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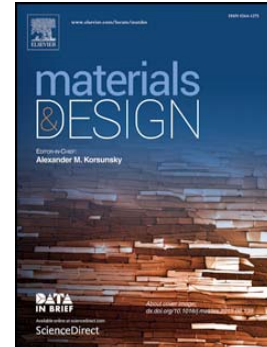
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## Effect of air voids on the high-temperature creep behavior of asphalt mixture based on three-dimensional discrete element modeling

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**Abstract:** This study focused on the effects of different parameters related to air voids on the creep behavior of asphalt mixture based on micromechanical modeling and virtual test through three-dimensional discrete element method (DEM). By using DEM software named as Particle Flow Code in three dimensions (PFC3D), user-defined micromechanical modeling was conducted for asphalt mixture. And virtual uniaxial static creep test of asphalt mixture was conducted by PFC3D and verified by laboratory creep test. The effects of air void content, microstructure parameters including size, elongated index and orientation of air voids, and air void distribution on the creep behavior of asphalt mixture were investigated based on virtual creep test. It is proved that bigger content, size and elongated index of air voids lead to greater creep strain of asphalt mixture. Compared to vertical orientation, horizontal orientation of air voids is more harmful to the creep behavior of asphalt mixture. Nonuniform distribution of air voids within asphalt mixture also has negative effects on the creep deformation of asphalt mixture, especially for vertical nonuniform distribution of air voids. Therefore,

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