

Industrial Resources Council Sustainable Roadway Materials GTR In Liquid Asphalt

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Introduction

-Asphalt Binders are certified or "Graded" based on Temperature.

Example: **PG 64-22**

PG: Performance Grade

64: upper temperature specification in Degrees C

-22: lower temperature specification in Degrees C

Typical NCDOT Paving grades include: PG58-28, PG64-22, PG70-22, PG 76-22

Higher Grade= More Viscous, used in higher traffic volume applications

Higher Grades (PG76-22) are achieved by adding polymers and modifiers, resulting in higher Costs

Overview

- Use Ground Tire Rubber in Place of Polymer to produce PG 76-22 GTR for SCDOT
- Project was on Interstate 77, placed during 2011 & 2012 paving seasons
- Consisted of 4500 liquid tons of PG 76-22 GTR

Method

- Terminal blend of base PG 64-22 and GTR by the wet method of blending at our Healing Springs, NC Terminal.
- Deliver to HMA plant two and half hours away

Materials

1. Base asphalt PG –selective of asphalt base to be used- chose PG 67-22
2. GTR- contains fibers, polymers, and elastomers used in conventional asphalt modification

30 mesh from Liberty Tire Recycling- gradation spec
Free of metal, deleterious materials, oversized rubber particles.
Ambient Grind: no cryogenic material
Passenger tire only: no aviation or equipment tires
3. Stabilizing additive- minimal percent of GTR

Production

- Base asphalt bulk stored on site at the terminal ready for blending



- GTR delivered to terminal in 2000 pound bulk sacks on covered trailers
– CofA for each shipment from grinder



- GTR is added to base asphalt in the mixing tank at elevated temperature along with stabilizing additive at proper proportions
- GTR is allowed to “wet” and mix until uniform.

- PG 76-22 GTR is pumped to holding tanks where it is held until ready to load in tanker for delivery to HMA plant.
- QC testing is preformed at this point.



Quality Control

- Liquid asphalt base
 - Start with M320 certified PG 64-22-verified by independent lab.
 - True graded 67-22- provides consistent starting point for formulations

- GTR delivered with CofA for each shipment
 - Free of deleterious materials, metal, trash- visual inspection
 - Gradation report: No 16, No 30, No 40, No 50, No 80 sieves- samples taken to confirm CofA's
 - Passenger tires only: no off road or aviation tires
 - Ambient grind only- no cryogenic material

Testing

- Daily testing from holding tanks of PG 76-22 GTR- DSR machine onsite
- Retain samples from tanks
- Monthly M320 certifications to verify process
- Split samples with SCDOT

Issues

- Product must be agitated at terminal and HMA plant site to prevent settling of GTR.
- PG 76-22 GTR samples must be stirred prior to testing to obtain accurate results
- Moisture in GTR- excessive foaming in mixing tanks
- GTR production must be scaled to meet HMA plant demands, challenge to store bulk, must be made as needed.

Significance

- Recycled material: GTR used to displace 10% of liquid asphalt binder in PG 76-22 GTR.
- Every two tons of HMA placed using PG 76-22 GTR=1 tire recycled
- Project:
 - 4,500 tons of PG 76-22 GTR
 - ~90,000 tons HMA = 45,000 TIRES RECYCLED

Cost Savings

- Elevated polymer prices and shortage
- Savings to contractor and department

QUESTIONS?

Contact Information

If you have any questions please contact

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