

## ABSTRACT

Monte Carlo simulations offer a simple way of visualizing the arrangements of particles in a system. Reinforcement particulates are modeled as circles in a random array of finite sites within a specified finite 2-dimensional square. These random sites are checked and are reassigned to ensure no overlapping occurs between adjacent particles. An approach is proposed where only the top and bottom sides of the square are checked for percolation. For this study, a percolation threshold is obtained when at least one chain connects the top and bottom sides of the square. This is useful for conditions when mainly directional properties are of concern, for example, in cooling electronic devices or when electrical non-conductivity in one direction is important. Results show higher percolation thresholds for smaller particles.

**Keywords:** Monte Carlo simulation, composites, particulate reinforcement