

RHEO-MECHANICAL ANALYSIS OF BITUMENS PRODUCED WITH GREEN BINDER EXTENDERS

G. Tarsi, F. Mazzotta & C. Sangiorgi

Department of Civil, Chemical, Environmental and Materials Engineering – DICAM, Bologna, Italy

ABSTRACT

The purpose of this research is twofold, as it promotes the reduction of the use of non-renewable resources and enhances the introduction of recycled materials. Pursuing these goals, this study investigates innovative and green extended bituminous binders. The new binders are obtained replacing different percentages of neat bitumen, up to 44 wt.%, by combining different amounts of three recycled products: Re-refined Engine Oil Bottom, powdered rubber from End-of-Life tyres and a waste bentonite filler. At first, a rheological characterisation of these binders was performed using a Dynamic Shear Rheometer. Subsequently, they were used to manufacture asphalt mixtures. The Indirect Tensile Stiffness Modulus, Indirect Tensile Strength and volumetric analysis of samples were carried out to evaluate their potential performance in road applications. The experimental program has allowed to understand how changes in constituents materials affect the rheological responses of binders and the mechanical properties of asphalt mixtures, providing promising results.