ACE Fiber is a significant achievement in additive technology to enhance asphalt performance. To create ACE Fiber, aramid fibers and Sasobit® wax are blended together to simultaneously address the two major distresses affecting hot mix asphalt performance today, cracking and rutting, dramatically improving service life expectancy. As ACE Fiber is mixed directly into the hot mix asphalt and as the Sasobit wax melts, millions of aramid fibers are dispersed throughout each tonne of hot mix asphalt, providing a 3-dimensional reinforcement that increases the asphalt’s resistance to reflective cracking, rutting and fatigue while providing improved life expectancy. And best of all, no specialty contractors are needed for installation. Asphalt Producers and Pavers handle hot mix asphalt reinforced with ACE Fiber the same way they handle standard hot mix asphalt.

How does ACE Fiber make asphalt more durable?

Many fibers have been successfully used to reinforce concrete, but it takes a unique fiber to successfully reinforce warm mix and hot mix asphalt. Aramid is a unique fiber with high tensile strength (2,700 MPa), low elongation, and micro-roots that anchor themselves into the finished asphalt mixture. In the summertime when asphalt gets hot and wants to shrink, aramid fibers provide added tensile strength for the in-place asphalt to mitigate rutting. In the wintertime when asphalt is cold and wants to shrink, aramid fibers provide added tensile strength for resistance to cracking. The bottom line is that the use of fibers in asphalt now make sense because of aramid, and for relatively low cost ACE Fiber makes a significant performance improvement in asphalt.

ACE Fiber

Sasobit Wax Treatment

- ▲ 50% Increase in rut resistance
- ▲ 150% Increase in strength
- ▲ 140% Increase in crack resistance
- ▲ 290% Increase in fatigue life
- ▲ 150% Increase in thermal crack resistance

- ▲ Individual coated Aramid clips provide exceptional control of the Aramid into the mix
- ▲ Provides superior/thorough disbursement of Aramid into the mix
- ▲ Completely becomes soluble in the mix at a flash temperature of 110°C with no effect on the Aramid once melted

Technology Behind ACE Fiber

ACE Fiber is pure aramid fiber coated with Sasobit wax. By treating the bare fiber with wax, the aramid is weighted down and controlled for proper delivery into the asphalt mix. When ACE Fiber enters the asphalt mixing chamber, the wax melts to disperse the fibers in the right place at the right time. This unique delivery process results in the highest performing blend of Fiber Reinforced Asphalt Concrete (FRAC) on the market. Any asphalt project can benefit from ACE Fiber including both newly constructed asphalt pavements as well as thin asphalt overlay projects over deteriorated asphalt or concrete pavements.

Engineered for Performance

ACE Fiber is a high performance engineered fiber for hot mix asphalt which has been designed to provide increased service life, lower costs, or a combination of both. Similar to other types of fibers used in concrete for decades, aramid fibers are now used in asphalt mixtures to significantly increase performance of new asphalt pavements and overlays.

ACE Fiber mixed in PG 64-22 hot mix asphalt has been extensively tested based on the Texas Transportation Institute’s Balanced Mix Design Method. The purpose of this testing was to quantify ACE Fiber’s cracking and rutting performance improvements of the hot mix asphalt. The results shown below are impressive, by adding ACE Fiber to the PG 64-22 the cracking resistance improved 140% and rutting resistance improved by 50%.

ACE Fiber can be easily introduced into the asphalt mixing process at drum or batch plant facilities. Based on the standard dosing rate of 130 g/t (4.2 oz/ton), fiber is added to the plant on a continuous basis, through either manual or automated dosing systems, at a volume matched to the production speed or size of the facility. Millions of aramid fibers are mixed with the heated aggregates prior to the addition of the asphalt cement binder. As ACE Fiber is mixed in, the binder melts, releasing the aramid fibers so that 65 g/t (2.1 oz/ton) of fiber is fully integrated into each tonne of asphalt produced.

Ensuring the aramid fiber is mixed properly is a critical component in the use of fiber reinforced asphalt pavements which requires trained personnel. To ensure ease of use, owners and contractors have the choice of having trained Nilex QA/QC personnel control the mixing process at the asphalt plant, or Nilex can train and certify the contractor’s staff to perform the fiber mixing themselves. Trained personnel are required for both the manual and automated dosing systems. By using certified mixing technicians, the on-site QA/QC mixing technician will document the mixing process thus allowing the issuance of a certified mixing report, sealed by a professional engineer, at the end of each project. This report provides peace of mind to the asphalt producer and the owners or specifiers on every project. ACE Fiber dosing systems are available for project-specific rental or purchase.
FRAC with Aramid fiber has been tested in the laboratory and the field since the mid 1990’s.

<table>
<thead>
<tr>
<th>Standard Asphalt</th>
<th>FRAC Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>▲ Asphalt is “Rocks &amp; Glue”</td>
<td>▲ “Roots” Grab Asphalt Particles</td>
</tr>
<tr>
<td>▲ Low Tensile Strength</td>
<td>▲ Fibrous Tensile Solid/3D Reinforcement</td>
</tr>
<tr>
<td>▲ Temperature Susceptible</td>
<td>▲ Temperature Tolerant</td>
</tr>
<tr>
<td>▲ Rutting, Cracking, Fatigue</td>
<td>▲ Resists Flow and Energy</td>
</tr>
<tr>
<td>▲ Chemical Bond</td>
<td>▲ More Stable Mix</td>
</tr>
<tr>
<td>▲ Bitumen Breaks Down</td>
<td>▲ Supports Bitumen</td>
</tr>
</tbody>
</table>

Aramid Fibers under microscope show micro-root structures that anchor themselves within the asphalt increasing tensile strength of the mix.

Get the most out of ACE Fiber. Contact us today.

We look forward to answering your questions about this innovative product. Whether it concerns special applications, ad mixture formulations, or optimizing dosage, please contact Nilex for a free consultation.