Warm mix asphalt production using ethanol

Technology #cu13364

Asphalt is a widely-used material for road construction and can also function as a sealant material. Traditional asphalt production requires high-temperature heating of the asphalt blend to reduce viscosity and achieve thorough mixing. In recent years, a new class of asphalt called warm mix asphalt has been developed which uses mixture additives to reduce the required production temperature, allowing for better workability and reduced greenhouse emissions. While most warm asphalt techniques employ water-based additives, this technology uses an ethanol mixture as a mixing solvent to further reduce the temperature needed to mix the asphalt, minimizing the risk for moisture trapping in the asphalt that may lead to structural problems in the long term.

Alcohol-based asphalt production is economically and environmentally efficient

Warm mix asphalt production has attracted significant attention recently due to increasing economic and environmental pressures within the construction industry. By using ethanol instead of a water-based additive, the economic and environmental advantages of warm mix asphalt production are even further enhanced. Ethanol exhibits lower specific heat and latent heat compared to water, allowing it to change temperature more easily. Since less energy is required for production, gas consumption and greenhouse emissions are significantly reduced compared to water-based techniques. Furthermore, production at lower temperatures provides workers in the construction industry with greater control and flexibility within the asphalt production timeline. By taking advantage of the reduced temperature requirements, this technology moves asphalt production in a more economically and environmentally sustainable direction.

Initial results have demonstrated that ethanol can reduce mixture viscosity by up to 95% and can increase asphalt volume by 30-40%, reflecting the great potential of this technology to improve asphalt sustainability and decrease the life cycle costs of asphalt construction.

Lead Inventor:

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Applications:

- Asphalt production for road construction and paving
Asphalt production as a sealant material

**Advantages:**

- Lower temperature production compared to traditional mixing and water-based warm mixing
- Reduced gas consumption
- Reduced greenhouse emissions
- Increased flexibility in the asphalt production pipeline in terms of equipment and ambient temperature requirements

**Patent Information:**

Patent Pending (US 20160152830)

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