

<b>Province:</b> Ontario	<b>Materials:</b> Performance Graded Asphalt Cement (OPSS.PROV 1101)
<b>Date Last Reviewed:</b> 02-09-2021	<b>Web Address:</b> <a href="http://www.mto.gov.on.ca">www.mto.gov.on.ca</a>
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Asphalt Binder		
	Description	Modified and unmodified asphalt cement
	Exclusions	All 70-28, 70-34, and 64-34 shall not contain more than 0.5% PPA and shall only be used as a catalyst for the purpose of modification with polymers. Other grades of PGAC shall contain no more than 1.0% PPA. All grades shall not contain any orthophosphoric acid. Silicone oil shall be less than 5ppm for all grades of PGAC.

Ontario <sup>Note 1</sup>		Table 1: Requirements for Performance-Graded Asphalt Binders (Note 3)						
Property		Test Method: AASHTO (T), ASTM (D) or other	Requirements by Performance Grade					
			-	52-34	52-40	58-28	58-34	58-40
ORIGINAL								
Flash Point, ° C		T48	230 min.					
Rotational Viscosity, Pa·s	135 °C	T316	3 max.					
Dynamic Shear, kPa (G*/sin δ, 10 rad./sec)	At Grade Temperature	T315	1.00 min.					
Specific Gravity	15.6 °C	T228	Report					
Ash Content		ASTM D8078	-	≤0.60		≤0.40		≤0.60
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 <sub>nr</sub> @ 3.2kPa (kPa <sup>-1</sup> )	Test Temperature (Note 2)	T350	-	< 4.50		-		< 4.50
MSCR, % Recovery @ 3.2kPa, R <sub>3.2</sub> (%)			-	> the lesser of 55 or [(29.371) (J <sub>nr-3.2</sub> )- 0.2633]		-		> the lesser of 55 or [(29.371) (J <sub>nr-3.2</sub> )- 0.2633]
MSCR, % Difference between 0.1kPa and 3.2kPa, J <sub>nrdiff</sub> (%)			Testing carried out for information purposes only.					
TABLE 1 CONTINUED ON PAGE 2								

Disclaimer: "To ensure the most accurate and current information, the specific agency should be contacted."



Property		Test Method: AASTHO (T), ASTM (D) or other	Requirements by Performance Grade					
			-	52-34	52-40	58-28	58-34	58-40
PAV20 RESIDUE		LS-228 Method A	90 °C, 20hrs, 2.10 MPa			100 °C, 20hrs, 2.10 MPa		
Dynamic Shear, kPa ( $G^* \cdot \sin \delta$ , 10 rad./sec.)	At Test Temperature	T315	-	13 °C	10 °C	19 °C	16 °C	13 °C
			5000 max.					
Creep Stiffness, MPa	At Test Temperature	T313	-	-24 °C	-30 °C	-18 °C	-24 °C	-30 °C
			300 max.					
M-Value			0.300 min.					
CTOD ( $\delta_i$ ), mm	15 °C	LS-299	-	≥ 14.0	≥ 18.0	≥ 6.0	≥ 14.0	≥ 18.0
Low Temperature Limiting Grade (LTLG), °C		LS-308	-	≤ -34.0	≤ -37.0	≤ -24.0	≤ -34.0	≤ -37.0
Grade Loss, °C			-	≤ 6.0				
Low Temperature Critical Spread ( $\Delta T_c$ ), °C		LS-320	Testing carried out for information purposes only.					
Cross-Over Temperature ( $T_{645}$ ), °C		LS-319	Testing carried out for information purposes only.					
PAV40 RESIDUE		LS-228 Method C	90 °C, 40hrs, 2.10 MPa			100 °C, 40hrs, 2.10 MPa		
CTOD ( $\delta_i$ ), mm	15 °C	LS-299	Testing carried out for information purposes only.					
Low Temperature Critical Spread ( $\Delta T_c$ ), °C		LS-320	Testing carried out for information purposes only.					
Cross-Over Temperature ( $T_{645}$ ), °C		LS-319	Testing carried out for information purposes only.					
NOTES		1. Applies to Ministry of Transportation Ontario only. Municipalities follow OPSS.MUNI 1101						
		2. Conducted at 52°C for contracts located north of the boundary formed by the French River, Lake Nipissing, and the Mattawa River, excluding Manitoulin Island (also referred to as PGAC Zone 1). Conducted at 58°C for locations South of PGAC Zone 1 in Ontario, including Manitoulin Island (also referred to as PGAC Zones 2 and 3).						
		3. Requirements in addition to M320 are shown in red.						

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Ontario <sup>Note 1</sup>		Table 2: Requirements for Performance-Graded Asphalt Binders (Note 3)						
Property		Test Method: AASHTO (T), ASTM (D) or other	Requirements by Performance Grade					
			64-28	64-34	-	70-28	70-34	-
ORIGINAL								
Flash Point, ° C		T48	230 min.					
Rotational Viscosity, Pa·s	135 °C	T316	3 max.					
Dynamic Shear, kPa (G*/sin δ, 10 rad./sec)	At Grade Temperature	T315	1.00 min.					
Specific Gravity	15.6 °C	T228	Report					
Ash Content, %		ASTM D8078	≤0.60		-	≤0.60		-
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 <sub>nr</sub> @ 3.2kPa (kPa <sup>-1</sup> )	Test Temperature (Note 2)	T350	< 4.50		-	< 4.50		-
MSCR, % Recovery @ 3.2kPa, R <sub>3.2</sub> (%)			> the lesser of 55 or [(29.371) (J <sub>nr-3.2</sub> )-0.2633]		-	> the lesser of 55 or [(29.371) (J <sub>nr-3.2</sub> )-0.2633]		-
MSCR, % Difference between 0.1kPa and 3.2kPa, J <sub>nrdiff</sub> (%)			Testing carried out for information purposes only.					
PAV20 RESIDUE		LS-228 Method A	100° C, 20hrs, 2.10 MPa					
Dynamic Shear, kPa (G* · sin δ, 10 rad./sec.)	At Test Temperature	T315	22 °C	19 °C	-	25 °C	22 °C	-
			5000 max.					
Creep Stiffness, MPa	At Test Temperature	T313	-18 °C	-24 °C	-	-18 °C	-24 °C	-
			300 max.					
M-Value			0.300 min.					
CTOD ( δ <sub>t</sub> ), mm	15 °C	LS-299	≥ 10.0	≥ 14.0	-	≥ 10.0	≥ 14.0	-
Low Temperature Limiting Grade (LTLG), °C		LS-308	≤ -28.0	≤ -34.0	-	≤ -28.0	≤ -34.0	-
Grade Loss, °C			≤ 6.0		-	≤ -6.0		-
Low Temperature Critical Spread (ΔT <sub>c</sub> ), °C		LS-320	Testing carried out for information purposes only.					
Cross-Over Temperature (T <sub>δ45</sub> ), °C		LS-319	Testing carried out for information purposes only.					
TABLE 2 CONTINUED ON PAGE 4								

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Property		Test Method: ASTHO (T), ASTM (D) or other	Requirements by Performance Grade					
			64-28	64-34	-	70-28	70-34	-
PAV40 RESIDUE		LS-228 Method C	100 °C, 40hrs, 2.10 MPa					
CTOD ( $\delta_t$ ), mm	15 °C	LS-299	Testing carried out for information purposes only.					
Low Temperature Critical Spread ( $\Delta T_c$ ), °C		LS-320	Testing carried out for information purposes only.					
Cross-Over Temperature ( $T_{64S}$ ), °C		LS-319	Testing carried out for information purposes only.					
NOTES		1. Applies to Ministry of Transportation Ontario only. Municipalities follow OPSS.MUNI 1101 2. Conducted at 52°C for contracts located north of the boundary formed by the French River, Lake Nipissing, and the Mattawa River, excluding Manitoulin Island (also referred to as PGAC Zone 1). Conducted at 58°C for locations South of PGAC Zone 1 in Ontario, including Manitoulin Island (also referred to as PGAC Zones 2 and 3). 3. Requirements in addition to M320 are shown in red.						