

# Petromat and AASHTO M355-24

The use and range of geosynthetic paving interlayer products in transportation applications has continued to increase over the past few decades. To meet the demand for products to meet varying field and traffic conditions, new interlayer types and products have been developed for the market.

Up until now, AASHTO M288 only included two interlayer products types, under the single paving fabric product type. So, the AASHTO M288 did not account for four new product types that have since been developed. Although the growth in the interlayer product portfolio has resulted in greater acceptance of geosynthetic interlayers, it has also created confusion concerning the appropriate index properties required for interlayers in general transportation applications. As a result, a joint committee was formed comprising Scott Hidden who represents the American Association of State Highway and Transportation Officials (AASHTO) and then members of the interlayer task group within the Geosynthetic Materials Association (GMA), to develop a new AASHTO standard that would include all interlayer product types for transportation applications. The result of this effort is the “Geosynthetic Pavement Interlayers for Highway Applications,” AASHTO M355-24.

## Interlayer product selection criteria

AASHTO M355-24 is a material specification, and not a design guideline. It is therefore important to select an interlayer product that is appropriate for the climatic environment, current and forecast traffic, pavement type and distress conditions.

AASHTO M355-24 now characterizes all paving interlayers into four classes and a strip membrane. Under each paving interlayer class and the strip membrane, there are either two or three types of product, each type is based on one or more common index properties (e.g. tensile strength).

Designers should be aware that the categorization of these pavement interlayer classes and their types is based on properties from index testing rather than performance testing, so it is not possible to determine or rank the performance of products based on these properties alone.

There are three main functions that asphalt interlayers are well known for, but not all interlayer products are eligible to provide all three functions.

The index properties and physical structure of the product will provide the specifier and installer the necessary product information to ensure that the correct product has been specified and will be installed on the project.

For the moisture barrier function, we recommend that the asphalt binder quantity should be 0.20 gal/sy or more.

For the reflective cracking function, all interlayers will provide reflective crack benefits, but some more than others.

For the traffic improvement function, the 50kN or stronger paving mats and composite paving grids are best suited to provide traffic improvement benefits. However, only products that have been tested using four point strain controlled unnotched beam fatigue testing are eligible for this function.

Normally, either the reflective crack performance function, or the traffic improvement function is the primary design need of the engineer. So, the interlayer product will normally be chosen based on one of these two functions. As the one function is normally more important for any given project, it is likely that you will still attain some benefit from the product for the other function.

For the third function, namely the moisture barrier function, all Solmax interlayers will provide the moisture barrier function.

Once the product has been selected, and the design functions have been identified, then it is possible to calculate the amount of extra asphalt you would need to achieve the same performance as the interlayer product.

## Conclusion

It is therefore important to select an interlayer product that is appropriate for the climatic environment, current and forecast traffic, pavement type and distress conditions. Most manufacturers will provide a product selection guide, and Solmax offers the product selection wheel. This guide has been developed based on research, analysis, and empirical data.

Tables 1, 2, and 3 summarize the different AASHTO M355-24 classes and their types, while Table 4 shows the appropriate Solmax product for each of the three tables.

For further information on Solmax and AASHTO M355-24 contact your local Solmax Representative or call (800) 685-9990. To order a copy of the complete AASHTO M355-24 specification, contact AASHTO at (202) 624-5800.

# AASHTO M355-24 Selection Guide

**Table 1: Paving fabric (class 1) property requirements**

	Test method	Units	Type I	Type II
Grab strength <sup>(a)</sup>	ASTM D4632	lbf (N)	120 (534)	101 (450)
Elongation <sup>(a)</sup>	ASTM D4632	%	50	50
Mass per unit area <sup>(a)</sup>	ASTM D5261	oz/sq yd (gm/m <sup>2</sup> )	4.5 (152)	4.1 (139)
Melting Point <sup>(a)(b)</sup>	ASTM D276	°F (°C)	320 (160)	320 (160)

<sup>(a)</sup> Values represent MARV and for grab strength and elongation, in the weaker principal direction. (See Section 3)

<sup>(b)</sup> Melting point represents lowest melting point temperature of any component of the product.

**Table 2: Paving mat, paving grid and paving composite grid (Class 2 to 4) property requirements**

			Pavement interlayer class and type								
	Test method	Units	Paving mat (Class 2)			Paving grid (Class 3)			Paving composite grid (Class 4)		
			Type I	Type II	Type III	Type I	Type II	Type III	Type I	Type II	Type III
Mat breaking strength <sup>(a)</sup>	ASTM D5035	lbf/2 in (N/50 mm)	57 (2500)	286 (1250)	45 (200)						
Mat elongation <sup>(b)</sup>	ASTM D5035	%	5	5	5						
Geogrid tensile strength <sup>(a)(c)</sup>	ASTM D6637	lbf/in (kN/m)				571 x 1142 (100 x 200)	571 x 571 (100 x 100)	286 x 286 (50 x 50)	571 x 1142 (100 x 200)	571 x 571 (100 x 100)	286 x 286 (100 x 100)
Geogrid elongation <sup>(b)</sup>	ASTM D6637	%				3	3	3	3	3	3
Geogrid Aperture Size <sup>(b)</sup>	Direct measure	in (mm)				0.5 (127)	0.5 (127)	1.0 (254)	0.5 (127)	0.5 (127)	1.0 (254)
Mass per unit area <sup>(a)</sup>	ASTM D5261	oz/sq yd (gm/m²)	7.0 (237)	4.0 (136)	4.0 (136)	16.0 (542)	10.0 (339)	5.5 (186)	16.0 (542)	10.0 (339)	5.5 (186)
Melting point <sup>(a)(d)</sup>	ASTM D276	°F (°C)	420 (216)	420 (216)	420 (216)	420 (216)	420 (216)	420 (216)	320 (160)	320 (160)	320 (160)

<sup>(a)</sup> Values represent MARV and for breaking strength, in the weaker principal direction. For geogrid wide width tensile strengths, MD x CD values represent MARV in the machine direction (MD) and cross-machine direction (CD). (See Section 3)

**Table 3: Strip membrane property requirements**

	Test method	Units	Type I	Type II
Thickness <sup>(a)</sup>	ASTM D1777	mils (mm)	65 (1.65)	135 (3.43)
Tensile Strength <sup>(b)</sup>	ASTM D882	psi (kPa)	750 (5170)	1200 (8275)
Elongation <sup>(b)</sup>	ASTM D882	%	50	10
Permeance <sup>(a)</sup>	ASTM E96	%	50	50
Water method	Perms	0.10	—	4.1 (139)
Puncture <sup>(b)</sup>	ASTM E154	lb (kg)	200 (91)	500 (227)
Pliability/cold flexibility	ASTM D146	no breaks	@ 0°F (-18°C)	@ 32°F (0°C)

<sup>(a)</sup> Thickness values represent typical values and permeance values represent maximum (<) values. (See Section 3)

<sup>(b)</sup> Values represent MARV and for tensile strength and elongation, in the weaker principal direction. (See Section 3)

**Table 4: Solmax products to fit each of the tables in the AASHTO M355 specifications**

	Type I	Type II	Type III
Paving fabric	Petromat® MPV600	Petromat MPV500	
	Petromat MPV700		
Paving mat	Petromat MPM50E	Petromat MPM30	None
Paving grid	None	None	None
Paving composite grid	None	Petromat MPG4100 Petromat MPG100	Petromat MPG4
Strip membrane	Petrotac	None	