

## LABORATORY EVALUATION OF WARM MIX ASPHALT PROPERTIES

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### *ABSTRACT*

Warm Mix Asphalt (WMA) technologies allow significant lowering of the production and paving temperature of the conventional Hot Mix Asphalt (HMA). This promises reduction of the energy consumption, thus lowering the greenhouse gas emissions and offers various additional benefits, e.g. better compaction, extended paving season etc. However, in order to reach widespread implementation of WMA, it is necessary to prove that it has the same or better mechanical characteristics and long-term performance as HMA.

This article presents the results of a laboratory study that has been conducted to evaluate products of two different WMA technologies – chemical and organic. The testing consisted of two parts – determination of changes in rheological properties of bitumen and testing of asphalt mixture. The properties of bitumen have been tested after modification with two different dosages of each WMA additive by traditional EN test methods and using the Dynamic Shear Rheometer. The properties of stone mastic asphalt were determined after densification with two different compaction methods at four different compaction temperatures. The test results that include evaluation of physical and mechanical properties show that it is possible to reduce the compaction temperature of 155°C for HMA to 125°C for both tested WMA products with maintaining similar mechanical characteristics as the HMA. It was also established that for laboratory prepared mixture two hour asphalt ageing is essential in order to perform adequate comparison of WMA and HMA.

*KEY WORDS:* Warm Mix Asphalt, rheology, stiffness, ageing, deformations.