The agglomeration kernel is indeed an important parameter for modeling drum granulation processes. Not only the proper formulation of the size-independent part is needed, but also the dependency of agglomeration rate to particle size should be analyzed in order to obtain a proper model of the real plant.

6 Conclusions

In this paper, a comparative study on various model forms for representing a drum granulation process is given. Different granulation mechanisms are compared based on simulation results represented by particle size distributions and the d_{50} diameter (to reflect the average size of particles) at the influent and the effluent of the drum granulator. For the drum granulator under consideration, the simulation results lead to the following conclusions:

- Particle growth due layering has very small effect on the change of the particle sizes compared to particle binary agglomeration.
- Inclusion of the particle size dependency on the agglomeration kernel affects the mass distribution function, i.e., particles with a wider PSD and larger particles are produced compared to simulations with a constant agglomeration kernel.
- The combined process increases the growth of particles by $\sim 7\%$ (with size-independent kernel) and by $\sim 10\%$ (with size-dependent kernel) compared to a pure agglomeration process.

The choice of the agglomeration kernel directly affects the PSD of the particles. The size-independent part of the kernel should be calculated by taking into account the operational parameters of the actual drum granulator.

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