

ITEM 402.06710118	6.3 mm F1 POLYMER-MODIFIED HMA, 70 SERIES COMPACTION
ITEM 402.06711118	PLANT PRODUCTION QUALITY ADJUSTMENT TO 402.06710118
ITEM 402.06720118	6.3 mm F2 POLYMER-MODIFIED HMA, 70 SERIES COMPACTION
ITEM 402.06721118	PLANT PRODUCTION QUALITY ADJUSTMENT TO 402.06720118
ITEM 402.06730118	6.3 mm F3 POLYMER-MODIFIED HMA, 70 SERIES COMPACTION
ITEM 402.06731118	PLANT PRODUCTION QUALITY ADJUSTMENT TO 402.06730118
ITEM 407.02 18	TACK COAT FOR 6.3 MM POLYMER-MODIFIED HMA

The requirements of Section 401 - Plant Production and Section 402 - Hot mix Asphalt (HMA) Pavements shall apply except as modified below.

DESCRIPTION

This work shall consist of developing Polymer-Modified HMA mixture using the Superpave Mix Design procedure detailed in Materials Method 5.16, "Superpave Hot Mix Asphalt Mixture Design and Mixture Verification Procedures," except as modified in these specifications. Polymer-Modified HMA is a mixture of Performance-Graded Binder (PG Binder), mineral aggregate, and mineral filler, if required. Polymer-Modified HMA pavement course shall be constructed in accordance with these specifications and in reasonably close conformity with the required lines, grades, thicknesses, and typical sections shown on the plans or established by the Engineer. This is a performance-based specification in which the Contractor is responsible for compacting the pavement to a specified density requirement. Written instructions for determining pavement density are available from the Regional Materials Engineer or the Director, Materials Bureau. All necessary pavement repairs, crack sealing, joint sealing, pavement marking removal, utility grade adjustments, and milling of rebates will be paid under appropriate items.

MATERIALS

A. Polymer-Modified Mixture

The materials and composition for Polymer-Modified mixtures shall meet the requirements specified in §401-2 Materials, except as noted herein.

Produce Polymer-Modified HMA in accordance with the procedures outlined in this specification and NYSDOT's Material Method 5.16, Superpave Hot Mix Asphalt Mixture Design and Mixture Verification Procedures except as modified below:

Formulate and submit to the Regional Materials Engineer a Polymer-Modified HMA design, which satisfies design criteria outlined in this specification. The minimum PG Binder content shall not be less than 6.0%.

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Table 1 – 6.3 mm Polymer-Modified HMA Design Control Points

Standard Sieves (mm)	Percent Passing Criteria	
	Maximum	Minimum
9.5		100
6.30	100	90
4.75	90	
2.36	70	37
0.075	10	2

Table 2 – 6.3 mm Polymer-Modified HMA Mixture Additional Aggregate Criteria

Coarse Aggregate Angularity (Percent), minimum	Uncompacted Void Content of Fine Aggregate (Percent), minimum	Flat-and-elongated Particles (Percent), maximum	Sand Equivalent (Percent), minimum
95/90	43	10	45

Table 3 – 6.3 mm Polymer-Modified HMA Volumetric Design Criteria

% Gmm @ Ninitial	% Voids Filled with Binder		% Voids in the Mineral Aggregate, minimum
	Minimum	Maximum	
< 90.5	70	78	16

Table 4 – 6.3 mm Polymer-Modified HMA Design Number of Gyration

Compactive Effort Number of Gyration	Ninitial	Ndesign	Nmaximum
	7	75	115

Table 5 – 6.3 mm Polymer-Modified HMA Production Gradation Tolerances

Sieve Size (mm)	9.5	6.3	4.75	2.36	1.18	0.600	0.300	0.150	0.075
Tolerance	± 4	± 4	± 3	± 3	± 3	± 2	± 2	± 2	± 2

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1. Coarse Aggregate Type F1 Conditions

1. Limestone, dolomite, or a blend of the two having an acid insoluble residue content of not less than 20%.
2. Sandstone, granite, chert, traprock, ore tailings, slag, or other similar noncarbonate materials.
3. Use gravel or blend two or more of: gravel, limestone, dolomite, sandstone, granite, chert, traprock, ore tailings, or other similar materials to produce a final blend of which the noncarbonate plus 2.36 mm material comprises at least 30% of the total aggregate. In addition, at least 95% of the plus 4.75 material must be noncarbonate.

2. Coarse Aggregate Type F2 Conditions

1. Limestone, dolomite, or a blend of the two having an acid insoluble residue content of not less than 20%.
2. Sandstone, granite, chert, traprock, ore tailings, slag, or other similar noncarbonate materials.
3. Use gravel or blend two or more of: gravel, limestone, dolomite, sandstone, granite, chert, traprock, ore tailings, or other similar materials to produce a final blend of which the noncarbonate plus 2.36 mm material comprises at least 10% of the total aggregate. In addition, at least 20% of the plus 4.75 material must be noncarbonate.

3. Coarse Aggregate Type F3 Conditions

1. Limestone or a blend of limestone and dolomite having an acid insoluble residue content of not less than 20%.
2. Dolomite.
3. Sandstone, granite, chert, traprock, ore tailings, slag, or other similar noncarbonate materials.
4. Use gravel or blend two or more of: gravel, limestone, dolomite, sandstone, granite, chert, traprock, ore tailings, or other similar materials to produce a final blend of which the noncarbonate plus 2.36 mm material comprises at least 10% of the total aggregate. In addition, at least 20% of the plus 4.75 material must be noncarbonated.

PG Binder. Use the appropriate Performance-Graded Binder (PG Binder), as listed in Table 6 below, in the production of these mixtures that meets the AASHTO M 320 - Standard

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Specification for Performance-Graded Asphalt Binder.

Table 6 - PG Binder

Location	PG Binder ¹
Downstate ²	Polymer-Modified PG 76-22
Upstate ³	PG 64-28 with an minimum of 60% Elastic Recovery ⁴

NOTES:

1. Use of all other PG Binder grades allowed only by approval of the Director of the Materials Bureau. If allowed, use Table 401-7, Delivery Ticket Mix Coding, of the Standard Specifications to properly identify the PG Binder grade on the delivery ticket.
2. "Downstate" is defined as the counties of Orange, Rockland, Putnam, Westchester, Nassau, Suffolk, and the City of New York.
3. "Upstate" is defined as all other counties except as noted in Note 1.
4. Elastic Recovery, AASHTO T301-95, 100 mm elongation and cut immediately at 25°C.

B. Tack Coat

Use an asphalt emulsion as tack coat meeting the requirements of §702 - Bituminous Materials, RS-1, Item 702-3001 or CRS-1, Item 702-4001, or other asphalt emulsion as approved by the Engineer with the following modifications:

Table 7 - Tests on Asphalt Base for Emulsion

Test on Base Asphalt	Min.	Max
Penetration, 25°C, 100 g, 5 s	60	100
Ductility, 25°C, 5 cm/min, cm	50	-

Table 8 - Tests on Residue from Distillation Test

Test on Residue	Min.	Max.
Penetration, 25°C, 100 g, 5 s	40	90

CONSTRUCTION DETAILS

The provisions of §401-3 and §402-3, Construction Details, shall apply.

METHOD OF MEASUREMENT

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A. Polymer-Modified Mixture

The provisions of §401-4 and §402-4, Method of Measurement, shall apply except as modified herein.

Mix Type	Code	Code¹	Design ESAL	Code	Consensus Properties	Code	PG Binder Type	Code
6.3 mm	06	F1	<3.0 million	2	<100 mm	Y	PG 64-28	C
----	----	F2	----	----	----	----	PG 76-22	E
----	----	F3	----	----	----	----	----	----

Notes:

1. Friction Aggregate Classification Codes
2. Delivery Ticket Mix Coding Example: 6.3 mm, Type F2 friction requirements, PG 64-28 with a minimum of 60% Elastic Recovery - Mix Coding on Delivery Ticket: **06F22YC**.

B. Tack Coat

The quantity to be paid for will be the number of liters of asphalt emulsion for tack coat measured at 15°C incorporated into the work.

BASIS OF PAYMENT

A. Polymer-Modified Mixture

The provisions of subsection 402-5 Basis of Payment shall apply.

B. Tack Coat

The unit price bid per liter for tack coat shall include the cost of furnishing materials and all equipment and labor necessary to complete the work.

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Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
402.06710118	6.3 mm F1 Polymer-Modified HMA, 70 Series Compaction	Metric Ton
402.06711118	Plant Production Quality Adjustment to 402.06710118	Quality Unit
402.06720118	6.3 mm F2 Polymer-Modified HMA, 70 Series Compaction	Metric Ton
402.06721118	Plant Production Quality Adjustment to 402.06720118	Quality Unit
402.06730118	6.3 mm F3 Polymer-Modified HMA, 70 Series Compaction	Metric Ton
402.06731118	Plant Production Quality Adjustment to 402.06730118	Quality Unit
407.02----18	Tack Coat	Liter