# KINETICS OF BITUMINOUS PHASE DECOMPOSITION AND ITS IMPLICATIONS ON THE MECHANICAL PROPERTIES

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*ABSTRACT*

Since bitumen is an engineered material, fundamental understanding of the relation between its chemistry and its resulting mechanical behavior would allow for adjusted manufacturing procedures to tailor the material for its specific application in various pavement structures. With the current trend of globally increasing oil-prices, a more careful use of the bitumen would certainly translate in long-term economic and societal advantages. For this reason, a new model for bitumen is being developed which aims at bridging the gap between fundamental bitumen chemistry and mechanical response. In the model, the kinetics of bituminous phase decomposition is being modelled and used to explain mechanical properties that can be measured at a larger scale. The ultimate aim of the model is to improve the long-term behaviour of asphalt concrete in pavements by directly improving the chemical composition of the material components. The paper presents a newly developed model, the experimental work behind the model and summarizes some of the theoretical background. Preliminary results are shown of an up-scaling of the model.

*KEY WORDS:* Chemo-mechanics, bitumen, self-healing, phase separation