WARMGRIP®
Asphalt Mix Performance-Improving Additives

COMPACATION AID COMBINED WITH INDUSTRY’S LEADING & MOST TRUSTED ADHESION PROMOTERS

In order to grow commerce and ensure ease of travel, businesses and the motoring public expect government agencies, asphalt producers and contractors to build safer, long-lasting roads faster. WarmGrip additives facilitate faster paving and extend pavement life by enabling easier field compaction and safeguarding against destructive pavement distresses such as raveling, rutting and pothole formation. The result is more efficient paving, and safer, smoother and longer-lasting roads for years to come.

The WarmGrip additive line provides different feature options based on specific customer needs. All WarmGrip products are cost-effective versus other adhesion promoting technologies and are easy to work with. Low-odor and odorless options are available to reduce odor and smoke typical of competing additives that can be problematic for environmental, health and safety regulatory compliance. These options also promote better plant personnel and paving crew comfort.

BENEFITS

- **FASTER AND EASIER PAVING**
  - Makes field compaction easier enabling improved mat density with fewer roller passes, even with high recycled asphalt pavement (RAP) mixes
  - Improves mix workability and enables easier hand-work

- **IMPROVED PROFITABILITY**
  - Extends paving season and lengthens haul distance
  - Facilitates utilization of increased amounts of RAP and recycled asphalt shingles (RAS)

- **LONGER-LASTING ROADS**
  - Extends pavement life by guarding against stripping and moisture damage caused distresses

- **SAFER, SMOOTHER ROADS**
  - Makes pavements safer by protecting against accidents caused by disruptive pavement ruts and potholes
  - Produces smoother pavements for improved ride quality

- **IMPROVED WORKER COMFORT**
  - Low-odor and odorless options available for improved plant personnel and paving crew comfort
MARKET APPLICATIONS

ASPHALT PAVING USING:
- Non-modified asphalts
- Modified asphalts including those modified with:
  - Styrene-butadiene-styrene
  - Styrene-butadiene rubber
  - Ethylene-vinyl acetate
  - Ground tire rubber
  - Polyphosphoric Acid (PPA)

AGGREGATE TYPES INCLUDING:
- Granite
- Diabase
- Diorite
- Basalt
- Gabbro
- Rhyolite
- Andesite
- Dacite
- Chert
- Marble
- Quartzite
- Gneiss
- Natural Sand and Gravel
- Limestone
- Dolomite
- Sandstone
- Slag
- RAP
- RAS

WARMGRIIP FEATURES

<table>
<thead>
<tr>
<th>Comparison Criteria</th>
<th>WarmGrip N1</th>
<th>WarmGrip Z1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makes compaction easier and improves workability</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Protects against moisture damage and stripping</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Passes adhesion tests with challenging asphalts and aggregates</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Compatible with PPA-modified asphalt</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Efficacy with prolonged storage in hot asphalt</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Low odor, low smoke</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Odorless, smokeless</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>No heated storage required</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Engineered for performance with Canadian siliceous aggregate types, including</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>natural gravel</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

THE ROAD SCIENCE ADVANTAGE

ArrMaz’s Road Science division is a leader in the development of asphalt additives, emulsifiers, and paving and recycling system technologies for the asphalt industry worldwide. Our offerings span the entire customer value chain from producing key chemical components for asphalt refineries, terminals, emulsion plants and hot mix asphalt (HMA) plants, to providing laboratory and field engineering support of pavement applications. Road Science delivers responsive, comprehensive and dependable customer support focused on helping our customers succeed. Through our experienced staff of professionals and world-class American Association of State Highway and Transportation Officials (AASHTO) accredited laboratory in Tulsa, Oklahoma, we work alongside our customers helping them to:

- Improve product quality and consistency
- Improve product performance
- Bring new products to market
- Solve product problems
- Increase profitability
- Increase operational efficiency

Contact Road Science today and learn how WarmGrip can help you make the grade.
Call +1-918-960-3800, email customerservice@roadscience.net or visit our website at roadscience.net for further information.

The information contained herein is presented in good faith and believed to be accurate, however, ArrMaz Products, LP assumes no responsibility or liability for the information provided. ArrMaz Products, LP further makes no representations or warranties, either express or implied, of merchantability, fitness for a particular purpose or of any other nature with respect to the information or the product(s) to which the information refers.

© 2019 ArrMaz Products, LP. All rights reserved. This material may not be reproduced, displayed, modified or distributed without the express prior written permission of the copyright holder.