

# Engineering properties of bitumen modified with bio-oil

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**Abstract.** The current high price of crude oils for bitumen production has led to various studies on the most economical way in replacing or reducing the amount of virgin bitumen as a binder in road pavement while increasing their pavement performance. The aim of this study is to investigate the effect of using bio-oil, particularly waste cooking oil, (WCO) on the engineering properties of bitumen. Both physical and rheological properties of the original bitumen and WCO modified bitumen were measured using penetration, softening point, viscosity, loss on heating and dynamic shear rheometer (DSR) tests. In this study, bitumen 80/100 pen was modified with WCO at different percentages i.e. 1%, 2% and 3% by weight of bitumen. Based on the results, it was found that addition of WCO in virgin bitumen has softened the bitumen, thus increase the temperature susceptibility. In terms of rutting resistance, the addition of WCO up to 2% has produced modified bitumen with performance grade of PG 64 which is comparable to the original bitumen.