Province: Manitoba	**Materials:** Asphalt Cements
Date Last Reviewed: 04-05-20	**Web Address:** http://www.gov.mb.ca/
Materials Engineer:	**Contact Info:**

Asphalt Cement		
	Description	Asphalt Cements
	PMA's	58-34P, 58-37P, 58-40P
	Exclusions	None listed. Manufacturers/Suppliers must be listed on Manitoba Infrastructure "Approved Product List" for Asphalt Cements.

Manitoba		**Table 1: Requirements for Performance-Graded Asphalt Cement** (Note1)				
Property		**Test Method: AASTHO (T), ASTM (D) or other**	**Requirements by Performance Grade**			
			58-28	**58-34P**	**58-37P**	**58-40P**
ORIGINAL						
Flash Point, °C		T48	230 min.			
Rotational Viscosity, Pa·s	135 °C	T316	3.0 max.			
Dynamic Shear, kPa (G*/sin δ, 10 rad./sec)	At Grade Temperature	T315	1.00 min.			
RTFO RESIDUE		T240				
Mass Change, %		T240	1.00 max.			
Dynamic Shear, kPa (G*/sin δ, 10 rad./sec.)	At Grade Temperature	T315	2.20 min.			
MSCR, J_{nr} @ 3.2kPa (kPa^{-1})	58 °C	T350	-			
MSCR, % Recovery @ 3.2kPa, $R_{3.2}$	58 °C	T350	-	25	40	40
PAV RESIDUE		R28	100 °C			
Dynamic Shear, kPa (G* · sin δ, 10 rad./sec.)	At Test Temperature	T315	19 °C	16 °C	14.5 °C	13 °C
			5000 max.			
Creep Stiffness, MPa	At Test Temperature	T313	-18 °C	-24 °C	-27 °C	-30 °C
			300 max.			
M-Value	At Test Temperature	T313	0.300 min.			
Direct Tension, % Strain	At Test Temperature	T314	-18 °C	-24 °C	-27 °C	-30 °C
			1.0 min.			
NOTES		1. Requirements in addition to M320 are shown in red.				

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Manitoba		Table 2: Requirements for Penetration-Graded Asphalt Cements											
Property		**Test Method: AASTHO (T), ASTM (D)**	**Requirements by Penetration Grade**										
			120-150 (A)				**150-200 (A)**				**200-300 (A)**			
ORIGINAL													
Flash Point, °C		D92	205min.				205min.				175min.			
Absolute Viscosity, Pa*s Penetration, tenths of mm	60 °C 25 °C	D2171 D5	Note (1)				Note (1)				Note (1)			
			Point	**Abs**	**Visc**	**Pen**	**Point**	**Abs**	**Visc**	**Pen**	**Point**	**Abs**	**Visc**	**Pen**
			M	230	(2300)	150	A	155	(1550)	150	C	50	(500)	200
			N	109	(1090)	150	B	78	(780)	150	D	92	(920)	200
			B	78	(780)	200	C	50	(500)	200	E	45	(450)	300
			A	155	(1550)	200	D	92	(920)	200	F	26.5	(265)	300
Viscosity	60 °C 25 °C	D2170 D5	Note (1)				Note (1)				Note (1)			
			Point	**Abs**	**Visc**	**Pen**	**Point**	**Abs**	**Visc**	**Pen**	**Point**	**Abs**	**Visc**	**Pen**
			M	435	(435)	150	A	360	(360)	150	C	205	(205)	200
			N	305	(305)	150	B	255	(255)	150	D	285	(285)	200
			B	255	(255)	200	C	205	(205)	200	E	205	(205)	300
			A	360	(360)	200	D	285	(285)	200	F	150	(150)	300
Ductility, cm	15.56 °C	D113	-								100			
	25 °C	D113	100								-			
TFO RESIDUE														
Solubility in Trichloroethylene, % by mass, Tests on Residue from Rolling Thin film Oven Test		D2042 D2872	-				99.5 min.							
Ratio of Absolute Viscosity of Residue from Rolling thin film oven to Original Absolute Viscosity, %			4.0 max.											
NOTES		1. The viscosity and penetration must fall within the area bounded by the points stated for each grade as straight lines on a full logarithmic plot (log-log), with the coordinates of the points stated in the table. The asphalt shall be prepared by the refining of petroleum, it shall be uniform and shall not foam when heated to 175C. The temperature at delivery to the site shall be between 135C and 175C.											

TABLE 2 CONTINUED ON PAGE 3

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Property		Test Method: AASTHO (T), ASTM (D)	Requirements by Penetration Grade											
			300-400 (A)				200-300 (B)				300-400 (B)			
ORIGINAL														
Flash Point, °C		D92	175 min.				175 min.				175 min.			
Absolute Viscosity, Pa*s Penetration, tenths of mm	60 °C 25 °C	D2171 D5	Note (1)				Note (1)				Note (1)			
			Point	**Abs**	**Visc**	**Pen**	**Point**	**Abs**	**Visc**	**Pen**	**Point**	**Abs**	**Visc**	**Pen**
			E	45	(450)	300	C	50	(500)	200	F	26.5	(265)	300
			F	26.5	(265)	300	J	30	(300)	200	K	17.5	(175)	300
			G	17	(170)	400	K	17.5	(175)	300	L	12	(120)	400
			H	27	(270)	400	F	27	(270)	300	G	17	(170)	400
Viscosity	60 °C 25 °C	D2170 D5	Note (1)				Note (1)				Note (1)			
			Point	**Abs**	**Visc**	**Pen**	**Point**	**Abs**	**Visc**	**Pen**	**Point**	**Abs**	**Visc**	**Pen**
			E	205	(205)	300	C	205	(205)	200	F	150	(150)	300
			F	150	(150)	300	J	165	(165)	200	K	125	(125)	300
			G	120	(120)	400	K	125	(125)	300	L	102.5	(102.5)	400
			H	165	(165)	400	F	150	(150)	300	G	120	(120)	400
Ductility, cm	15.56 °C	D113	100											
	25 °C	D113	-											
TFO RESIDUE														
Solubility in Trichloroethylene, % by mass, Tests on Residue from Rolling Thin film Oven Test		D2042 D2872	99.5 min.											
Ratio of Absolute Viscosity of Residue from Rolling thin film oven to Original Absolute Viscosity, %			4.0 max.				5.0 max.							
NOTES		1. The viscosity and penetration must fall within the area bounded by the points stated for each grade as straight lines on a full logarithmic plot (log-log), with the coordinates of the points stated in the table. The asphalt shall be prepared by the refining of petroleum, it shall be uniform and shall not foam when heated to 175C. The temperature at delivery to the site shall be between 135C and 175C.												

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