Viscoelastic behaviour of cold recycled asphalt mixes

Zuzana Cizkova[1] and Jan Suda[1]

[1]CTU in Prague, Faculty of Civil Engineering, Department of Road Structures, Thákurova 7, 166 29, Prague 6, Czech Republic

E-mail: cizkova.zu@gmail.com

Abstract. Behaviour of cold recycled mixes depends strongly on both the bituminous binder content (bituminous emulsion or foamed bitumen) and the hydraulic binder content (usually cement). In the case of cold recycled mixes rich in bitumen and with low hydraulic binder content, behaviour is close to the viscoelastic behaviour of traditional hot mix asphalt. With decreasing bituminous binder content together with increasing hydraulic binder content, mixes are characteristic with brittle behaviour, typical for concrete pavements or hydraulically bound layers. The behaviour of cold recycled mixes with low content of both types of binders is similar to behaviour of unbound materials. This paper is dedicated to analysing of the viscoelastic behaviour of the cold recycled mixes. Therefore, the tested mixes contained higher amount of the bituminous binder (both foamed bitumen and bituminous emulsion). The best way to characterize any viscoelastic material in a wide range of temperatures and frequencies is through the master curves. This paper includes interesting findings concerning the dependency of both parts of the complex modulus (elastic and viscous) on the testing frequency (which simulates the speed of heavy traffic passing) and on the testing temperature (which simulates the changing climate conditions a real pavement is subjected to).