

Assessing the effect of wall support on bed porosity using packings of concentric cylinders and angular walls

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Abstract

Packed beds of spheres are simulated through discrete element method in cylinders with different geometric configurations of internal walls to evaluate their effects on bed porosity. Numerical simulations are validated using well-known literature data. Three containing systems, namely concentric cylinders, angular walls, and a combination of both, are generated. The resulting bulk porosities and porosity profiles of the sphere beds are analyzed. The increase in porosity is proportional to the incorporated wall support, that is, the combination of cylindrical and angular inserts displays the greatest effect. The sinusoidal porosity values near the inserted walls are exhibited. In conclusion, the obtained behaviors and profiles can be used to explore additional effects and further systems.

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