

*This guide specification has been prepared by Propex Operating Company, LLC. (Propex) to assist design professionals in the preparation of a specification section covering nonwoven geosynthetic as an interlayer (paving fabric) above fatigued asphalt pavement and beneath an asphalt concrete overlay or chip seal surface treatment, or within new asphalt pavement; to provide a permanent moisture barrier and to retard fatigue and reflective cracking.*

*This specification allows the user to specify a recyclable paving fabric such as Petromat® Enviro (a millable and recyclable paving fabric). Petromat Enviro is engineered to provide a cooler working surface and less paving equipment tracking issues while maintaining the specified amount of asphalt cement tack coat when constructing in warm to hot weather.*

*Guidance for product specification is based upon the AASHTO M288 Paving Fabric Type I paving fabric with one critical modification for ability of the paving fabric to be able to be placed on all pavement surfaces, including milled surfaces.*

*This specification may be used as the basis for developing either a project specification or an office master specification. The specification has been prepared according to the MasterFormat principles established in the Manual of Practice published by The Construction Specifications Institute (CSI) including the use of section numbers and titles. This guide specification may be used in conjunction with most commercially available master specifications sections with minor editing.*

*The following should be noted in using this guide specification:*

*•Italicized text is for information and guidance and should not be included in the final specification.*

*-Optional text requiring a selection by the user is enclosed within brackets, e.g.: “Section [01 33 00] [\_\_\_\_].”*

*•Items requiring user input are enclosed within brackets, e.g.: “Section [\_\_\_\_ - \_\_\_\_].”*

*•Optional paragraphs are separated by an “OR” statement, e.g.:\*\*\*\* OR \*\*\*\**

*Copies of this specification or a user friendly MS Word version may be found on the Propex website [www.propexglobal.com](http://www.propexglobal.com) or by calling (800) 621-1273.*

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*Updated 06/05/2019*

**1 GENERAL**

**1.1 SECTION INCLUDES**

*Edit the following paragraph to suit project requirements.*

- A. This specification is applicable to the use of a recyclable paving fabric saturated with asphalt cement between pavement layers.
- B. The function of the paving fabric is to act as a waterproofing and stress absorption and relieving membrane within the pavement structure.

**1.2 RELATED SECTIONS**

*Edit the following paragraphs to coordinate with other sections of the Project Manual.*

- A. Section [31 20 00 – Earth Moving] [\_\_\_\_\_]
- B. Section [32 12 16 - Asphalt Paving] [\_\_\_\_\_]
- C. Section [32 01 16 - Flexible Paving Rehabilitation] [\_\_\_\_\_]

**1.3 UNIT PRICES**

*Include the following article only for unit price contracts or lump sum contract with unit price adjustments. Delete for lump sum contracts.*

- A. Method of Measurement: By the square meter (or square yard as indicated in contract documents) including tack coat, seams, overlaps, and wastage.
- B. Basis of Payment: By the square meter (or square yard - as indicated in contract documents) installed.

**1.4 REFERENCES**

*The following article assumes that the date of each reference standard will be the latest edition as of the date of the project specification. This provision must be defined in Division 1; coordinate with Division 1 statements.*

- A. American Association of State Highway and Transportation Officials (AASHTO)
  - 1. Standard Specification for Geotextile Specification for Highway Applications Designation AASHTO M 288-17
- B. American Society for Testing and Materials (ASTM):
  - 1. D276 – Method for Identification of Fibers in Textiles (Melting Point)
  - 2. D4354 – Practice for Sampling of Geosynthetics for Testing
  - 3. D4439 – Terminology for Geotextiles
  - 4. D4632 – Test Method for Grab Breaking Load and Elongation of Geotextiles
  - 5. D4759 – Practice for Determining the Specification Conformance of Geosynthetics
  - 6. D4873 – Guide for Identification, Storage, and Handling of Geotextiles
  - 7. D5035 – Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)
  - 8. D5199 – Standard Test Method for Measuring the Nominal Thickness of Geosynthetics
  - 9. D5261 – Test Method for Measuring Mass per Unit Area of Geotextiles
  - 10. D6140 – Standard Test Method to Determine Asphalt Retention of Paving Fabrics Used in Asphalt Paving for Full-Width Applications
- C. Geosynthetic Accreditation Institute - Laboratory Accreditation Program (GAI-LAP)

D. NTPEP – National Transportation Product Evaluation Program

**1.5 DEFINITIONS**

- A. *Minimum Average Roll Value (MARV)*: Property value calculated as typical minus two standard deviations. Statistically, it yields a 97.7 percent degree of confidence that any sample taken during quality assurance testing will exceed value reported.
- B. *Typical Roll Value*: Property value calculated from average or mean obtained from test data.
- C. *Minimum Test Value (MinTV)*: Property value taken from non-MQC testing performed annually and reported as the minimum test value of all tests performed.
- D. *Maximum Test Value (MaxTV)*: Property value taken from non-MQC testing performed annually and reported as the maximum test value of all tests performed.

**1.6 SUBMITTALS**

*Edit the following to coordinate with Division 1.*

- A. Submit under provisions of Section [01 33 00] [\_\_\_\_]:
  - 1. Third party testing, dated within past twelve months, showing product testing passes all tests.
  - 2. NTPEP test data may be used as third party testing.

**1.6 DELIVERY, STORAGE, AND HANDLING**

Geotextile labeling, printing on product, shipment and storage shall follow NTPEP GTX work plan, most recent year published.

The protective wrapping shall be maintained during periods of shipment and storage. If the wrapping is damaged prior to installation, the outer wrap of geotextile material must be discarded before installation.

During storage, geotextile rolls shall be elevated off the ground and adequately covered to protect them from the following: Site construction damage, extended exposure to ultraviolet (UV) radiation, precipitation, chemicals that are strong acids or strong bases, flames, sparks, temperatures in excess of 71 deg C (160 deg F) and any other environmental condition that might damage the geotextile.

**2 PRODUCTS**

**2.1 MANUFACTURERS**

Propex Operating Company, LLC, Chattanooga, Tennessee, 37419 USA, Phone (800) 621-1273.

*Edit the following to coordinate with Division 1.*

Substitutions: Alternate Millable Paving Fabric Manufacturers:

- A. Any alternate products seeking approval must be submitted to the Engineer 10 days prior to the bid date. For acceptance on this project, any alternates seeking approval must meet the requirements outlined in this document. The alternate's product specifications and a product sample must be submitted to the Engineer for approval.
- B. All product manufacturers seeking approval on this project must have local representation within the state in which the project is bidding. Manufacturers seeking approval must also have a manufacturer's representative present at the prebid meeting.

2.2 MATERIALS

- A. The geotextile construction shall be a needle-punched nonwoven geotextile composed of 100% polypropylene or polypropylene / recycled polyester blend, staple fiber and heat calendered on one side.
- B. The geotextile shall meet the following property values:

| Property                                                                | Test Method              | Units                                   | Value      |
|-------------------------------------------------------------------------|--------------------------|-----------------------------------------|------------|
| Mass Per Unit Area <sup>1</sup>                                         | ASTM D 5261              | g/m <sup>2</sup> (oz/yd <sup>2</sup> )  | 153 (4.5)  |
| Asphalt Retention <sup>4</sup>                                          | ASTM D 6140              | l/m <sup>2</sup> (gal/yd <sup>2</sup> ) | 0.9 (0.20) |
| Grab Tensile Strength <sup>2</sup> (MD, CMD, 45 bias)                   | ASTM D 4632              | N (lbs)                                 | 400 (90)   |
| Grab Elongation <sup>2</sup> (MD, CMD, 45 bias)                         | ASTM D 4632              | Percent                                 | >25        |
| Strip Tensile Strength <sup>1</sup> (MD, CMD, 45 bias)                  | ASTM D5035               | N (lbs)                                 | 200 (45)   |
| Strip Elongation <sup>1</sup> (MD, CMD, 45 bias)                        | ASTM D5035               | Percent                                 | >25        |
| Asphalt Saturated Grab Tensile Strength <sup>4</sup> (MD, CMD, 45 bias) | ASTM D6140<br>ASTM D4632 | N (lbs)                                 | 1023 (230) |
| Asphalt Saturated Grab Elongation <sup>4</sup> (MD, CMD, 45 bias)       | ASTM D6140<br>ASTM D4632 | Percent                                 | >25        |
| Thickness <sup>1</sup>                                                  | ASTM D5199               | mm (mils)                               | 0.89 (35)  |
| Asphalt Saturated Thickness <sup>4</sup>                                | ASTM D6140<br>ASTM D5199 | mm( mils)                               | 1.78 (70)  |
| Melting Point <sup>2</sup>                                              | ASTM D 276               | Degrees C (F)                           | 160 (320)  |
| Solar Reflectance Temperature Reduction                                 | Measured                 | Degrees C (F)                           | 10 (50)    |
| Trapezoidal Tear Strength <sup>2</sup>                                  | ASTM D4533               | lbs                                     | < 45       |
| Asphalt Saturated Trapezoidal Tear Strength <sup>3</sup>                | ASTM D6140<br>ASTM D4533 | lbs                                     | <25        |
| Milled Enviro RAP Particle Size Distribution <sup>5</sup>               | ASTM C117,<br>C136       | % passing 1.0"<br>% passing 0.75"       | 100<br>95  |
| <b>Recycled Pavement Enhancement with 30% Enviro RAP</b>                |                          |                                         |            |
| Dry Tensile Strength <sup>6</sup>                                       | AASHTO T283              | psi                                     | > 200      |
| TSR – Tensile Strength Ratio                                            | AASHTO T283              | %                                       | > 0.9      |
| Maximum Rut Depth at 20,000 passes <sup>6</sup>                         | AASHTO T324              | mm                                      | <2.9       |
| Asphalt Stripping at 20,000 passes <sup>6</sup>                         | AASHTO T324              | ---                                     | None       |
| Flexibility Index with Enviro RAP <sup>6</sup>                          | I-FIT <sup>6</sup>       | ---                                     | >4.5       |

1. Minimum Average Roll Value (MARV) values shown represent weaker principal direction.
2. Typical (Average) values shown represent weaker principal direction.
3. Maximum Test Value (MaxTV) per ASTM D8102 performed annually by third party testing.
4. Minimum Test Value (MinTV) per ASTM D8102 performed annually by third party testing.
5. Field evaluation and testing by NCAT (National Center for Asphalt Technology) or an independent third party approved by project engineer.
6. I-FIT - Illinois Flexibility Index Test

**C. Tack Coat:**

1. The sealant material used to impregnate, bond and seal the geotextile to both the base pavement and overlay shall be a paving grade asphalt recommended by the geotextile manufacturer and approved by the Engineer, such as PG-22.
2. Quantity of the asphalt cement tack coat shall be as recommended by the manufacturer, generally between 0.22 and 0.30 gallons per square yard, depending on the asphalt retention of the paving fabric and the condition of the pavement onto which the paving fabric is to be installed.
3. Uncut asphalt cements are the preferred sealants; however, cationic and anionic emulsions may be used, if approved by the manufacturer and engineer. The residual asphalt cement must meet project specifications. Cutbacks and emulsions, which contain solvents, shall not be used.
4. Contractor shall submit proposed sealant to engineer at least 15 days prior to installation.
5. The grade of asphalt cement specified for hot-mix design in each geographic location is generally the most acceptable material.

**D. Equipment:**

1. The asphalt distributor truck shall be capable of spraying the asphalt sealant at the prescribed uniform application rate. No streaking, skipping, or dripping will be permitted. The distributor shall also be equipped with a hand spray having a single nozzle and positive shut-off valve.
2. Mechanical or manual lay down equipment shall be capable of laying the geotextile smoothly.
3. The following miscellaneous equipment shall be provided: stiff bristle brooms or squeegees to smooth the geotextile; scissors or blades to cut the geotextile; brushes for applying asphalt sealant to geotextile overlaps.
4. Pneumatic rolling equipment to smooth the geotextile into the sealant, and sanding equipment may be required for certain jobs. Rolling is especially required on jobs where thin lifts or chip seals are being placed. Rolling helps ensure the geotextile bond to the adjoining pavement layers in the absence of heat and weight associated with thicker lifts of asphaltic pavement.

**3 Construction Procedures**

1. Follow manufacturer's installation guidelines for instructions on how to properly install the paving fabric and the subsequent paving materials—for Propex, go to [www.propexglobal.com](http://www.propexglobal.com)
2. A preconstruction meeting is recommended to take place no less than 15 days before construction.