

# Honeywell Titan™ for Paving Applications



## Polymers for Asphalt Modification

**Honeywell**

# Better Roads, Enhanced Asphalt Performance

Honeywell Titan™ polymers for asphalt modification help the paving industry decrease energy usage, reduce emissions and save money, while helping meet demanding road specifications.

## Easier Compaction

Asphalt modified with Honeywell Titan compacts more easily than SBS-modified asphalt, so fewer roller passes are needed to achieve the same result. The modified asphalt also retains the base asphalt's low viscosity, so road crews can rake more easily and perform other work by hand versus having to use heavy machinery.

## Energy Reduction

Honeywell Titan polymers have unique properties, such as low viscosity, that can help decrease the number of roller passes required to pave a road and potentially decrease fuel usage, in comparison with traditional SBS polymers. Decreased roller passes and reduced fuel consumption translate to savings in time and money. In a paving trial with the Texas Department of Transportation, Honeywell Titan polymers helped decrease the amount of fuel required to mix the asphalt by 13 percent, and decreased the number of paving roller passes by one-third, which reduced paving time.

## Extended Paving Season

Crews can use asphalt modified with small quantities (for instance, 1.5-3%) of Honeywell Titan to blend, mix and pave at

lower temperatures than those required to use asphalt modified with conventional SBS polymers – without the addition of warm mix additives. This widens the paving temperature window and allows for easy hand-finishing. Adding small quantities of Honeywell Titan to asphalt enables workability of the material at 54-72°F lower than asphalt modified with other polymers. In addition, road paving can occur at outside temperatures as low as 30-40°F. Using Honeywell Titan can also improve the moisture resistance of asphalt because of its anti-strip properties.

## Decreased Emissions

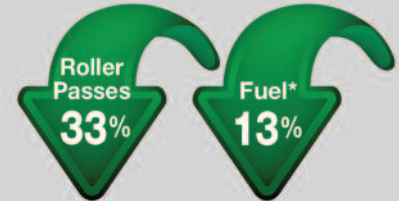
Lower mixing temperatures and fewer roller passes use less energy and resources, so Honeywell Titan offers significant environmental benefits. Using asphalt modified with Honeywell Titan can reduce paving-related emissions of sulfur dioxide (SO<sub>2</sub>) by 82 percent, nitrogen oxides (NO<sub>x</sub>) by 43 percent, volatile organic compounds (VOCs) by 19 percent, and carbon dioxide (CO<sub>2</sub>) by 18 percent.

## Honeywell Quality

Honeywell's complete line of polymers is backed by a dedicated team of commercial and technical experts to assist you and the industry. As the world's first commercial manufacturer of low molecular weight polyolefins and functionalized olefinic polymers, Honeywell has been the industry leader in specialty additives for more than 50 years.

## COST SAVINGS BENEFITS

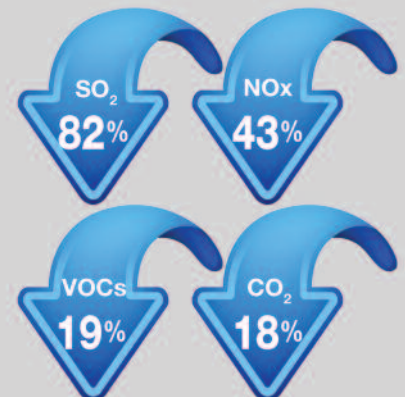
In a highway paving trial performed in collaboration with the Texas Department of Transportation, Honeywell Titan polymers offered significant cost benefits.



\* Calculated using National Asphalt Pavement Association's greenhouse gas calculator.

## ENVIRONMENTAL BENEFITS\*\*

Data from the paving trial, when applied to an industry model, suggests that using Honeywell Titan-modified asphalt generated substantial environmental benefits.



\*\* Extrapolated from ISAP 2008, Jullien et al. Environmental Assessment of HMA.

## Honeywell Specialty Additives

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