

# Warm Mix Asphalt in MN

With the United States Clean Air Act passing into law in 1970, environmental responsibility has been a major priority to U.S. industries and abroad. The asphalt pavement industry is no exception and has taken great initiatives to be leaders in these initiatives. Today, the production and placement of asphalt pavements consumes less fuel and produces lower levels of greenhouse gases. Since 1970, the asphalt industry has decreased total emissions from asphalt plants by 97 percent while increasing production by 250 percent.

Emissions from asphalt plants are so low, the EPA considers them as only minor sources of industrial pollution. Currently there are initiatives for reducing the temperature at which asphalt pavement is produced and placed and thus further reducing emissions and energy used, as well as many other benefits.



Warm Mix Asphalt (WMA) technology allows the mixing, laydown, and compaction of plant produced asphalt pavement mixes at significantly lower temperatures. The technology can reduce production temperatures 35°F to 100°F lower than conventional asphalt pavement. A scanning committee in the U.S. was formed in 2002 to investigate the European technology and pursue research and development work necessary for implementation. Today there are countless numbers of successful WMA projects throughout the nation and in Minnesota.

There are several benefits with the use of WMA technologies including:

- reduced energy consumption,
- reduced greenhouse gas emissions,
- improved working conditions at the paving site,
- cool weather paving,
- compaction aid,
- ability to extend the paving season,
- longer haul distances, and
- potentially higher recycled asphalt pavement (RAP) percentages.



The number of WMA technologies is expanding. They involve designing the mix with either a



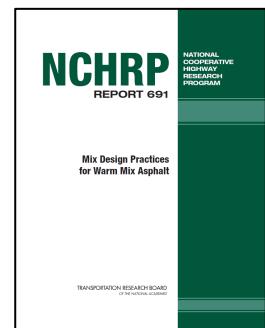
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chemical additive, an organic additive, or by a foaming mechanism. These are all viable options and each of the technologies available are discussed at a web site dedicated to WMA information at [www.WarmMixAsphalt.com](http://www.WarmMixAsphalt.com).

Since 2007, there have been several successful WMA projects in Minnesota with either a chemical additive (Advera, Revix or Evotherm 3G) or a foaming additive. In 2010, the Minnesota Department of Transportation (Mn/DOT) changed their specification for asphalt pavement (Mn/DOT Spec 2360) to allow WMA provided the quality of the mix is maintained or improved. The permissive spec requires quality measures and allows for economics and the market to dictate when WMA will be used and how it will be produced. Thus, it is not necessary to specify WMA nor the method to create WMA nor the temperature.

Mn/DOT also allows the use of recycled asphalt pavement (RAP) and recycled asphalt shingles (RAS) in asphalt pavements as per the 2360 Specification and should not be precluded with the use of WMA. Recycled materials have been used in the WMA projects with success. In fact, it is another benefit of WMA technology that allows for higher percentages of RAP by allowing for better compaction and decreasing the aging of the asphalt binder, both of which increase the pavement service life and lead to cost savings for the taxpayer/owner of the pavement.

The “Warm Mix Asphalt Special Report: Mix Design Practices - NCHRP 09-043” is complete and summarized in TRB Report 691. Of particular note are the Summary Findings, which includes the statement “WMA mixtures designed in accordance with AASHTO R 35 will have similar properties as HMA mixtures.” In addition, the report finds that “only minor changes to current mixture design practices are needed to design WMA mixtures.” The report is available at [http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rpt\\_691.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_691.pdf).



Asphalt pavement is a basic building block of our nation's infrastructure. With more than 2 million miles of paved roads in the country, 94 percent are surfaced with asphalt pavement. As the United States goes green, asphalt is keeping pace with the times. Warm mix is an important step in sustainable development, simultaneously conserving natural resources, reducing the carbon footprint of the industry, and improving the quality of the pavements that Americans rely on.

**For more information on Warm-Mix Asphalt technology, visit**  
[\*\*www.WarmMixAsphalt.com\*\*](http://www.WarmMixAsphalt.com)



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