

Lime in Asphalt

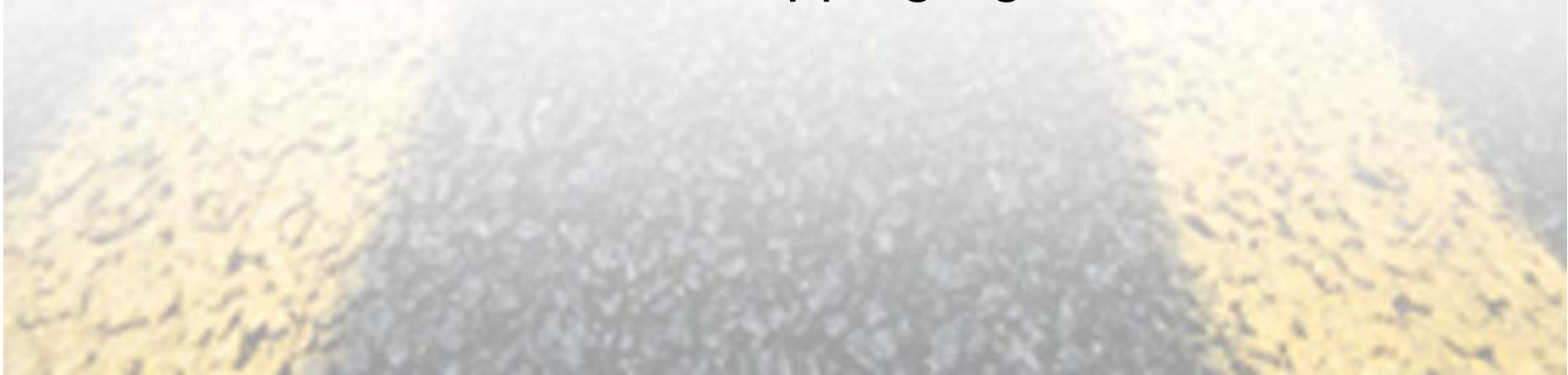
Not Just a Filler

Hydrated Lime is an Active Ingredient in Asphalt Mixes and provides **Added Value**

Benefits of Lime in Asphalt

Hydrated Lime (HL) provides a host of benefits

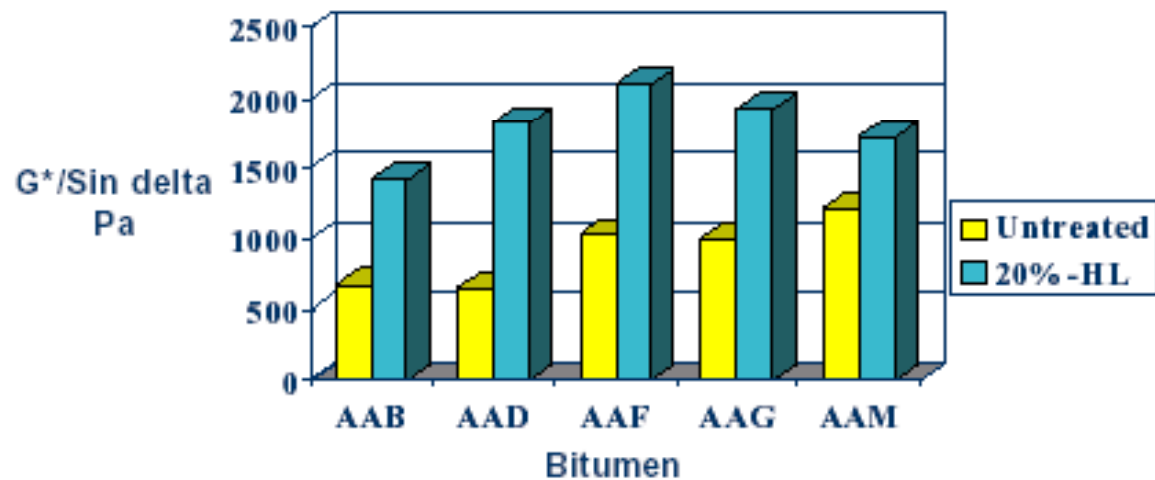
- Reduced Rutting
- Slower Aging Rate
- Reduced Cracking due to Fatigue
- Excellent Anti-Stripping Agent



Rutting Prevention in HMA

Improved Bitumen Stiffness

The addition of 1.0% to 1.5% Hydrated Lime (HL) to Asphalt mixes results in a marked improvement in rutting resistance.

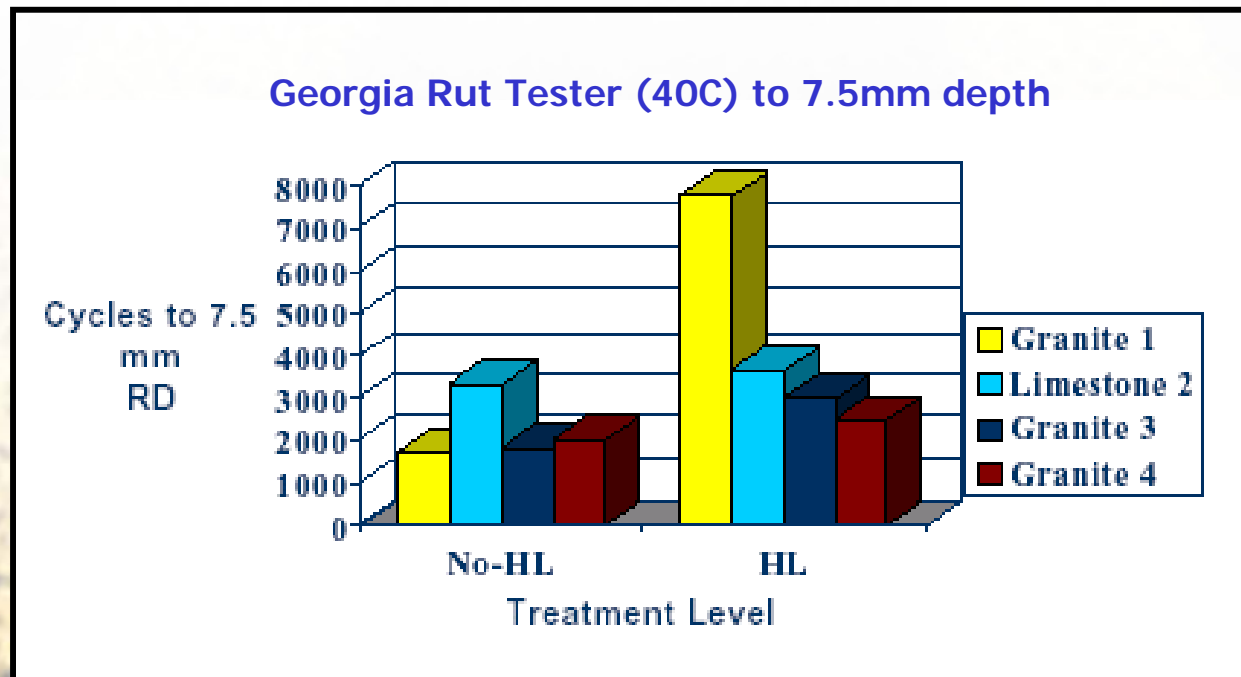


This graph shows the change in $G^*/\sin \delta$ across five SHRP bitumens by modifying them with 20% hydrated lime (equivalent to 1 – 1.5% HL in the HMA)

Rutting Prevention in HMA

Results of Rut Testing

Rut test results on four different aggregates further demonstrate the effect of adding Hydrated Lime (HL) to the asphalt mix

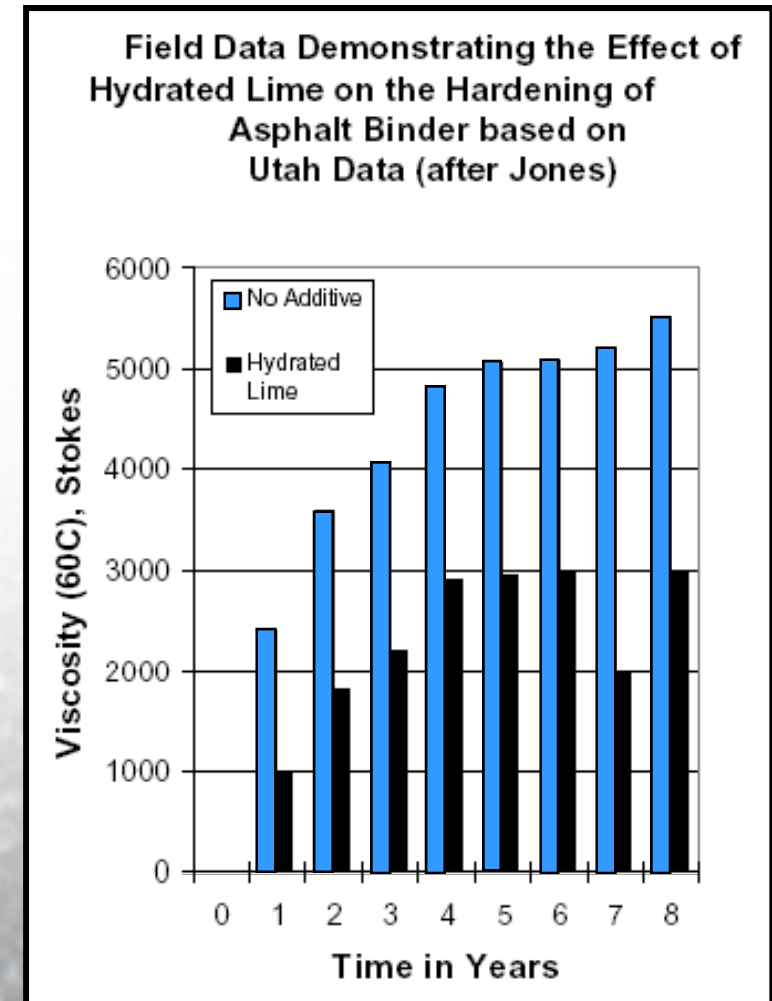


Reduce Oxidation and Aging Rate

Impact of HL on Oxidative Hardening of Bitumen

Physiochemical interactions between Hydrated Lime and bitumen reduce the susceptibility of the bitumen to oxidative deterioration

Reduced Cracking of the Asphalt surface is obtained as the bitumen remains more ductile

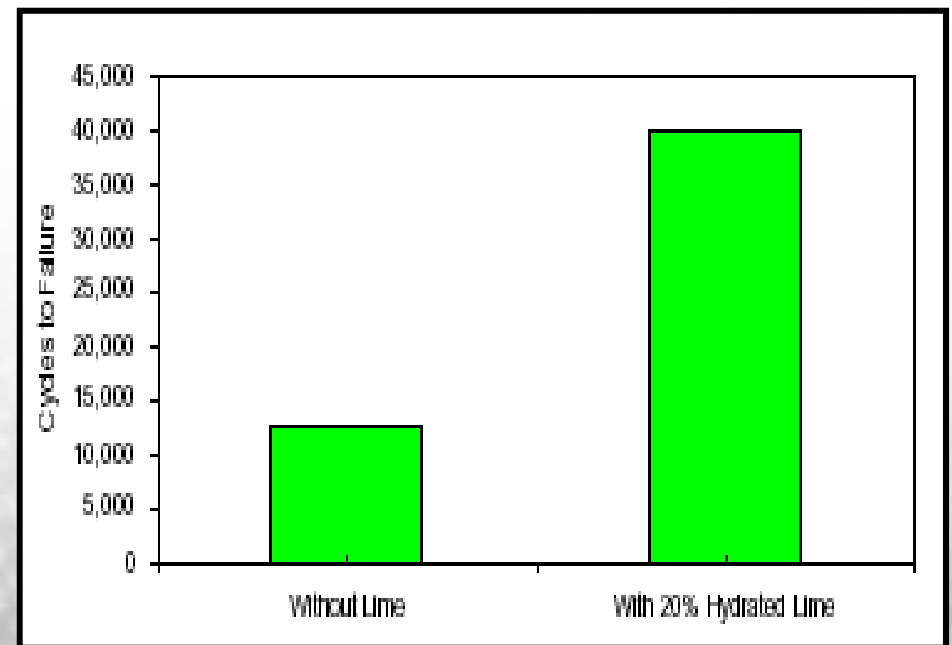


Less Cracking due to Fatigue

HL effect on Bitumen chemistry improves cyclic tensile loading performance

Results of cyclic tensile fatigue testing of HMA samples. A significant improvement in performance is evident in the HL treated mixtures.

Results of fatigue testing on dense-graded mixtures of crushed limestone aggregate and two SHRP bitumens. Samples aged before testing. 20% HL equivalent to 1% in a typical HMA mix



Hydrated Lime is the best Anti-Stripping Agent

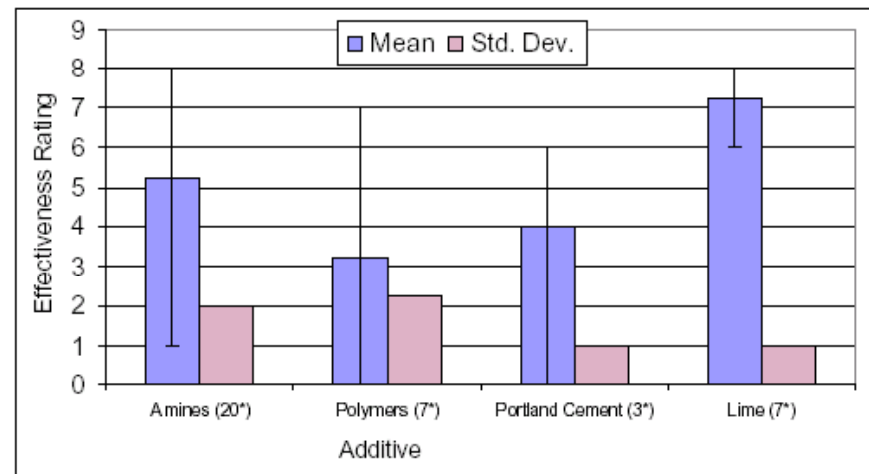
Substantially Decreases Moisture Damage

Aggregate properties tend to dominate when it comes moisture susceptibility, which is a prime culprit in stripping of HMA.

Lime interaction at the aggregate surface enhances the bitumen-aggregate bond.

Hydrated Lime outperforms all other types of anti-strip agents in ASTM tests.

Relative Effectiveness of Additives in Reducing Moisture Damage Susceptibility



Financial Benefit of Lime in Asphalt Mixes from Longer Life

Include 1-1.5%
Hydrated Lime in
Asphalt mix design

**Gain the following
operational benefits:**

- Reduced Rutting
- Slower Aging due to Oxidation
- Reduced Cracking due to Fatigue
- Excellent Anti-Stripping Agent

**Lower your
Life-Cycle Cost**
Save \$\$\$ in
Maintenance, Repair,
and Replacement Costs

Lime is for Everyone

The Designer

Proven Technology – Excellent performance record
Best use of in-place materials – Ecologically preferred
Very cost efficient – More roads for the same budget!

The Builder

Proven Technology – Excellent performance record
Easy to use and readily available
Helps keep the job moving – removes water and clay problems
Very cost efficient – More roads for the same budget!