00730 Emulsified Asphalt Tack Coat

Tack Bonding
Ultimate Goal – To produce uniform, complete, and adequate tack coverage to bond asphalt pavements to better resist shear stresses.

Section 00730.11 – Dilution of tack coat material (adding additional water) may be allowed up to a maximum 1:1 ratio with Engineer approval.

Bonded Demonstration

Poorly Bonded Asphalt Pavements
• Reduce fatigue life
• 10% bond loss = approximate 50% less fatigue life
• No bond = approximate 60 to 75% loss of pavement life
• Increase slippage and shoving
• Can be difficult to compact

Resources
• 2015 Oregon Standard Specifications for Construction
• Best Practices for Emulsion Tack Coats, NAPA 2013

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Controls to Minimize Tracking of Emulsified Tack

- Minimize construction vehicle traffic especially when tack is breaking
- Prior to tack application, make sure all surfaces are clean especially with grinding operations
- Apply evenly across surface
- Dilute asphalt emulsions
- Use alternate approved asphalt emulsion (CSS-1H)
- Contact the asphalt emulsion supplier for other methods

Asphalt Emulsion (Tack) Breaking and Setting

- Look for the color to change: brown to black
- Supplier can adjust tack formulation to increase/decrease set time if needed
- Variables that may affect break time
  - Weather (damp weather will delay set time)
  - Uniformity of tack coat (pooled tack will set slower)
  - Type of tack (softer tacks will set slower)
  - Initial temperature of tack (lower tack temperature will delay set time)
  - Ambient temperature (cooler temperatures will delay set time)

Sampling and Handling of Asphalt Emulsions

- Sample undiluted asphalt emulsions
- Use non-metallic containers for the sample storage
- Keep sample out of direct sunlight
- Do not excessively jostle or disturb sample
- Deliver to the ODOT materials laboratory as soon as possible
- Material should be tested within 30 days of sampling

Spec Notes are prepared for inspectors by the Construction Quality Assurance Unit to provide background information around design elements and specifications. For additional Spec Notes, visit us at http://www.oregon.gov/ODOT/HWY/CONSTRUCTION/Pages/QAIndex.aspx.

If you have an idea for a Spec Notes topic, please e-mail us at ODOTConstructionTraining@odot.state.or.us or contact us at 503.986.5453.

Construction vehicle traffic on tack

- Minimize construction vehicle traffic as much as possible.
- Stagger vehicle traffic to minimize tack pick up
- Best to allow tack to set completely (all water evaporated) before allowing construction vehicle traffic on tack
- May allow construction vehicle traffic on fresh non-breaking tack coat though equipment may have slippage or traction issues
- Avoid all traffic while tack is breaking or in a flocculant state where the water is evaporating away from the asphalt

Tack Yield Calculations

Multiply shot rate (gals/yd$^2$) by binder ratio (typically 2/3 or 1/3) to get residual rate

Mass Method (recommended for full load applications)
Length X Width (feet) of area covered = Area
Net weight of tack used X Gallon conversion$^1$ = Gallons
Gallons + Area ÷ 9 (convert to square yards) = gals/yd$^2$

Volume Method
Length X Width (feet) of area covered = Area
Gallons of tack applied X 60° F conversion Factor$^2$ = Gallons
Gallons + Area ÷ 9 (convert to square yards) = gals/yd$^2$

Temperature Volume Correction for Emulsified Asphalt$^3$

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<th>Temperature (°F)</th>
<th>Volume Factor</th>
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$^1$ gallon conversion on tack bill of lading

$^2$ see attached temperature volume correction chart for multiplier

$^3$ Interpolate correction values for temperatures not shown