

DEVELOPMENT OF MASTER CURVES FOR ASPHALT MIXTURES USED IN ROMANIA

Carmen Răcănel *

Assoc. Professor, Technical University of Civil Engineering Bucharest (TUCB)

Adrian Burlacu

Assistant, Technical University of Civil Engineering Bucharest (TUCB)

* TUCB, Roads and Railways Department, Bvd. Lacul Tei 124, RO-020396,
Bucharest, Romania, carmen@cfdp.utcb.ro

ABSTRACT

Asphalt mixture, a blend of aggregates, filler, bitumen and additives in proportions well established, is a viscoelastic material whose rheological properties change depending on temperature, time of loading/loading frequency, loading level (σ or ϵ). To describe the rheology of asphalt mixture can be considered a master curve for a rheological characteristic, i.e. the complex modulus and phase angle. Master curve construction guidelines are based on equivalent time-temperature (which characterizes a certain behavior for the rheological properties measured at different temperatures and loading frequencies can be scaled).

This article is based on laboratory tests to determine the complex modulus using four point bending test on prismatic samples. It was considered three types of asphalt mixtures for wearing course and a type of asphalt mixture from binder course, all tested at temperatures from -5°C to 40°C and frequencies from the range 0.1Hz ... 30Hz.

For the considered asphalt mixtures the evolution of stiffness modulus $|E^*|$ is presented for temperatures and frequencies chosen (it will be constructed master curves).

Finally it will be presented the relevant conclusions about the importance of determining the complex modulus of asphalt mixtures to understand the role of this composite material in the road structure.

KEY WORDS: Asphalt mixture, stiffness, phase angle, master curve.