An Official Publication of the Rubber Pavement Association

Asphalt-Rubber Long-Term Performance

The Proof is in the Pavement

One major advantage to using an asphalt-rubber binder in a pavement is the increased pavement life through better resistance to cracking and fatigue caused by heavy traffic. Case studies have proven again and again that asphalt-rubber materials, when designed properly will last much longer than conventional unmodified asphalt materials.

Take a look at test sections placed on I-40 near Flagstaff AZ. These photographs taken after 8 years of tough field performance in a climate at 7000 feet in elevation, 100 inches of snow each year and temperature ranging from 20 below zero to 100 degrees F. The photo above on the left side is a 4-inch thick conventional overlay and the photo on the right side is a 2-inch thick overlay.

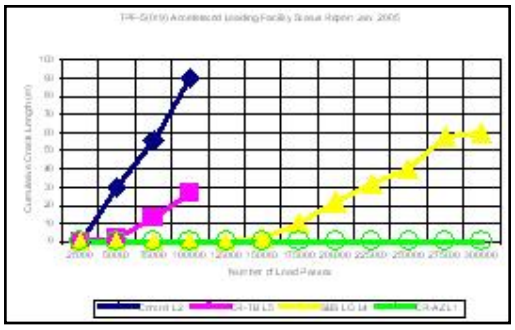
Asphalt-Rubber pavement materials have undergone some of the most extensive pavement testing protocols known to man and have always come out as the best. For agencies that have used asphalt rubber, better long-term field performance is expected.

A-R CRACKS LESS

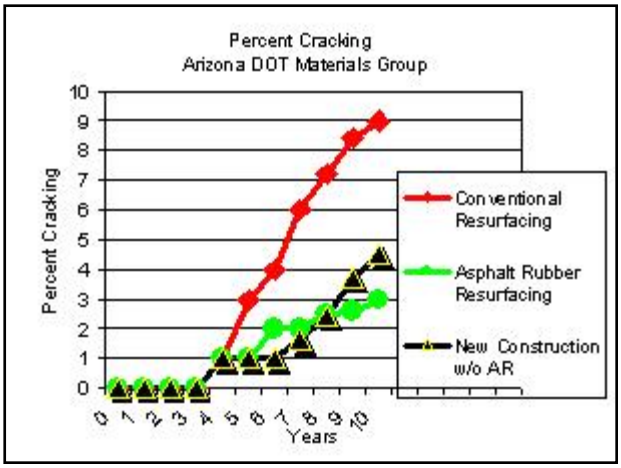
The Arizona Department of Transportation has been using the material since the 1980s. A chart provided by ADOT shows that after ten years of performance in the field, Asphalt-Rubber resurfacing not only outperforms conventional resurfacing by 3-to-1, but it beats out newly constructed pavements as well.

EXTENSIVE RESEARCH

The Federal Highway Administration's Turner Fairbank Research Center, Accelerated Loading Facility located in Northern Virginia near Washington, D.C. has been testing a variety of modified pavements since 2001.



This machine is affectionately called the "ALF". The machine straddles a pavement section and rolls a tire, with a specified load, repeatedly across the pavement surface. While other materials failed, the



Asphalt-Rubber did not crack even after 300,000 passes! The performance of the Asphalt Rubber exceeds the most sophisticated chemically engineered asphalt modifiers available on the market today. Again, this performance was expected. It reconfirms testing completed in the 1990s.

In 1992, The California Department of Transportation (Caltrans) and the South African Council for Scientific and Industrial Research (CSIR) conducted testing with the Heavy Vehicle Simulator (HVS). Similar to the ALF, the HVS moves a loaded tire repeatedly over a pavement section a specific number of times or until it is cracked. After each set of passes, the cracks are marked and measured.

The Heavy Vehicle Simulator and close up of loading wheel can be seen in the photos to the left.

In this testing, three resurfacing strategies were studied: A 3-inch overlay with regular asphalt, a 1.5-inch overlay with asphalt rubber and a 1-inch overlay with asphalt rubber. The testing wheel was loaded to standard weights expected on U.S. Highways. After 175,000 passes, the Conventional material had cracks and the asphalt rubber sections had none. The wheel load was increased to double the standard wheel load on U.S. Highways and the testing continued. After 25,000 passes with double the weight, the conventional, 3-inch section was completely cracked after 200,000 passes.

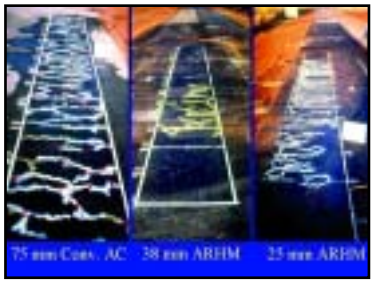
For the asphalt rubber sections, the testing continued. The very thin, 1-inch A-R overlay lasted for another 37,000 double load passes before it was completely cracked. But for the 1.5 inch AR section, the testing continued, but with the surface temperature of the pavement reduced to 23 degrees. Even in freezing temperatures with twice the load, the A-R resisted cracking. At the final pass, after 250,000 passes (75,000 passes at double the load) The asphalt rubber was only cracked through half of the section.

THE RESULTS

Performance

Repetitions	Wheel Load	AC Overlay Section (75mm)	ARHM-GG Section (38mm)	ARHM-GG Section (25mm)
0-100,000	40kN	Fine cracks at 100,000	—	—
100,000 to 175,000	40kN	Block cracks at 175,000	—	—
Wheel load Changed to 80 kN				
175,000 to 200,000	80kN	Completely cracked	—	Fine cracks
200,000 to 237,000	80kN	Test stopped	—	Completely cracked
Surface Temperature Reduced to –5 C				
237,000 to 250,000	80kN	Test stopped	1/2 of Section cracked	Test stopped

The chart above summarizes the test results. The photo below shows the cracks in each section after the testing was completed. This performance has prompted the Caltrans Chief Engineer to state in a memo to all Caltrans District Engineers that Asphalt-Rubber:



"..is more durable, resistant to cracking and can achieve the same service life at half the thickness of conventional dense graded asphalt concrete for rehabilitation projects. The strategy improves pavement performance, saves valuable resources and reduces the number of tires entering landfills and stockpiles." January 31, 2005, Richard Land, Chief Engineer.

Choose proven long term performance, choose asphalt-rubber.

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