

Cargill Road Construction Case Study: Cold Climate Counties Find Success with Warm Mix Additive

Situation

Crow Wing and Wright counties are the only two MN counties that require warm mix asphalt for all their paving projects. So as those local agencies address road maintenance needs, they call for a consistent and reliable additive solution to help deliver on state and county specifications and contractor density goals.

In Minnesota, warm mix asphalt is defined as any mix produced at temperatures 30° F or lower than typical Hot Mix asphalt mixing temperatures. Additives like Cargill's bio-based Anova® Warm Mix Additive, are key in producing effective mixes for these counties.

Goal

Warm mix asphalt must meet stringent specifications and also enable added benefits. These two MN counties specifically wanted to reduce energy consumption at the plant, work with a bio-based additive for safer handling, reduce premature aging as a result of high mix plant production temperatures, and deliver environmental benefits (such as lowering greenhouse gas emissions) all while maintaining consistent high performance.

Solution

Cargill's Anova® Warm Mix Additive has been meeting the needs for these counties for more than three years.

Wright County used the additive in 2020 to help meet very specific specs, including level 4 wear and non-wear courses (a level 4 indicates a high traffic level pavement in MN) using polymer modified binder grade of PG 58V-34. The specification also requires a significantly reduced mixing temperature, targeting 230° F. For context, typical mixing temperatures in hot mix asphalt can be in the range of 290° to 320° F.



Wright County paving crew laying down asphalt with Cargill's Anova® Warm Mix Additive.

“Given Wright County's very strict spec of not accepting mix over 260° F, we are confident we can use Cargill's Anova® additive to help us meet that temperature target, as well as delivering on density goals,” said Rob Kuehborn, Director of Materials and Quality at [Commercial Asphalt Company](#). “Not only are we able to include a plant-based ingredient to our mix that's better for the environment, we're able to lower fuel costs at the plant, thus saving cost on overall production.”

“My main objective with using a warm mix additive like Cargill's Anova® Warm Mix Additive is cold weather performance and eliminating any artificial aging at the plant,” said Wayne Dosh, Senior Engineering Technician for Crow Wing County. “The Anova® additive allows us to meet both of these goals on a consistent basis.”

CASE STUDY

Results

Despite the aggressive mixing and compaction temperature targets, the paving team on the Wright County project was able to achieve extremely consistent densities with an average of 93.4% with no reported workability issues or discrepancies during production by utilizing the Anova® Warm Mix Additive.

The contractor on this project used the Anova® additive throughout 2020 on various Wright County projects and was very happy with the results. Not only did they meet density goals, they also saved on cost by using less fuel at the mix plant. And they confirmed it was easier to work with because it is plant based and their customers appreciate a more environmentally friendly asphalt option.

Not only did the approach deliver on performance goals, there was a clear economic benefit with the reduction of fuel when mixing at a lower temperature (at 230°-240° F as opposed to 300° F) and being able to utilize alternative grades of asphalt.

“Cargill’s additive allows us to utilize lower grade oil (58S-28 for warm mix compared to a 58H-34 for hot mix) to achieve similar, and sometimes better results at lower or equal cost,” said Chad Hausmann, Assistant County Engineer for Wright County. “This is preferred by our contractor partners given the cost savings with maintaining quality performance. We have not seen a reduction in pavement quality, ride or density with the Anova® additive. In fact, contractors consistently see density bonus payments given the quality of the mixes they can produce.”

More counties across the region are taking note given the benefits of lower fuel emissions, cost, environment and safety impact, and overall mix performance.

Key Learning

Additives can help deliver a consistent warm mix to meet very specific density and quality specs despite significant shifts in temperature.

Engineered plant-based additives can provide safer handling and serve as a longer-term sustainable solution around the world. However, in rural ag communities like outstate Minnesota, farmers have an opportunity to see their crops being used for new and innovative solutions including use in Cargill’s Anova® Warm Mix Additive.

“Crews comment that using Cargill’s plant-based additive has less odor compared to other products and isn’t toxic,” said Hausmann. This becomes even more important with projects located in residential areas.”

Cargill’s road construction team works closely with mix providers, construction firms and road owners all over the world, but for these Minnesota-based road construction companies, they appreciate the ability to work with a home state firm for their paving needs.

“As Cargill is a locally-based company, we appreciate working with the team there,” said Kuehborn at Commercial Asphalt. “They are always accessible, professional and pleasant to work with on every project we’ve done with them.”

At the county level, engineers feel good about working with a local company as well.

“By working with Cargill, we’re supporting the local economy while accessing a product that meets our performance goals,” said Dosh.

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