Title Drying Kinetics of Corn in a Vortexing Conical Dryer

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Abstract

This paper presents the comparative study of drying corn kernels using a typical fluidizedbed and a vortexing conical bed. The experiment was carried out in a drying chamber having the variation of side wall expansion angles of 0°, 15°, 30° and 90°. In each experimental run, the corn kernel, with initial moisture around 81 %(430% dry basis) of 300 g, was put into the chamber. Then, inlet air at 80° and 100°C was flowed through the chamber with superficial air velocity of 0.5, 1.0 and 1.5 m/s for each case. The relative humidity of the ambient was around 65 - 67 %. The drying duration of each case was set to 2 hours. In every 10 minutes, weight of the corn in the bed was measured for each test of both techniques. The experimental results show that use of different velocities leads to no significant effect on drying rate for the fluidization technique but provides substantial influence for the vortex drying method. In comparison between both methods, at low velocity (around minimum fluidization velocity) the fluidization drying shows slightly better. At higher velocity the vortex drying with the wall expansion angle of 30° performs better than the others.