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Effect of particle size distribution on permeability in the randomly packed porous media BOJAN MARKICEVIC, Pall Corp — An answer of how porous medium heterogeneity influences the medium permeability is still inconclusive, where both increase and decrease in the permeability value are reported. A numerical procedure is used to generate a randomly packed porous material consisting of spherical particles. Six different particle size distributions are used including *mono*-, *bi*- and *three*-disperse particles, as well as uniform, normal and *log*-normal particle size distribution with the maximum to minimum particle size ratio ranging from three to eight for different distributions. In all six cases, the average particle size is kept the same. For all media generated, the stochastic homogeneity is checked from distribution of three coordinates of particle centers, where uniform distribution of x-, y- and z- positions is found. The medium surface area remains essentially constant except for *bi*-modal distribution in which medium area decreases, while no changes in the porosity are observed (around 0.36). The fluid flow is solved in such domain, and after checking for the pressure axial linearity, the permeability is calculated from the Darcy law. The permeability comparison reveals that the permeability of the *mono*-disperse medium is smallest, and the permeability of all *poly*-disperse samples is less than ten percent higher. For *bi*-modal particles, the permeability is for a quarter higher compared to the other media which can be explained by volumetric contribution of larger particles and larger passages for fluid flow to take place.

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