

EVERYTHING ASPHALT

Hot Mix Asphalt



"Asphalt is of particular interest to the engineer because it is a strong cement, readily adhesive, highly waterproof and durable."

MS-5, The Asphalt Institute

The Road Paving Material of Choice

Over 90% of the paved roads in the U.S. are constructed of hot mix asphalt (HMA). HMA is composed of 92-96% aggregate (by weight) and the liquid asphalt cement. The asphalt binds the rocks together in a strong but flexible pavement structure.

For a full depth asphalt pavement, layers of HMA are placed over a prepared subgrade and base according to a pavement design. There are three different mix layer design types, depending on their position and function in the pavement structure. The lowest layer is the base course followed by the binder course and a final surface or wearing course. Generally the maximum size aggregate is the smallest in the wearing course, larger in the binder course, and even larger in the base course. The asphalt percentage is generally highest in the wearing course, lower in the binder course, and even lower in the base course.

HMA can be dense-graded, open-graded or stone matrix asphalt (SMA), as defined by the aggregate gradation. Open-graded surface courses allow surface water to drain away quickly, preventing hydroplaning and improving visibility in wet weather. SMA has a strong stone-on-stone aggregate structure, with a relatively high asphalt binder content. SMA binders are modified with polymers, fillers and fibers to yield a high film thickness on the aggregates.

SHRP Superpave

SHRP (the Strategic Highway Research Program) was a 1988-1993 \$150,000,000 project sponsored by the federal government to extend life and reduce life-cycle costs of asphalt pavements, to reduce maintenance costs and to prevent premature failures. Superpave (Superior Performing Asphalt Pavements), the product of SHRP, includes improved methods for grading asphalt, selecting materials and designing HMA mixtures. Performance Graded (PG) asphalt binders are graded by their high, intermediate and low temperature physical properties. For example, a PG 64-22 indicates that the asphalt will have the ability to resist rutting at 64°C (as measured by dynamic shear rheometry), the expected high pavement temperature for a PG 64-22 climate, and will have a maximum stiffness at -22°C (as measured by a bending beam rheometer test) to resist thermal cracking at that pavement temperature. To limit the number of grades, the specifications were given in increments of 6°C (PG 64-, 70-, 76-, etc.). To meet the PG grades, there are other requirements for such things as viscosity at construction temperatures and mass loss on heating. The tests are run after aging protocols designed to replicate field conditions.

Polymer Modified Asphalts

Polymers can improve an asphalt's durability and resistance to rutting at high temperature and cracking at low temperature. The structure of an elastomeric polymer within the asphalt means the mat will be more elastic under traffic and less sensitive to temperature fluctuations. The modified materials are slightly more expensive than unmodified, but life cycle cost studies have shown that they quickly pay for themselves in longevity, especially on high traffic volume roads. Higher PG grades require some type of modification.

Construction

The hot asphalt cement is mixed with heated aggregate at a hot mix plant. The hot, mixed material is transported to the paving site where it is placed by a paving machine in specified lift thicknesses. The HMA mat is immediately compacted with rollers to a specified density.

Martin Asphalt Products for Hot Mix Asphalt

PG 64-22 PG 70-22 PG 76-22	Hot mix asphalt is made with Superpave performance graded asphalt binders. PG 64-22 is used for typical paving. For high volume traffic roads, roads with standing and stopping traffic, or open-graded mixes, the higher grades are recommended.
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Martin Asphalt Makes It Easy

PG asphalt for HMA, tack emulsions, asphalt emulsions for warm and cold mix. Through Martin Asphalt, you get **Everything Asphalt**—a full range of products for your pavements. In addition, you receive technical assistance in selecting the right materials and application. The company's AASHTO Certified Laboratory makes sure the products meet your specifications. And your products are delivered both on spec and on time via Martin's Gulf Coast network of production plants, storage facilities and transportation fleet including ocean-going and inland barges, rail cars and tanker trucks. Contact us for more information on the best products for your application.

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