

THE EFFECT OF BITUMEN MODIFIERS ON THE RHEOLOGICAL PROPERTIES OF
BITUMEN

by

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ABSTRACT

This paper examines the effect of four bitumen modifiers on the rheological properties of most commonly used bitumen 80/100 pen and 40/50 pen. The results presented here are part of a research study carried out by the Laboratory of Highway Engineering, in the area of modified bitumens and mixtures, with a financial contribution from the General Secretary of Science and Research.

The four chemical additives chosen have the commercial names Cariflex (SBS), Elastoren (SBS), Styrelf (SBR) and Chemcrete. Tests carried out on the Penetration, Softening point, Recovery on Ductility, Fraass point, and viscosity, before and after Thin film oven test.

The results showed that the addition of all modifiers had a positive effect on the properties of the conventional bitumens. The degree and the magnitude of their effect depends on the type of modifier. Cariflex improves all rheological properties, reduces the temperature sensitivity, improves the elasticity, and increases the Fraas point of the bitumen. Additionally it protects the bitumen from ageing. Elastoren and Styrelf improve only the elasticity and slightly the Fraass point of the bitumen. Finally, Chemcrete softens the bitumen and improves the Fraass point. Its affect on the elasticity of the bitumen was the minimum observed from all modifiers tested. Significant oxidation also occurred on Chemcrete mixes but the final product was softer than the original bitumen.

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