A Novel Rotary Granulation Process as an Alternative to Top Spray Granulation
K. Bellach, S. M. Engels, B. Jensen
Freund-Vector Corporation

Purpose
Rotary granulation has been viewed as a favorable granulation method in the industry due to the uniformity and round shape of the granulations produced. It has failed to gain wide use as a production method due to small batch sizes and limited drying capabilities that can lead to long processing times. A novel screened rotary fluid bed insert with dual airflows combines the large batch size and drying capacity of the top spray fluid bed process with the size and shape uniformity of the traditional rotor process.

Methods
5 kg of a blend of 70% Lactose and 30% B-820 Partially pre-gelatinized corn starch were added into an SFC-35 screened rotor insert (Freund-Vector Corporation). 2000g of a 10% PVP K-30 solution was sprayed via a tangential spray gun. The process was repeated using a standard 12L top spray fluid bed insert in a Freund-Vector Corporation VFC-3 fluid bed. The process was then repeated with a 10 KG batch size for both inserts. The resulting granulations were compared for yield, particle size distribution, aspect ratio, sphericity, flow and density.

Results
The SFC granulation resulted in a PSD between 100-400 microns with an aspect ratio of 0.85 and a sphericity value of 0.8 with a yield of 95%. The Top spray process resulted in a PSD between 150 and 850 microns with an aspect ratio of 0.71 and a sphericity of 0.71. The spray times, drying times and overall processing times were identical for each method. The SFC rotor was able to process the 10 KG batch while maintaining adequate product movement, while the top spray insert struggled to properly fluidize the large batch.

Conclusion
The SFC insert showed that it could effectively granulate large batch sizes, comparable and exceeding the capacities of a top spray fluid bed through the available size range of the SFC equipment(600L), while maintaining the size and shape advantages that a rotary process possesses. The addition of increased drying capacity through the screened section of the rotor provided equivalent drying capability to the top spray process.