

Shingles in Asphalt

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Recycled Shingles



Shingle Usage

- Past – manufacturers' waste
 - Uniform
 - Somewhat softer asphalt
- Today – tear-off shingle (TOS) use increasing
 - Higher binder content (loss of aggregate)
 - Contamination?
 - Asbestos?

Why Use Shingles?

- Very high binder contents
 - Up to ~30% binder depending on type
 - Very stiff binder
 - Reduced rutting potential but what about cracking?
- High quality mineral filler and sand
- Fibers – can reinforce the mix like polypropylene or polyester fibers
 - May lessen cracking problems from stiff binder

HMA Recycling ETG

- Formed in 2006
- Purpose – Coordinate, develop national guidance and recommendations on RAP use
- Goal – encourage all states to allow 15-20% RAP, then increase some to 25-30%
- Demo projects, document performance, share info, best practices, research
- Added RAS to scope in 2010 – similar to RAP
- www.morerap.us

Handling Shingles in the Lab

- Dry the ground shingles
- Store at room temperature
- Batch aggregates into bowl, add RAP, put shingles on top and heat to mixing temp
- Add binder and mix
- Short term condition

- Wear gloves!

Blending of RAS?

- Can't construct blending chart like with RAP
- RAS binder too stiff
 - Exceeds capacity of DSR and BBR
- One solution
 - Blend RAS binder 50-50 with virgin then construct blending chart
 - Advanced Asphalt Technologies

AAT Research

- 25% RAS binder
 - Low temp grade is one increment (6°) warmer
 - Intermediate temp grade is 3° higher (1 step)
 - High temp grade is 2 grades (12°) higher
- Carefully consider virgin binder grade
- RAS binder can blend to a high degree with RAP and virgin binders

Handling Shingles at the Plant

- Keep dry
- Pre-mix with RAP or sand to reduce clumping
- Best not to store too long (~2 weeks)
- Batch plant – introduce in weigh hopper or boot of hot elevator
- Drum plant – feed through recycle collar

Illinois Tollway Research

- Tollway evaluated FRAP, RAS and FRAP+RAS
- 2009
- Performance was good in lab and field
- Now using shingles extensively

Other Research

- Shingles Pooled Fund Study
 - Iowa State University
 - Should be available soon
- Additional work proposed
 - RAP ETG to AASHTO SOM
- Research and field experience is growing and will continue to grow.

Usage Increasing

- Many states/provinces are now using
 - Minnesota, Missouri, Indiana, and others
- Once they start using, seems to increase rapidly
- No major problems reported yet.