WarmGrip N1 is an asphalt additive that allows for easier field compaction and stronger adhesion of the asphalt binder to aggregate. It safeguards pavements against destructive forces such as traffic loading, water intrusion and oxidation, leading to reduced pothole formation, cracking and rutting for safer, smoother and longer-lasting roads. WarmGrip N1 is formulated to minimize smoke and odor for better plant personnel and paving crew comfort, and is used to design mixes that conform to typical specifications including AASHTO T283: Method of Test for Resistance of Compacted Bituminous Mixture to Moisture Induced Damage, AASHTO T324: Method of Test for Hamburg Wheel-Track Testing of Compacted Hot Mix Asphalt (HMA) and AASHTO R35: Standard Practice for Superpave Volumetric Design.

**APPLICATIONS**

Asphalt Paving

**FEATURES**

**EASIER FIELD COMPACTION**
Enables increased mat density with fewer roller passes, even with high recycled asphalt pavement (RAP) mixes

**RELIABLE ANTI-STRIPING EFFECTIVENESS**
Passes tensile strength ratio (TSR) and Hamburg Wheel Tracking tests with wide variety of asphalt and aggregate combinations

**LOW ODOR AND LOW SMOKE**
Improves plant personnel and paving crew comfort

**BETTER MIX WORKABILITY**
Enables easier hand-work in paving applications

**HEAT STABILITY**
Remains effective several weeks in hot asphalt

**COMPATIBILITY**

**ASPHALT**
Compatible with most asphalts including those modified with styrene-butadiene-styrene (SBS), styrene-butadiene rubber (SBR), ethylene-vinyl acetate (EVA) polymers, ground tire rubber (GTR) and recycled asphalt shingles (RAS)

**AGGREGATES**
Compatible with various aggregate types including granite, diabase, diorite, basalt, gabbro, rhyolite, andesite, dacite, chert, quartzite, gneiss, limestone, dolomite, marble, sandstone, natural sand and gravel, slag and RAP
OPTIONS FOR ADDING WARMGRIP N1 TO ASPHALT:
1. Add to asphalt storage tank and agitate mechanically or through pump circulation
2. Add at asphalt terminal by injecting into asphalt line as transport tanker is being charged
3. Add at asphalt mix plant by in-line injecting into the asphalt line (continuous plant) or weigh hopper (batch plant)

NEAT AND MODIFIED ASPHALTS:
- 0.25 – 0.75% by weight of total asphalt in mix
- Usage rate should be determined by user based on degree of aggregate coating and moisture sensitivity testing at desired production temperature

USAGE RECOMMENDATIONS

PHYSICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance, 25 °C</td>
<td>Dark Colored Liquid</td>
</tr>
<tr>
<td>Odor</td>
<td>Amine</td>
</tr>
<tr>
<td>Density, 25 °C</td>
<td>1.0 kg/L</td>
</tr>
<tr>
<td>Viscosity, 25 °C</td>
<td>1,650 cP</td>
</tr>
<tr>
<td>TSCA Inventory</td>
<td>Listed</td>
</tr>
<tr>
<td>C.A.S. Number</td>
<td>Proprietary</td>
</tr>
</tbody>
</table>

The density and viscosity data reported are typical and not specifications. Typical ranges for density and viscosity values are ± 2 and ± 20%.

HANDLING AND STORAGE
Always handle WarmGrip N1 in accordance with Safety Data Sheet (SDS) and Road Science Asphalt Additives Handling and Storage Guidelines document. Avoid product contamination with other materials. Do not store product in excess of 60 °C for prolonged periods. Recommended product handling temperature range is 27 – 50 °C.

AVAILABILITY
WarmGrip N1 is available outside of the US only.
WarmGrip N1 is available for shipment in bulk by rail car and tank truck. Packaged quantities are available in 1,000 L IBC totes (952.5 kg net weight) and 208 L steel drums (190.5 kg net weight).

TECHNICAL SUPPORT
To request additional product information, contact your regional Road Science representative.
You can also contact us at +1-918-960-3800 or customerservice@roadscience.net, or visit our website at www.roadscience.net.

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