

The influence of drum operating parameters on granulation

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ABSTRACT

Granulation is a size enlargement process which involves the movement of feed within a drum to produce granules of specific size and quality. To achieve good quality granules, the right operating parameters need to be chosen and optimised. In this study, the critical operating parameters of the drum for sinter feed granulation were investigated to optimise the drum performance for the production of high quality granules. The drum loading, rotating speed, granulation time, pre-wetting, mixing and moisture addition were investigated to enable selection of the right parameters for granulation. The batch-wise drum loading of 6-8% generated good quality granules. Also, the best drum speed was observed to be 15 revolutions per min (rpm) although the higher drum speeds (e.g. 40 rpm) showed higher bed permeability values (about 50 JPU) due to the production of large size granules, which were generally weak due to higher bed shrinkage (2.4 mm). Pre-wetting the feed with 80% of the granulation moisture at 2 min mixing of the feed prior to granulation showed good results than 60% and 100% pre-wetting. Granulation kinetics studies indicate 5 min of granulation to be the optimum residence time.