Overview

• Alberta Penetration Viscosity based on Western crudes
  – Requires both Penetration and viscosity values
  – Higher viscosity asphalts lower temperature susceptibility
  – Can be directly correlated to stiffness
  – Is not intuitive

• PG system result of SHRP implemented early-mid 90s
  – Uses complex modulus & stiffness as a direct measure
  – Stiffness/modulus tied directly to in-service temperatures
  – Very Intuitive

• What took so long
  – PG has larger range between grades
  – PG crosses the quality line established in Pen-Visc system

• What does 2012 and beyond look like?
  – Alberta Transportation implementation
Asphalt quality is well documented in Western Canada with many years of historical data.
Bitumen Test Data Chart
(After Heukelom)

Temperature (°C)

Penetration (dmm)

Viscosity (Poise)

-40 25 60 135

T

1,000 100,000

100 10,000

10 1,000

1 100

Government of Alberta
Bitumen Test Data Chart
(After Heukelom)
Relating PI to Stiffness
PG Binder Specifications

- Performance parameters related to in-service temperatures
- Grading in the form PG X-Y
  - $X =$ high temp & $Y =$ low temp
- ie. PG 58-34 for +58 to -34
- More binder selection options
PG Grading of AT “A” Asphalts

<table>
<thead>
<tr>
<th>Low Temperature (°C)</th>
<th>High Temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-46</td>
<td>-40</td>
</tr>
<tr>
<td>-40</td>
<td>-34</td>
</tr>
<tr>
<td>-34</td>
<td>-28</td>
</tr>
<tr>
<td>-28</td>
<td>-22</td>
</tr>
</tbody>
</table>

- **Modified Asphalts**
- **“B” & “C” Crudes**
Draft Version of AT PG Asphalts
(Circa 2003)

<table>
<thead>
<tr>
<th>AT Pen-Visc Grades</th>
<th>Equivalent PG Asphalt</th>
</tr>
</thead>
<tbody>
<tr>
<td>80-100A</td>
<td>PG 64-28</td>
</tr>
<tr>
<td>120-150A &amp; 150-200A</td>
<td>PG 58-?? with “Plus” criteria</td>
</tr>
<tr>
<td>200-300A</td>
<td>PG 52-34</td>
</tr>
<tr>
<td>300-400A</td>
<td>PG 46-37</td>
</tr>
</tbody>
</table>
Update to Asphalt Specifications

Construction Bulletin for Transition

Supplier Pre-Qualification Requirements
Alberta Transportation
Transition to PG Asphalt

<table>
<thead>
<tr>
<th>AT Specified Penetration Grade</th>
<th>Corresponding AT PGAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>80-100A</td>
<td>PG 64-28¹</td>
</tr>
<tr>
<td>120-150A &amp; 150-200A</td>
<td>PG 58-28²</td>
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<tr>
<td>200-300A</td>
<td>PG 52-34</td>
</tr>
<tr>
<td>300-400A</td>
<td>PG 46-34²</td>
</tr>
</tbody>
</table>

Notes

1. For the PG 64-28 designation only, an acceptance tolerance of 1°C will be allowed for either the high temperature rating or the low temperature rating but not both tolerances together. No tolerance will be allowed for other designated grades.

2. Suppliers of these PG grades will need to meet additional “quality stipulations” prior to receiving approval for listing on the Products List.
   - For the PG 58-28 designation the Department will not pre-qualify an asphalt product which grades to a low temperature warmer than -30°C.
   - For the PG 46-34 designation the Department will not pre-qualify an asphalt product which grades to a low temperature warmer than -37°C.
Low Temperature Grades Based on TAC Model @98%
High Temperature Grades Based on LTPP Model @98%
Lamont Test Road
300-400A (~PG 46-37)
Lamont Test Road
150-200A (~PG58-31)
Lamont Test Road
80-100C (~PG52-22)