM E2176. To reduce variability between measurements, test method is to be performed in a controlled laboratory environment while the marking is positioned with a 3 to 5 degree lateral slope. A wetting agent is used to improve wetting of the pavement marking by the water. It is recommended that a 0.1% by volume liquid soap solution be used. Measurements are reported as an average for each roll tested, in a minimum of three locations.

Wet reflective values measured under a “condition of wetness” (simulated rain) will be in accordance with the testing procedure of ASTM E2177. The photometric quality to be measured is coefficient of retroreflected luminance (R). The test may be performed with the marking installed on the road. New markings are tested using a wetting agent, as previously described. Laboratory measurements are performed using a 3 to 5 degree lateral slope. Measurements are reported as an average for each roll tested, in a minimum of three locations.
Table 1.
710 Minimum Retroreflectivity Values

<table>
<thead>
<tr>
<th></th>
<th>White</th>
<th>DRY</th>
<th>WET &amp; RAINY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrance Angle</td>
<td>88.76°</td>
<td>88.76°</td>
<td></td>
</tr>
<tr>
<td>Observation Angle</td>
<td>1.05°</td>
<td>1.05°</td>
<td></td>
</tr>
<tr>
<td>Retroreflected Luminance</td>
<td>500</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>R_l [(mcd • m⁻²) • lx⁻¹]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.
711 Minimum Retroreflectivity Values

<table>
<thead>
<tr>
<th></th>
<th>Yellow</th>
<th>DRY</th>
<th>WET &amp; RAINY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrance Angle</td>
<td>88.76°</td>
<td>88.76°</td>
<td></td>
</tr>
<tr>
<td>Observation Angle</td>
<td>1.05°</td>
<td>1.05°</td>
<td></td>
</tr>
<tr>
<td>Retroreflected Luminance</td>
<td>300</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>R_l [(mcd • m⁻²) • lx⁻¹]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: 710 wet retroreflectance values when measured under a "condition of wetness" will be higher than when measured under a "condition of continuous wetting." Stated minimum values shall be met using either test method.

English R_l: Millicandels per square foot per foot-candle [(mcd • ft⁻²) • fc⁻¹]
Metric R_l: Millicandels per square meter per lux [(mcd • m⁻²) • lx⁻¹]

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

C. Color
The preformed markings consist of white or yellow.

D. Skid Resistance
The surface of the Series 710 tape provides a minimum initial average skid resistance value of 45 BPN when tested according to ASTM E 303.

E. Application
All applications of Series 710 tapes should be installed using the instructions in this Product Bulletin and the appropriate section of 3M Information Folder 3.2 and the 3M Road Surface Guide for suitability of application. The newly marked area can be opened to traffic immediately following application.

Surface Preparation Adhesive is not needed when applying the tape under normal conditions as outlined under the General Application Conditions section of this bulletin. Under marginal weather conditions, 3M™ Stamark™ Surface Preparation Adhesive P-50 can be used to improve initial and long term adhesion. For long line applications, the P-50 Surface Preparation Adhesive should be applied with a 3M™ Adhesive Spray Applicator PS-14. For symbols and legends, the Surface Preparation Adhesive should be applied using a 3/8" nap paint roller.

General Application Conditions:
- Air and pavement temperature minimums for Series 710 tape are 50°F (10°C) and rising.
- Pavement surface must be clean and dry.
- Butt splices must be used. Do not overlap tape ends.
- Do not apply tape on longitudinal seams or joints.
- In areas of high traffic encroachment or on rough, exposed aggregate surfaces, service life may be limited, for example: tined Portland cement or open graded ACC. In this situation it is recommended that the tape be inspected for replacement on a two-month cycle.
- Stamark P-50 surface preparation adhesive is used to improve initial and long term adhesion when applying Stamark removable pavement marking tapes during marginal weather conditions or to poor substrates that may not allow Stamark tapes to adhere well to the road surface. P-50 can be applied to existing asphalt or portland cement concrete surfaces. The air and pavement temperature must continue to be 50°F (10°C) and rising at the time of application. Marginal weather conditions can include circumstances where:
  - The air and pavement temperatures will not exceed the minimum application temperature for the next 24 to 48 hours after installation.
  - Prolonged or heavy rainfall following tape application is predicted.
  - Application is to occur in early spring or late fall beyond typical road construction season.

F. Removability
The tape is removable from asphalt and smooth Portland cement concrete surfaces intact or in large pieces at temperatures above 32°F (0°C) without the use of heat, solvents, grinding, or sandblasting. Use the following procedure:
1. Wear gloves and use a chisel-like tool to pry up the edge of the tape.
2. Pull straight up at a 90° angle to the pavement.
3. A small amount of heat may be used to help soften the adhesive when removing Stamark tape during cold weather conditions.

Note: Burning or grinding is not recommended.
Removal and replacement during the normal construction season as defined in the Description section may be required in areas of high encroachment.
or on rough exposed aggregate surfaces using mechanical methods such as high pressure water blasting. User is responsible for determining suitability of product.

**Storage**
Stamark tapes should be stored in a cool, dry indoor area and used within one year of receipt.

**Health and Safety Information**
Read all health hazard, precautionary, and first aid statements found in the Material Safety Data Sheet (MSDS), and/or product label of chemicals prior to handling or use. When using a pavement preparation adhesive with this product, refer to the appropriate MSDS for information about the volatile organic compound (VOC) content of the adhesive. Consult local regulations and authorities for possible restrictions on product VOC content and/or VOC emissions. Electronically, visit us at www.3M.com/us and select MSDS search.

**General Performance Considerations**
3M™ Stamark™ Wet Reflective Removable Tape Series 710 is designed to provide excellent reflectivity under both wet and dry conditions. Actual performance will be dependent on pavement and atmospheric conditions at the time of application, application method, traffic and exposure conditions.
The user should test for conformance to their requirements before making large scale applications.

3M makes no generalized effective performance claims or material replacement provisions. Abrasion or heavy wear may significantly reduce expected effective performance. Our experience has shown that properly installed Series 710 tape is a highly effective traffic control device.

**Literature Reference**
IF 3.2 Pavement Surface Preparation and Application Procedures for 3M™ Stamark™ Temporary Pavement Marking Tapes.
IF 5.2 3M™ Highway Tape Applicator (HTA).
3M Road Surface Guide.

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