

## THE INVESTIGATION OF RUBBER MODIFIED BITUMEN AS A BINDER FOR THE PRODUCTION OF ASPHALT MIXTURE

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### *ABSTRACT*

The use of waste tire rubbers as bitumen modifiers can contribute to alleviate pollution problems derived from discarding scrap tires. The influence of waste tire rubber powder on mechanical and rheological properties of rubberized bitumen binders were examined for samples prepared with pavement grade bitumen B50/70. The experimental data were compared with those for native bitumen B50/70 modified with amine by using the same preparation protocol as for rubberized binders. In order to examine the effect of waste rubber powder on mechanical properties of asphalt mixtures, rubberized asphalt mixtures AC 8<sub>surf</sub> were prepared according to wet and dry procedures. The mechanical and rheological properties of extracted bitumen from these asphalt mixtures were compared with the properties of extracted bitumen from asphalt mixture AC 8<sub>surf</sub> prepared without rubber powder. It was found that the addition of crumb tire rubber powder to bitumen increases, storage and loss modulus, rutting parameter and dynamic viscosity, at high in-service temperatures. From mechanical tests it was observed that presence of rubber powder in bitumen increases ring and ball temperature and decreases Fraass temperature. As a consequence, crumb tire rubber modified bitumen displays enhanced mechanical properties, which improves its resistance to both rutting and fatigue cracking.

*KEY WORDS:* Rubber modified bitumen, asphalt mixtures, mechanical properties, rheological properties, temperature dependence,