

## PERFORMANCE OF CRUMB RUBBER MODIFIED BINDERS AND ASPHALTS

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### *ABSTRACT*

Extensive research into crumb rubber modified bitumen and asphalt using recycled tires has been done. Cooperation between the pavement research centre of the University of Wuppertal and the Heiden Labor (Rostock) under sponsorship of the German Ministry of Economics has been established. In this project, bitumen modifications with variations of masses and sizes of crumb rubber as well as bitumen grades were tested. The property of the modified bitumen were verified with the standard tests penetration, density and softening point ring and ball as well as the performance tests bending beam rheometer (BBR), dynamic shear rheometer (DSR) and force ductility.

The performances of the bitumen variants show that binder properties change significantly depending on the added masses of crumb rubber and the provenience. Nearly half of the binders were tested in asphalt mixtures. The asphalt specifications were established by stiffness, fatigue, high temperature behaviour and adhesion. The DSR tests and rutting tests document that high temperature behaviour definitely gets better by adding crumb rubber into bitumen or asphalt. Better low temperature behaviour of crumb rubber modified bitumen show the BBR tests. The Quantity of crumb rubber influences directly the properties of bitumen and asphalt. All over it shows that conventional bitumen can be upgraded to a high-quality binder by adding crumb rubber of scrap tires (recycling material) and thus directly change and optimize different binder and asphalt specifications.

*KEY WORDS:* High-quality binder, crumb rubber, asphalt/bitumen performance