

# Influence of fluidizing operating pressure on the extent of polyethylene resin electrostatic charging

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*Abstract*— Significant operational challenges including particle agglomeration and reactor fouling due to the generation of electrostatic charging may occur in industrial gas-phase ethylene polymerization processes to produce polyethylene. In gas-solid fluidized beds appearance of electrostatics is due to the continuous contacts among the fluidizing particles and the particles and the vessel wall which in turn would be influenced by the bed hydrodynamics. Therefore, it is necessary to investigate the effects of parameters influencing fluidized bed hydrodynamics such as operating pressure, on the generation of electrostatic charging in such systems. The aim of this work was to investigate the effect of operating pressure (pressure varied from atmospheric to 5, 10, 15, 20 and 25 atm) on the extent of polyethylene resin charging and their degree of coating the fluidized bed vessel walls. Experiments were conducted in a high-pressure pilot plant gas-solid fluidized bed (0.15 m in diameter and 4.5 m in height) housing two online Faraday cups for particles electrostatics charge measurement. Experiments were performed in bubbling flow regime with liner low density polyethylene (LLDPE) resin directly received from commercial reactors.