Factors that Influence the Quality of Tack Coat Application

- Calibrated Equipment
- Correct Nozzle Size
- Proper Equipment Maintenance
- Appropriate Application Rate
- Tack Material Selection
- Cleaning the Surface for Application
- Uniform Material Distribution
- Proper Break/Cure Time
- Don’t Forget the Joints!

Calibrated Equipment

- Tack distributor trucks should be calibrated periodically to ensure that the actual applied rate is close to the rate selected by the controls.
- A good way to verify the accuracy of the control system is to use a measuring stick to determine the level of material in the tank before and after application. The measuring stick must be calibrated to a specific distributor tank.

*Note: The Truck must be on a level surface!*

Calibrated Equipment

- The best way to calibrate a tack distributor is to measure the amount of material applied to pads of a known area and mass.
- ASTM D-2995 is a test standard that describes this process.
Tack Coat Best Practices

Correct Nozzle Size

- Distributor trucks are capable of applying a variety of materials over a wide range of rates. This flexibility is made possible by utilizing spray nozzles with different size openings.
- To ensure a sufficient amount of pressure is built-up in the spray system, the nozzle must match the opening size and viscosity of the material being applied. In general, the smaller the opening, the greater the pressure.

Proper Equipment Maintenance

- Nozzles must be clean/unclogged and should be adjusted to the proper angle.
- The height of the spray bar should be approximately 12” above the surface.
- If equipped with one, the material strainer should be checked daily and cleaned if necessary.

Appropriate Application Rate

- Not all surfaces need the same amount of tack applied to ensure a proper bond. The application rate specified on a set of project plans is a good initial target, but the final rate should be determined by placing a tack coat test strip at the beginning of the job, in accordance with TDOT spec section 403.05.b.

TDOT Spec 403.05.b:

For the test strip, apply the tack material at a rate between 0.05 and 0.10 gallons of applied emulsion per square yard. If placing the bituminous material upon a milled surface, apply the tack material at a rate between 0.08 and 0.15 gallons of applied emulsion per square yard...
Tack Coat Best Practices

Tack Material Selection

- TDOT permits the use of several emulsified asphalt materials as tack coats. Refer to section 403.02 of TDOT’s specs for the official list.

<table>
<thead>
<tr>
<th>Material</th>
<th>Temperature Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS-1, SS-1h, CSS-1, TST-1P, CQS-1h, CQS-1h, and CSS-1h</td>
<td>60 to 140 °F</td>
</tr>
<tr>
<td>TTT-1</td>
<td>160 to 180 °F</td>
</tr>
<tr>
<td>TTT-2</td>
<td>120 to 160 °F</td>
</tr>
</tbody>
</table>

Cleaning the Surface

- Sweeping the substrate is critical prior to tack coating. Dust or debris on the surface will prevent the emulsion from bonding to the substrate pavement.
- In cases where there is a significant amount of very fine dust, such as a milled surface that has been left open to traffic, a vacuum sweeper may be required to prevent tack from sticking to equipment tires.

Uniform Distribution of Material

- To ensure a proper bond, material must be applied evenly across the entire surface. Streaks are to be avoided.
- Adjustments to the pattern of nozzles or to the height of the spray bar may need to be made in order to distribute the material evenly.
**TDOT Spec 403.05.b:**

*In all cases, ensure that the application will result in a minimum double overlap of the actual tack spray as it lands on the surface. Adjustment of the spray-bar and the nozzles may be necessary to achieve this minimum double overlap. Corn-rows or any other pattern that would result in less than double overlap coverage of the tack coat are not acceptable for the tack application.*

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**Proper Break/Cure Time**

- When first applied as tack coat, emulsion is brown in color – indicating that it is still in emulsified form.
- **Break:** When the emulsion changes from brown to black, the emulsion has “broken” or the asphalt binder particles have separated from the water and coalesced.
- **Set:** When all of the water has evaporated, the emulsion has “set,” and all that is left is asphalt binder. *Tack needs to be DRY prior to paving.*

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**Don’t Forget the Joints**

- TDOT spec 407.16 requires that tack be applied to both longitudinal and transverse joints.
- **Per TDOT Spec. 407.10:** *The contractor must paint contact surfaces of curbing, gutters, manholes, and other structures with a thin, uniform coating of bituminous material before placing the mixture against them.*
- This can be accomplished by using a specially-aimed nozzle or by applying by hand with a spray wand.