

CANADIAN ASPHALT MIX EXCHANGE HISTORICAL DATA

| Test | | Average | S _x | S _r | S _R | Average | S _x | S _r | S _R | Average | S _x | S _r | S _R | Average | S _x | S _r | S _R | Average | S _x | S _r | S _R |
|--|------------------------|--------------------------|----------------|----------------|----------------|--------------------------|----------------|----------------|----------------|--------------------------|----------------|----------------|----------------|--------------------------|----------------|----------------|----------------|--------------------------|----------------|----------------|----------------|
| | | Marshall Mix 1996 | | | | Marshall Mix 1997 | | | | Marshall Mix 1998 | | | | Marshall Mix 1999 | | | | Marshall Mix 2000 | | | |
| Bulk Density of Aggregates (g/cm ³) | B.D.Coarse Aggregate | 2.658 | 0.013 | 0.007 | 0.014 | 2.658 | 0.013 | 0.005 | 0.014 | 2.662 | 0.009 | 0.005 | 0.010 | 2.661 | 0.016 | 0.006 | 0.017 | 2.669 | 0.009 | 0.0070 | 0.011 |
| | B.D. Fine Aggregate | 2.629 | 0.016 | 0.006 | 0.016 | 2.628 | 0.016 | 0.005 | 0.017 | 2.620 | 0.014 | 0.005 | 0.015 | 2.627 | 0.019 | 0.007 | 0.020 | 2.642 | 0.011 | 0.0138 | 0.016 |
| Water Absorption (%) | W.A. Fine Aggregate | 1.128 | 0.150 | 0.091 | 0.168 | 1.098 | 0.165 | 0.071 | 0.174 | 1.236 | 0.155 | 0.074 | 0.166 | 1.170 | 0.260 | 0.091 | 0.270 | 0.923 | 0.16 | 0.126 | 0.19 |
| | W.A. Coarse Aggregate | 1.095 | 0.122 | 0.060 | 0.132 | 1.094 | 0.160 | 0.053 | 0.166 | 1.051 | 0.099 | 0.063 | 0.112 | 1.097 | 0.091 | 0.055 | 0.101 | 1.209 | 0.15 | 0.064 | 0.16 |
| Theor. Max. Specific Gravity & Density | Regular MTD | 2.473 | 0.008 | 0.004 | 0.009 | 2.469 | 0.010 | 0.005 | 0.011 | 2.471 | 0.009 | 0.004 | 0.009 | 2.472 | 0.011 | 0.005 | 0.012 | 2.480 | 0.0142 | 0.0039 | 0.0145 |
| | Modified Rice | 2.485 | 0.007 | 0.004 | 0.008 | 2.482 | 0.008 | 0.005 | 0.009 | 2.483 | 0.009 | 0.004 | 0.009 | 2.484 | 0.008 | 0.004 | 0.008 | 2.490 | 0.0170 | 0.0039 | 0.0173 |
| Bulk Density (g/cm ³) | B.D. Hand Compaction | 2.393 | 0.012 | 0.005 | 0.013 | 2.398 | 0.014 | 0.005 | 0.014 | 2.373 | 0.015 | 0.007 | 0.016 | 2.379 | 0.013 | 0.006 | 0.014 | 2.382 | 0.012 | 0.0050 | 0.013 |
| | B.D. Mech. Compaction | 2.392 | 0.013 | 0.007 | 0.014 | 2.396 | 0.013 | 0.005 | 0.014 | 2.374 | 0.016 | 0.006 | 0.016 | 2.376 | 0.014 | 0.006 | 0.015 | 2.381 | 0.015 | 0.0050 | 0.016 |
| Marshall Stability (kN) | Stab. Hand Compaction | 8.228 | 1.581 | 0.681 | 1.688 | 8.568 | 1.875 | 0.592 | 1.944 | 7.651 | 1.443 | 0.583 | 1.529 | 8.328 | 1.621 | 0.826 | 1.771 | 6.835 | 1.6 | 0.55 | 1.7 |
| | Stab. Mech. Compaction | 8.051 | 1.338 | 0.573 | 1.427 | 8.617 | 1.720 | 0.731 | 1.832 | 7.480 | 1.236 | 0.473 | 1.302 | 7.936 | 1.386 | 0.485 | 1.449 | 6.472 | 1.5 | 0.52 | 1.6 |
| Flow (mm) | Flow Hand Compaction | 2.3 | 0.5 | 0.2 | 0.5 | 2.4 | 0.6 | 0.3 | 0.6 | 2.2 | 0.4 | 0.2 | 0.4 | 2.1 | 0.4 | 0.2 | 0.5 | 2.0 | 0.75 | 0.20 | 0.77 |
| | Flow Mech. Compaction | 2.2 | 0.5 | 0.2 | 0.5 | 2.3 | 0.5 | 0.2 | 0.5 | 2.1 | 0.4 | 0.2 | 0.5 | 2.0 | 0.4 | 0.1 | 0.4 | 1.9 | 0.45 | 0.16 | 0.47 |
| VMA (%) | VMA Hand Compaction | 14.3 | 0.6 | 0.2 | 0.6 | 14.1 | 0.5 | 0.2 | 0.6 | 14.9 | 0.7 | 0.2 | 0.7 | 14.8 | 0.8 | 0.2 | 0.8 | 14.9 | 0.45 | 0.18 | 0.48 |
| | VMA Mech. Compaction | 14.4 | 0.6 | 0.2 | 0.7 | 14.2 | 0.5 | 0.2 | 0.5 | 14.9 | 0.7 | 0.2 | 0.7 | 14.9 | 0.6 | 0.2 | 0.6 | 14.9 | 0.52 | 0.18 | 0.54 |
| Air Voids (%) | AV Hand Compaction | 3.3 | 0.6 | 0.2 | 0.6 | 2.9 | 0.6 | 0.2 | 0.6 | 4.0 | 0.6 | 0.3 | 0.6 | 3.8 | 0.5 | 0.2 | 0.6 | 3.9 | 0.69 | 0.20 | 0.72 |
| | AV Mech. Compaction | 3.3 | 0.5 | 0.3 | 0.6 | 3.0 | 0.6 | 0.2 | 0.6 | 4.0 | 0.6 | 0.2 | 0.7 | 3.8 | 0.6 | 0.3 | 0.6 | 3.9 | 0.71 | 0.20 | 0.73 |
| Voids Filled With Asphalt (%) | VF Hand Compaction | 77.0 | 3.4 | 1.2 | 3.6 | 79.5 | 3.9 | 1.3 | 4.0 | 73.3 | 3.1 | 1.4 | 3.3 | 74.5 | 3.2 | 1.3 | 3.4 | 73.8 | 4.3 | 1.0 | 4.3 |
| | VF Mech. Compaction | 76.9 | 3.0 | 1.5 | 3.3 | 79.2 | 3.8 | 1.3 | 3.9 | 73.3 | 3.4 | 1.2 | 3.6 | 74.8 | 3.6 | 1.4 | 3.8 | 73.8 | 4.2 | 1.1 | 4.3 |
| | | Gyratory Compaction 1996 | | | | Gyratory Compaction 1997 | | | | Gyratory Compaction 1998 | | | | Gyratory Compaction 1999 | | | | Gyratory Compaction 2000 | | | |
| Bulk Density (g/cm ³) | 134 Gyration | 2.418 | 0.016 | 0.005 | 0.016 | 2.419 | 0.016 | 0.008 | 0.018 | 2.400 | 0.022 | 0.006 | 0.022 | 2.416 | 0.013 | 0.005 | 0.014 | 2.414 | 0.016 | 0.0045 | 0.016 |
| | 86 Gyration | 2.397 | 0.017 | 0.005 | 0.017 | 2.399 | 0.016 | 0.008 | 0.017 | 2.377 | 0.025 | 0.010 | 0.026 | 2.395 | 0.014 | 0.006 | 0.014 | 2.393 | 0.017 | 0.0049 | 0.018 |
| | 7 Gyration | | | | | | | | | | | | | | | | | 2.238 | 0.026 | 0.0058 | 0.027 |
| Air Voids (%) | 86 Gyration | 3.9 | 0.7 | 0.2 | 0.7 | 3.8 | 0.7 | 0.3 | 0.8 | 4.8 | 1.0 | 0.4 | 1.1 | 4.0 | 0.6 | 0.3 | 0.6 | 4.25 | 0.69 | 0.20 | 0.71 |
| VMA (%) | 86 Gyration | 13.5 | 0.5 | 0.2 | 0.6 | 13.6 | 0.5 | 0.3 | 0.6 | 14.2 | 0.9 | 0.3 | 0.9 | 13.7 | 0.5 | 0.2 | 0.6 | 14.3 | 0.63 | 0.18 | 0.65 |
| Voids Filled (%) | 86 Gyration | 72.2 | 2.9 | 1.3 | 3.1 | 72.1 | 4.0 | 1.8 | 4.3 | 66.9 | 5.2 | 1.7 | 5.4 | 71.2 | 3.1 | 1.1 | 3.2 | 70.4 | 4.0 | 1.1 | 4.1 |
| | | | | | | | | | | Ignition Oven 1998 | | | | Ignition Oven 1999 | | | | Ignition Oven 2000 | | | |
| Asphalt Content (%) | By Mass of Oven-Dry | | | | | | | | | 5.4 | 0.2 | 0.1 | 0.2 | 5.3 | 0.1 | 0.1 | 0.1 | 5.1 | 0.055 | 0.075 | 0.083 |

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| Legend: |
| S _x = Standard Deviation |
| S _r = Repeatability Standard Deviation |
| S _R = Reproducibility Standard Deviation |

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