287a Studies to Investigate Variables Affecting Coating Uniformity in a Pan Coating Device

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The main objective of this current work was to investigate process variables affecting weight gain coating variability (CV). The effects of pan speed, pan loading, baffle design, particle shape, and spray shape were studied. Experimental data on tablet motion was generated using a CCD camera installed inside a pan coating device. The movement of a white tracer tablet in a bed of black coated tablets was tracked using machine vision. Parameters such as circulation time, surface time, centroid location, x and y direction velocity of the tracer tablet were recorded. The data from these imaging experiments were used as an input to a MATLAB^{TM} -based code, which was developed to simulate the tablet movement using Monte Carlo techniques.

The value of CV was found to decrease with increasing pan speed. Two different spray shapes were examined to study the effect of spray shape on CV. The circular shaped spray was found to give better coating uniformity compared to the ellipsoidal shape, which is typically used in the industry to reduce the number of spray guns. Results showed that a uniform spray flux will give a lower CV in comparison to the case where spray flux varies with respect to the position of the tablet inside the spray zone. Thus this mechanistic model can be effectively used to identify and quantify variables that affect the CV.