

The advanced polymer that locks in the performance of modified asphalt

Project Profile




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Oklahoma Highway Projects Prove Application Ease

It's a state known for cattle, wheat and oil wells, but Oklahoma has also become a major industrial power, aptly demonstrated by the ever-growing volume of trucks traversing its burgeoning highway system.

"Oklahoma roads take a pounding both from traffic and the environment," says Don Thompson, Product Manager, Total Petroleum, Inc., Denver, Colo., a supplier of oils for modifying paving asphalts. "Oklahoma summers can really sizzle, and when asphalt gets hot, it's prone to rutting, particularly on highways frequently traveled by heavy 18-wheelers."

In addition to rutting problems in high traffic areas, Oklahoma's roads have also been plagued by "asphalt stripping," a condition that occurs when asphalt cement actually debonds from the aggregate. With nothing to bond the aggregate below, the result is often severe potholes, one of the problems Oklahoma Department of Transportation (ODOT) engineers hope to correct with polymer modified asphalts (PMAs).



Polymer modified asphalt, which is formulated to resist rutting in summer and stress cracking in winter, is indeed becoming a focal point in Oklahoma's highway maintenance strategy, as it is in many other states. "We're selling as much modified asphalt oil as we can make and there seems to be no let-up in demand," says Thompson. "I think we're seeing that this technology is evolving from the developmental stage, and is becoming a mainstream paving method in many states."

Total Petroleum's PMA incorporates a unique polymer specifically designed for asphalt modification: DuPont Elvaloy® RET reactive elastomeric terpolymer. "Elvaloy® is unlike any other polymer used for asphalt modification," says Thompson. "When it is blended in the mixture, a chemical reaction takes place that leads to a totally homogenous product. Once the Elvaloy® is blended in, it can never separate from the rest of the mixture, and that guarantees that the asphalt will retain its consistency."

Modified asphalt based on Elvaloy® has recently been used on two major Oklahoma projects, one on Highway 11 just east of Ponca (repaving 8 miles of roadway with 8,500 tons of asphalt), and on Highway 20, between Fairfax and Hominy (repaving 20 miles with 28,000 tons of asphalt). Jim Bell, of Bellco Construction, Nowata, Okla., the contractor for both jobs, noticed a distinct difference in handling with Elvaloy®.

"The Elvaloy® mixes were a whole lot more forgiving and workable than other PMAs we've used, and they didn't create any blue streaks during mixing," says Bell. "Some modified asphalts are so sticky that you can hardly shovel them or get them through the machinery, particularly if they've cooled down. The manufacturers say we should apply them at 325 degrees F, plus or minus 20 degrees, which is what we do, but some of these materials get very lumpy and sticky at the low end of the temperature range. We've found that the Elvaloy® mixes are much more workable at the low end of the range, and they permit much faster cleanups."

Bell points out that temperature considerations are a factor in the transportation of a PMA, too. "I'd be reluctant to truck some of the mixes more than 40 miles to a job site. They could cool down too much and we'd have a tough time getting them off the truck and an even tougher time getting them through the machinery. Elvaloy® mixes eliminate most of that worry for us."

Another advantage of Elvaloy® is its long shelf life. "We normally use our asphalt mixes before that's an issue," says Bell, "but even if we don't, and then there's a weather delay of several days, or we have to suspend paving for a weekend, and it's good to know that an Elvaloy® mix will not separate in storage, and needs no agitation to keep it from setting up or separating. It could sit weeks and still come out of the tank like new."

Ease of application counts for a lot, but at Total Petroleum, they know it's long-term highway performance that really counts. "There are really two key things driving this trend to PMAs," says Total Petroleum's Thompson. "One is that all states are looking for better road performance, and the other -- an outgrowth of state research and development efforts -- is the federal Strategic Highway Research Program (SHRP). Its testing results are clearly pointing to PMAs as one of the best ways to extend road life and curb maintenance expense."

SHRP, which is supported by the Federal Highway Administration and a majority of states, has issued new specifications based on long-term laboratory testing of many different asphalt formulations. SHRP test results are expected to correlate closely with field experience.

"Many of the standard asphalt formulations simply can't meet the new specs, which will be phased in over the next several years," says Thompson. "This will force a move to PMAs, particularly in states with severe climates, or for highways subject to heavy traffic. We estimate that 50 to 60 percent of all our future oil sales will be for paving projects using PMAs."

Paving contractor Bell doesn't speculate on just what the future holds for PMAs, but he knows one thing for certain. "When I compare Elvaloy® mixes to other PMAs we've used, I see they pump a little faster, work a little faster, and clean up a little faster. We're a production-oriented company, and that counts a lot for us."

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