MECHANICAL PROPERTIES OF THIN SURFACE TREATMENT FOR PAVEMENT MAINTENANCE

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Abstract	Specification tests for thin surface treatment are mainly simulated or empirical; without considering fundamental mechanical or rheological properties of the material. Thus, it is difficult to incorporate the test results into mechanical-based pavement design analysis. A series of test methods, which quantify performance-related mechanical properties of thin surface treatment employed in pavement maintenance and pavement preservation is thus needed. The objective of this study is to investigate the performance-related mechanical properties of thin surface treatment materials for pavement maintenance and preservation. The Micro-Surfacing Mat and Precast Rubber Asphalt Mat were used in this study. The Finite Element Model result indicated that the Modified Leutner Shear Test adequate to evaluate the direct shear strength of the thin surface treatment. The results show that the sensitivity loading frequency and the temperature susceptibility of the Precast Rubber Asphalt Mat were reduced by Rubber Modified Asphalt content. The Precast Rubber Asphalt Mat has greater interfacial shear strength as well as shear stiffness compared to those of Micro-Surfacing Mat. The tack coat application rate is crucial for the interfacial shear strength of Precast Rubber Asphalt Mat. This research found that shear stress and the displacement rate are positively related to the interfacial shear strength and shear stiffness. The interfacial shear strength and shear stiffness are negatively related to testing temperature. The Micro-Surfacing Mat had higher dynamic direct shear modulus, lower loading frequency sensitivity, and better rutting resistance than Precast Rubber Asphalt Mat.
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