



# Stamark™ Pavement Marking Tape

## Series 270 ES

Product Bulletin 270 ES

May 2011

### Description

3M™ Stamark™ Pavement Marking Tape Series 270 ES is a retroreflective patterned polymer pavement marking that can be used as an inlay marking on new asphalt or as an overlay marking on asphalt and concrete pavement surfaces in good condition.

Series 270 ES tape offers “Extended Season” applications due to an improved pressure sensitive adhesive (PSA) package on the bottom surface.

Series 270 ES does not require 3M™ Stamark™ Surface Preparation Adhesive P-50 or 3M™ Stamark™ Low VOC Surface Preparation Adhesive SPA60 prior to application, if applied during the application season as outlined in the 3M Climate Guide for 3M™ Stamark™ Pavement Marking Tapes.

**Series A270 ES:** Unlined. Used for long lines, edge lines, channelizing lines, gore markings, stop bars and crosswalks.

**Series L270 ES:** Lined. Used to cut symbols and legends.

**Series SMS-L270 ES:** Lined. Precut symbols and legends.

### Properties

#### A. Product Features

- Durable, conformable to pavement and retroreflective
- Embedded net provides increased tear resistance
- Pressure sensitive adhesive (PSA) on bottom surface
- No surface preparation adhesive required when applied within standard tape application season as by the 3M Climate Guide
- Can be applied early and late season, down to 40°F (4°C) with use of 3M™ Stamark™ Surface Preparation Adhesive P-50 or 3M™ Stamark™ Low VOC Surface Preparation Adhesive SPA60
- Retroreflective layer of glass beads bonded in a highly durable polyurethane topcoat

- Manufactured without the use of heavy metals, lead chromate pigments or other similar, lead containing chemicals
- Nominal thickness of 0.065 in. (1.6 mm) at pattern heights
- White: 270 ES
- Yellow: 271 ES

#### B. Reflectance

Series 270 ES tape has the following initial minimum retroreflectance values when measured in accordance with ASTM-D4061 and ASTM 4505. The photometric quality to be measured is coefficient of retroreflected luminance ( $R_L$ ) and shall be expressed as:

**English  $R_L$ :** millicandelas per square foot per footcandle [ $(\text{mcd} \cdot \text{ft}^{-2}) \cdot \text{fc}^{-1}$ ] or equivalently as:

**Metric  $R_L$ :** millicandelas per square meter per lux [ $(\text{mcd} \cdot \text{m}^{-2}) \cdot \text{lx}^{-1}$ ]

	White	Yellow
Entrance Angle	88.76°	88.76°
Observation Angle	1.05°	1.05°
Retroreflected Luminance*	300	250

$R_L$  [ $(\text{mcd} \cdot \text{ft}^{-2}) \cdot \text{fc}^{-1}$ ]

\*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.



### C. Color

The preformed markings consist of white or yellow films with pigments selected and blended to conform to standard highway colors.

### D. Skid Resistance

The patterned surface of the retroreflective pliant polymer shall provide an initial minimum skid resistance value of 45 BPN when tested according to ASTM E 303 except values will be taken in one direction and at 45° angle from that direction. These two values will then be averaged to find the skid resistance of the patterned surface.

### E. Application

All applications should be installed using the instructions in the appropriate section of 3M Information Folder 270 ES. Surface preparation adhesive is not needed when applying the tape during the application season outlined in the 3M Climate Guide for 3M™ Stamark™ Pavement Marking Tapes. The tape can be applied down to 40°F (4°C) ambient temperature outside the dates outlined in the Climate Guide for Stamark pavement marking tapes with the use of 3M™ Stamark™ Surface Preparation Adhesive P-50 or 3M™ Stamark™ Low VOC Surface Preparation Adhesive SPA60. For long line applications, the P-50 or SPA60 surface preparation adhesive should be applied with a 3M™ Adhesive Spray Applicator PS-14. For transverse markings, the surface preparation adhesive should be applied using a solvent resistant 3/8 inch nap paint roller.

Road lanes are typically exposed to different levels of traffic shear exposure. Road lanes that are exposed to a high frequency of high shear turning, especially by trucks and other large vehicles, require use of SPA60 or P50 for application of Stamark pavement marking tapes. The following table summarized the product and surface preparation adhesive application recommendations by shear condition:

Contact 3M Technical Service at 1800-553-1380 for questions.

Shear Level	Product and Adhesive Recommendation
Very High Shear	Stamark Tape Use SPA60
High Shear	Stamark Tape "A" and "L" Series Use SPA60
Pounds per 100 sq ft	Stamark Tape "A" and "L" Series Use P50 or SPA60
Low Shear	Stamark Tape "A" and "L" Series

Within the Climate Guide Recommendations

### F. Patchability

Heavy traffic and snow plowing may cause wear and damage. New materials can be installed in these areas with minimal surface preparation by following

the manufacturer's recommendations. Remove the damaged material and replace the damaged area by following the instructions in "Overlay Applications" of 3M Information Folder 270 ES.

### General Performance Considerations

Stamark pavement marking tapes are highly effective traffic control devices when properly applied according to 3M recommendations provided in product bulletins and information folders.

The durability of Series 270 ES tape will depend on traffic conditions, snow removal practices, application techniques used, and pavement and atmospheric conditions at the time of application. Damage will be caused by heavy trucks, excessive encroachment (crossover) on high ADT roadways, narrow lane width, unpaved shoulders, snow removal and ice control techniques. It is recommended that the customer thoroughly evaluate Stamark tapes under the conditions in the specified location before making large-scale applications. While experience has shown that, properly applied, these materials are highly effective traffic control devices, 3M makes no generalized performance claims.

### Storage

Store in a cool, dry area indoors. Use 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. Also refer to the MSDS for information about the volatile organic compound (VOC) content of chemical products. Consult local regulations and authorities for possible restrictions on product VOC content and/or VOC emissions. Electronically, visit us at [www.3M.com/us](http://www.3M.com/us) and select MSDS search.

## Literature Reference

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

- IF 270 ES    Application Guidelines for 3M™  
                 Stamark™ Tape Series 270 ES
- IF 5.2        Information Folder for 3M  
                 Highway Tape Applicator - HTA
- IF 5.7        Pavement Surface Preparation and  
                 Application Procedures for Stamark  
                 Pavement Marking Tapes
- IF 5.8        Application of 3M Stamark Precut  
                 Symbols and Legends
- IF 5.17      Instructions for using 3M Stamark  
                 Surface Preparation Adhesive  
                 P-50 for 3M Stamark Pavement Tapes
- IF 5.21      Instructions for using 3M Stamark Low  
                 VOC Surface Preparation Adhesive  
                 SPA60 for 3M Stamark Pavement  
                 Marking Tapes

## FOR INFORMATION OR ASSISTANCE CALL:

**1-800-553-1380**

## IN CANADA CALL:

**1-800-265-1840**

## Internet:

**[www.3M.com/tss](http://www.3M.com/tss)**

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### SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** 3M(TM) STAMARK(TM) PAVEMENT MARKING TAPE SERIES 270 ES (270 ES White and 271 ES Yellow)

**MANUFACTURER:** 3M

**DIVISION:** Traffic Safety Systems Division

**ADDRESS:** 3M Center  
St. Paul, MN 55144-1000

**EMERGENCY PHONE:** 1-800-364-3577 or (651) 737-6501 (24 hours)

**Issue Date:** 05/12/2006

**Supersedes Date:** 01/23/2006

**Document Group:** 20-2697-9

**Product Use:**

**Intended Use:** PAVEMENT MARKING TAPE

### SECTION 2: INGREDIENTS

<u>Ingredient</u>	<u>C.A.S. No.</u>	<u>% by Wt</u>
GLASS BEADS	65997-17-3	30 - 60
FILLERS	Unknown	10 - 30
SYNTHETIC RUBBER	Unknown	10 - 30
RESINS	Unknown	10 - 30
REFRACTORY CERAMIC FIBERS	142844-00-6	7 - 13
PIGMENTS (TITANIUM DIOXIDE OR YELLOW PIGMENT OR CARBON BLACK)	Unknown	1 - 10
CERAMIC PARTICLES	Unknown	1 - 5
POLYURETHANE	Unknown	1 - 5
PLASTIC BINDER	Unknown	1 - 5

### SECTION 3: HAZARDS IDENTIFICATION

#### 3.1 EMERGENCY OVERVIEW

**Specific Physical Form:** Roll of Tape

**Odor, Color, Grade:** white, yellow or black, minimal odor

General Physical Form: Solid

Immediate health, physical, and environmental hazards: The environmental properties of this product present a low environmental hazard. Contains a chemical or chemicals which can cause cancer.

### 3.2 POTENTIAL HEALTH EFFECTS

**Eye Contact:**

Dust created by cutting, grinding, sanding, or machining may cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

**Skin Contact:**

Mechanical Skin irritation: Signs/symptoms may include abrasion, redness, pain, and itching.

**Inhalation:**

Dust from cutting, grinding, sanding or machining may cause irritation of the respiratory system. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

**Ingestion:**

No health effects are expected.

**Carcinogenicity:**

Contains a chemical or chemicals which can cause cancer.

**CANCER HAZARDS:**

Refractory Ceramic Fibers are considered to be a potential cancer hazard from inhalation exposure. Studies, during grinding removal, have shown no respirable ceramic fibers in the breathing zone.

<u>Ingredient</u>	<u>C.A.S. No.</u>	<u>Class Description</u>	<u>Regulation</u>
CERAMIC FIBERS (AIRBORNE PARTICLES OF RESPIRABLE SIZE)	NONE	Group 2B	International Agency for Research on Cancer
CERAMIC FIBERS (AIRBORNE PARTICLES OF RESPIRABLE SIZE)	NONE	Anticipated human carcinogen	National Toxicology Program Carcinogens

### 3.3 POTENTIAL ENVIRONMENTAL EFFECTS

This substance does not leach metals or other RCRA (Resource Conservation and Recovery Act) listed TCLP (Toxic Characteristic Leaching Procedure) hazardous substances at concentrations that would make the product a hazardous waste.

## SECTION 4: FIRST AID MEASURES

### 4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.



**Eye Contact:** Flush eyes with large amounts of water. If signs/symptoms persist, get medical attention.

**Skin Contact:** Wash affected area with soap and water. If signs/symptoms develop, get medical attention.

**Inhalation:** If signs/symptoms develop, remove person to fresh air. If signs/symptoms persist, get medical attention.

**If Swallowed:** No need for first aid is anticipated.

## SECTION 5: FIRE FIGHTING MEASURES

### 5.1 FLAMMABLE PROPERTIES

Autoignition temperature	No Data Available
Flash Point	Not Applicable
Flammable Limits - LEL	Not Applicable
Flammable Limits - UEL	Not Applicable
OSHA Flammability Classification:	Not Applicable

### 5.2 EXTINGUISHING MEDIA

Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide). Ordinary combustible material. Use fire extinguishers with class A extinguishing agents (e.g., water, foam).

### 5.3 PROTECTION OF FIRE FIGHTERS

**Special Fire Fighting Procedures:** Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

**Unusual Fire and Explosion Hazards:** No unusual fire or explosion hazards are anticipated.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

**Accidental Release Measures:** Not applicable.

In the event of a release of this material, the user should determine if the release qualifies as reportable according to local, state, and federal regulations.

## SECTION 7: HANDLING AND STORAGE

### 7.1 HANDLING

Avoid breathing of dust. This product is considered to be an article which does not release or otherwise result in exposure to a hazardous chemical under normal use conditions.

### 7.2 STORAGE

Store under normal warehouse conditions.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

## 8.1 ENGINEERING CONTROLS

Provide ventilation adequate to control dust concentrations below recommended exposure limits and/or control dust. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits and/or control dust, fume, or airborne particles. If ventilation is not adequate, use respiratory protection equipment.

## 8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

### 8.2.1 Eye/Face Protection

Not applicable.

### 8.2.2 Skin Protection

Not applicable.

### 8.2.3 Respiratory Protection

Under normal use conditions, airborne exposures are not expected to be significant enough to require respiratory protection. Avoid breathing of dust.

### 8.2.4 Prevention of Swallowing

Not applicable.

## 8.3 EXPOSURE GUIDELINES

<u>Ingredient</u>	<u>Authority</u>	<u>Type</u>	<u>Limit</u>	<u>Additional Information</u>
CERAMIC FIBERS (AIRBORNE PARTICLES OF RESPIRABLE SIZE)	ACGIH	TWA, as fibers $\geq 5$ um	0.2 fiber/cc	Table A2

### SOURCE OF EXPOSURE LIMIT DATA:

ACGIH: American Conference of Governmental Industrial Hygienists

CMRG: Chemical Manufacturer Recommended Guideline

OSHA: Occupational Safety and Health Administration

AIHA: American Industrial Hygiene Association Workplace Environmental Exposure Level (WEEL)

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Specific Physical Form:

Roll of Tape

Odor, Color, Grade:

white, yellow or black, minimal odor

General Physical Form:

Solid

Autoignition temperature

No Data Available

Flash Point

Not Applicable

Flammable Limits - LEL

Not Applicable

Flammable Limits - UEL

Not Applicable

Boiling point

Not Applicable

Vapor Density

Not Applicable

Vapor Pressure

Not Applicable

Specific Gravity	Not Applicable
pH	Not Applicable
Melting point	No Data Available
Solubility In Water	Not Applicable
Evaporation rate	Not Applicable
Volatile Organic Compounds	Not Applicable
Percent volatile	Not Applicable
VOC Less H2O & Exempt Solvents	Not Applicable
Viscosity	Not Applicable

## SECTION 10: STABILITY AND REACTIVITY

**Stability:** Stable.

**Materials and Conditions to Avoid:** None known

**Hazardous Polymerization:** Hazardous polymerization will not occur.

### Hazardous Decomposition or By-Products

<u>Substance</u>	<u>Condition</u>
Aldehydes	During Combustion
Hydrocarbons	During Combustion
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Hydrogen Chloride	During Combustion
Hydrogen Cyanide	During Combustion
Oxides of Nitrogen	During Combustion

**Hazardous Decomposition:** Under recommended usage conditions, hazardous decomposition products are not expected. Hazardous decomposition products may occur as a result of oxidation, heating, or reaction with another material.

## SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

## SECTION 12: ECOLOGICAL INFORMATION

### ECOTOXICOLOGICAL INFORMATION

Not applicable.

### CHEMICAL FATE INFORMATION

Not applicable.



## SECTION 13: DISPOSAL CONSIDERATIONS

**Waste Disposal Method:** Dispose of waste product in a sanitary landfill. Incinerate in an industrial or commercial facility in the presence of a combustible material.

Since regulations vary, consult applicable regulations or authorities before disposal.

## SECTION 14: TRANSPORT INFORMATION

**ID Number(s):**

75-0001-1607-1, 75-0001-1608-9, 75-0001-1615-4, 75-0001-1683-2, 75-0301-3418-5, 75-0301-3419-3, 75-0301-3420-1, 75-0301-3421-9, 75-0301-3422-7, 75-0301-3423-5, 75-0301-3424-3, 75-0301-3425-0, 75-0301-3426-8, 75-0301-3427-6, 75-0301-3428-4, 75-0301-3471-4, 75-0301-4075-2, 75-0301-4076-0, 75-0301-4077-8, 75-0301-4078-6, 75-0301-4389-7

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

## SECTION 15: REGULATORY INFORMATION

### U.S. FEDERAL REGULATIONS

Contact 3M for more information.

**311/312 Hazard Categories:**

Fire Hazard - No   Pressure Hazard - No   Reactivity Hazard - No   Immediate Hazard - Yes   Delayed Hazard - Yes

### STATE REGULATIONS

Contact 3M for more information.

### CHEMICAL INVENTORIES

This product is an article as defined by TSCA regulations, and is exempt from TSCA Inventory listing requirements.

Contact 3M for more information.

### INTERNATIONAL REGULATIONS

Contact 3M for more information.

This MSDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

## SECTION 16: OTHER INFORMATION

### NFPA Hazard Classification

Health: 1 Flammability: 1 Reactivity: 0 Special Hazards: None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

### Revision Changes:

Section 14: ID Number(s) was modified.

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