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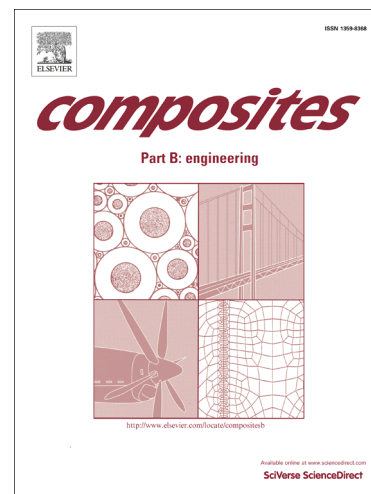
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ABSTRACT :

The nature of blending of virgin materials with reclaimed asphalt pavement (RAP) has been investigated using a multi scale approach using the dynamic shear rheometer (DSR), electron microscopy and computer tomography (CT). In order to simplify the visualization of the blending of the virgin and reclaimed materials five specially engineered hot asphalt mixtures were produced incorporating large mineral fraction (8/11 mm) of virgin aggregates and small fraction (2/4 mm) from RAP mixed with virgin bitumen. The complex modulus and phase angle of reclaimed binder from the blended mixtures were found to be between that of RAP and virgin binder. The CT slices of compacted cylindrical samples (150 mm diameter x 120 mm height) could incorporate the effect of compaction on the blending. They show lumped regions with virgin large aggregates as well as lumped regions of RAP aggregates. Using micro CT the spatial distribution of the different binders was investigated at the micro- scale. Millimeter size distinct clusters of virgin binder and clusters of RAP binder could be distinguished. The existence of RAP binder next to large virgin aggregates indicated the migration of the old RAP binder from the RAP aggregates to the virgin aggregates. From these CT images, it was not possible to verify if blending between the virgin and old binders occurred. Using electron microscopy micro-crack formations in the zone between old and new binder were identified suggesting weak spots that could lead to larger crack formation and propagation. However, using energy- dispersive X-ray spectroscopy good qualitative distribution of titanium dioxide tracer in the virgin binder in the mixture could be seen, indicating good blending at the investigated location. Hence, the results show that blending is not homogeneous throughout the sample. Some locations

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