

600-6 POLYMER MODIFIED ASPHALT CONCRETE (PMAC) PAVEMENT.

600-6.1 General. Polymer modified asphalt concrete pavement shall consist of one course of polymer modified asphalt concrete (PMAC) placed upon existing or new asphalt concrete pavement. PMAC shall be of the class and grade specified on the Plans.

600-6.2 Mix Designs. Mix designs shall conform to 203-6.2.

600-6.3 Polymer Modified Asphalt Concrete(PMAC).

600-6.3.1 General. PMAC shall be the product of mixing mineral aggregate and a maximum of 15 percent reclaimed asphalt pavement (RAP) with polymer modified paving asphalt at a central mixing plant.

PMAC shall be designated by class and grade (i.e. "C2-PG 64-28PM"). PMAC containing up to 15 percent RAP shall be identified by adding the suffix "RAP" to the class and grade (i.e. "C2-PG 64-10PM-RAP").

600-6.3.2 Polymer Modified Paving Asphalt. Polymer modified paving asphalt shall conform to Table 600-6.3.1 (A). Tire rubber modified paving asphalt conforming to Table 600-6.3 (B) may be substituted for polymer modified paving asphalt. The Contractor shall submit in accordance with 2-5.3 a Certificate of Compliance conforming to 4-1.5.

TABLE 600-6.3 (A)
Performance Graded Polymer Modified Paving Asphalt ^a

Property	AASHTO Test Method	Specification Grade		
		PG 58-34 PM	PG 64-28 PM	PG 76-22 PM
Original Binder				
Flash Point, Minimum °C	T 48	230	230	230
Solubility, Minimum % ^b	T 44 ^c	98.5	98.5	98.5
Viscosity at 135°C, ^d Maximum, Pa·s	T 316	3.0	3.0	3.0
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(delta), kPa	T 315	58 1.00	64 1.00	76 1.00
RTFO Test , Mass Loss, Maximum, %	T 240	1.00	1.00	1.00
RTFO Test Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(delta), kPa	T 315	58 2.20	64 2.20	76 2.20
Dynamic Shear, Test Temp. at 10 rad/s, °C Maximum (delta), %	T 315	Note e 80	Note e 80	Note e 80
Elastic Recovery ^f , Test Temp., °C Minimum recovery, %	T 301	25 75	25 75	25 65
PAV ^g Aging, Temperature, °C	R 28	100	100	110
RTFO Test and PAV Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Maximum G*·sin(delta), kPa	T 315	16 5000	22 5000	31 5000
Creep Stiffness, Test Temperature, °C Maximum S-value, MPa Minimum M-value	T 313	-24 300 0.300	-18 300 0.300	-12 300 0.300

Notes:

- a. Do not modify PG Polymer Modified using acid modification.
- b. The Engineer waives this specification if the supplier is a Quality Supplier as defined by Caltrans' "Certification Program for Suppliers of Asphalt."
- c. ASTM D 5546 may be used instead of AASHTO T 44.
- d. The Engineer will waive this specification if the supplier certifies the paving asphalt can be adequately pumped and mixed at temperatures meeting applicable safety standards.
- e. Test temperature is the temperature at which G*/sin(delta) is 2.2 kPa. A graph of log G*/sin(delta) plotted against temperature may be used to determine the test temperature when G*/sin(delta) is 2.2 kPa. A graph of (delta) versus temperature may be used to determine delta at the temperature when G*/sin(delta) is 2.2 kPa. The Engineer will accept direct measurement of (delta) at the temperature when G*/sin(delta) is 2.2 kPa.
- f. Tests without a force ductility clamp may be performed.
- g. "PAV" means Pressurized Aging Vessel.

TABLE 600-6.3 (B)

Performance Graded Tire Rubber Modified Paving Asphalt

Property	AASHTO Test Method	Specification Grade		
		PG 58-34 TR	PG 64-28 TR	PG 76-22 TR
Original Binder				
Flash Point, Minimum °C	T 48	230	230	230
Solubility, Minimum % ^b	T 44 ^c	97.5	97.5	97.5
Viscosity at 135°C, ^d Maximum, Pa·s	T 316	3.0	3.0	3.0
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(delta), kPa	T 315	58 1.00	64 1.00	76 1.00
RTFO Test, Mass Loss, Maximum, %	T 240	1.00	1.00	1.00
RTFO Test Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(delta), kPa	T 315	58 2.20	64 2.20	76 2.20
Dynamic Shear, Test Temp. at 10 rad/s, °C Maximum (delta), %	T 315	Note e 80	Note e 80	Note e 80
Elastic Recovery ^f , Test Temp., °C Minimum recovery, %	T 301	25 75	25 75	25 65
PAV ^g Aging, Temperature, °C	R 28	100	100	110
RTFO Test and PAV Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Maximum G*sin(delta), kPa	T 315	16 5000	22 5000	31 5000
Creep Stiffness, Test Temperature, °C Maximum S-value, MPa Minimum M-value	T 313	-24 300 0.300	-18 300 0.300	-12 300 0.300

Notes:

- Do not modify PG Tire Rubber Modified using acid modification.
- The Engineer will waive this specification if the supplier is a Quality Supplier as defined by the Caltrans' "Certification Program for Suppliers of Asphalt."
- ASTM D 5546 may be used instead of AASHTO T 44.
- The Engineer will waive this specification if the supplier certifies the paving asphalt can be adequately pumped and mixed at temperatures meeting applicable safety standards.
- Test temperature is the temperature at which G*/sin(delta) is 2.2 kPa. A graph of log G*/sin(delta) plotted against temperature may be used to determine the test temperature when G*/sin(delta) is 2.2 kPa. A graph of (delta) versus temperature may be used to determine delta at the temperature when G*/sin(delta) is 2.2 kPa. The Engineer also accepts direct measurement of (delta) at the temperature when G*/sin(delta) is 2.2 kPa.
- Tests without a force ductility clamp may be performed.
- "PAV" means Pressurized Aging Vessel.

600-6.3.2 Aggregate. Aggregate shall conform to 203-6.3.2.

600-6.3.3 Mineral Filler. Mineral filler shall conform to 203-6.3.3.

600-6.3.4 Mixtures. Mixtures shall conform to 203-6.4.

600-6.3.5 Aggregate Storing, Drying and Screening. Aggregate storing, drying and screening shall conform to 203-6.5.

600-6.3.6 Proportioning. Proportioning shall conform to 203-6.6.

600-6.3.7 Mixing. Mixing shall conform to 600-6.7.

600-6.3.8 Polymer Modified Asphalt Concrete Storage. PMAC storage shall conform to 203-6.8.

600-6.3.9 Miscellaneous Requirements. Miscellaneous requirements shall conform to 203-6.9.

600-6.4 Tack Coat. Tack coat shall conform to 302-5.4.

600-6.5 Distribution and Spreading. Distribution and spreading shall conform to 302-5.5.

600-6.6 Rolling. Rolling shall conform to 302-5.6.

600-6.7 Joints. Joints shall conform to 302-5.7.

600-6.8 Manholes (and other structures). Manholes and other structures shall conform to 302-5.8.

600-6.7 Measurement and Payment. Measurement and payment shall conform to 302-5.9. Payment for polymer modified asphalt concrete will be made at the Contract Unit Price for "POLYMER MODIFIED ASPHALT CONCRETE."