CMT ENGINEERING LABORATORIES
Construction • Materials • Technologies
Geotechnical, Environmental, & Materials Engineering/Testing/Research

ASPHALT & EMULSION LABORATORY

Client: Axion Global Engineering Limited
Project Info: Rheological property determination of different blends of PG 64-22 with given polymers
CMT ID: AE 448
Test Date: Sept 6th 2014

Test Required:

1. Prepare Polymer Modified Blends of Unmodified PG 64-22 with Axion Bitumen Booster (P) and (L) in following proportions;
   A. PG 64-22 + 3% Axion Bitumen Booster (P)
   B. PG 64-22 + 3% Axion Bitumen Booster (P) + 0.25% Axion Bitumen Booster (L)
   C. PG 64-22 + 3% Axion Bitumen Booster (P) + 0.50% Axion Bitumen Booster (L)
2. Perform DSR Original (AASHTO T 315) on PG 64-22 and three Polymer modified blends
3. Perform Elastic Recovery (AASHTO T301) on RTFO Aged Residues (AASHTO T 240)

TEST	Temp	Method	SPECIFICATION	REPORT	RESULT
ORIGINAL BINDER					
BASE ASPHALT PG 64-22					
Dynamic Shear, G*/sin δ, 10 rad/sec	64°C	T315	Min. 1.0 kPa	1.25	Pass
Dynamic Shear, G*/sin δ, 10 rad/sec	70°C	T315	Min. 1.0 kPa	0.592	Fail
Tc (High) Original = 65.8 °C					
PG 64-22 + 3% AXION BITUMEN BOOSTER (P)					
Dynamic Shear, G*/sin δ, 10 rad/sec	64°C	T315	Min. 1.0 kPa	3.17	Pass
Dynamic Shear, G*/sin δ, 10 rad/sec	70°C	T315	Min. 1.0 kPa	1.64	Pass
Dynamic Shear, G*/sin δ, 10 rad/sec	76°C	T315	Min. 1.0 kPa	0.887	Fail
Tc (High) Original = 74.8 °C					
PG 64-22 + 3% AXION BITUMEN BOOSTER (P) + 0.25% AXION BITUMEN BOOSTER (L)					
Dynamic Shear, G*/sin δ, 10 rad/sec	64°C	T315	Min. 1.0 kPa	3.89	Pass
Dynamic Shear, G*/sin δ, 10 rad/sec	70°C	T315	Min. 1.0 kPa	2.09	Pass
Dynamic Shear, G*/sin δ, 10 rad/sec	76°C	T315	Min. 1.0 kPa	1.16	Pass
Dynamic Shear, G*/sin δ, 10 rad/sec	82°C	T315	Min. 1.0 kPa	0.676	Fail
Tc (High) Original = 77.7 °C					

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PG 64-22 + 3% AXION BITUMEN BOOSTER (P) + 0.5% AXION BITUMEN BOOSTER (L)

Dynamic Shear, G*/sin δ, 10 rad/sec	64°C	T315	Min. 1.0 kPa	4.77	Pass
Dynamic Shear, G*/sin δ, 10 rad/sec	70°C	T315	Min. 1.0 kPa	2.60	Pass
Dynamic Shear, G*/sin δ, 10 rad/sec	76°C	T315	Min. 1.0 kPa	1.46	Pass
Dynamic Shear, G*/sin δ, 10 rad/sec	82°C	T315	Min. 1.0 kPa	0.843	Fail

Tc (High) Original = 80.1 °C

ROLLING THIN FILM OVEN(T240)

BASE ASPHALT PG 64-22

Elastic Recovery, %	25°C	T301	6.0

PG 64-22 + 3% AXION BITUMEN BOOSTER (P)

Elastic Recovery, %	25°C	T301	75.0

PG 64-22 + 3% AXION BITUMEN BOOSTER (P) + 0.25% AXION BITUMEN BOOSTER (L)

Elastic Recovery, %	25°C	T301	79.0

PG 64-22 + 3% AXION BITUMEN BOOSTER (P) + 0.5% AXION BITUMEN BOOSTER (L)

Elastic Recovery, %	25°C	T301	79.0

REPORT AND ANALYSIS:

1. Based on Original DSR,
   a) PG 64-22 is graded at PG 64-XX. The True Grade is 65.8°C
   b) PG 64-22 + 3% Axion Bitumen Booster (P) is graded at PG 70-XX. The true grade is 74.8°C
   c) PG 64-22 + 3% Axion Bitumen Booster (P) + 0.25% Axion Bitumen Booster (L) is graded at PG 76-XX. The true grade is 77.7°C
   d) PG 64-22 + 3% Axion Bitumen Booster (P) + 0.50% Axion Bitumen Booster (L) is grade at PG 76-XX. The true grade is 80.1 °C.

Approved: Prabhat Gupta, P.E.

Senior Engineer

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