

A Novel Method for Introducing Dry Powder Directly into the Spray Zone of a Bottom Spray Wurster Coating Process

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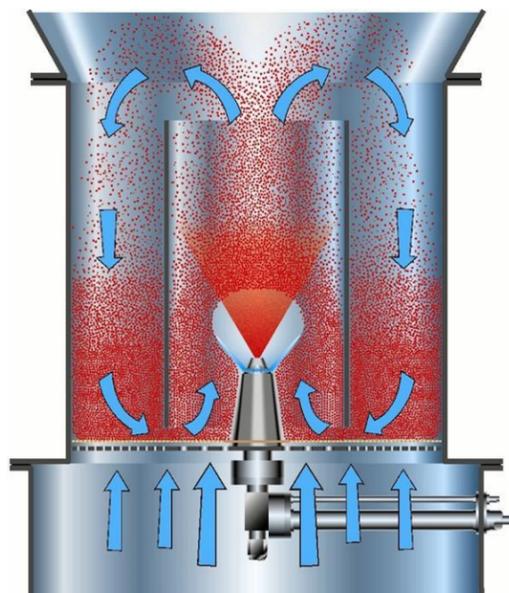
INTRODUCTION

Wurster coating of multi-particulates with polymer suspensions and solutions is widespread in the pharmaceutical industry. Several formulations for polymer coatings of aqueous dispersions and organic solvent based polymer systems require glidants such as talc to be suspended into the polymer solutions to cut down on polymer tackiness and reduce agglomeration. These glidants can fall out of solution during the process, causing gun plugging, line plugging, extended processing times and inefficient coating. This study focuses on a modification to an existing Wurster spray system to add solid glidants via a powder feeder in dry form during the Wurster coating process.

METHODS

Utilizing an 18" straight sided Wurster, (Freund-Vector Corporation) 50 KG of Potassium Chloride was coated with an 18% solids aqueous dispersion of Eudragit® L30 D 55 (Evonik). During the spray process, using a K Tron KT20 loss in weight powder feeder to precisely control the rate, talc was injected directly into the spray zone through the 45 degree Wurster Accelerator sleeve on the spray gun. Talc was applied at 50% based on the polymer solids, as instructed by the manufacturer recommendations.

EQUIPMENT



Freund-Vector VFC-60 with 18" Wurster

RESULTS

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Spray rates of up to 650 g/min were accomplished with 0% agglomeration during the coating trial. A 10% coating level was achieved in only 73 minutes of spray time at an efficiency of 90%. The talc amount applied was held at a constant 50% to the polymer solids throughout the coating run. No gun or solution line plugging occurred and no solution mixing was required during the trial.

Process Results

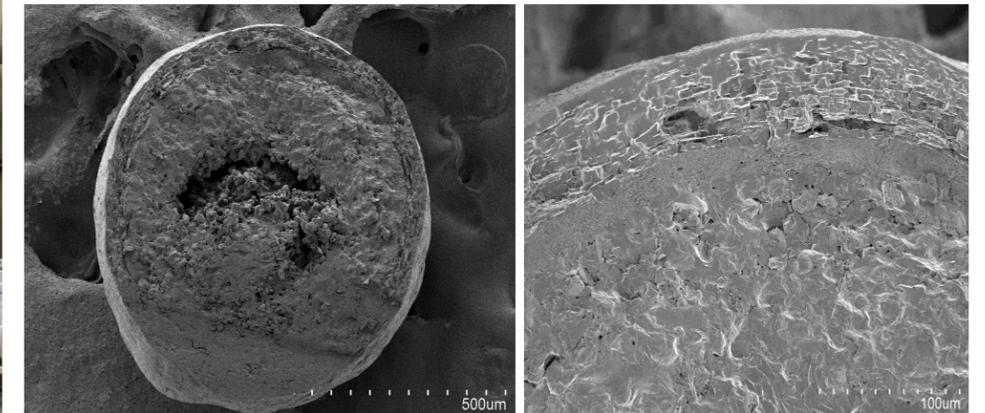
Process	Process Time	Agglomeration %	Final Particle Size (D50)	Batch Size (kg)	Yield (%)	Spray Rate (g/min)
Standard Wurster Spray Coating	110 mins	2.92	460 microns	50	95.1	Average of 350, max 450 g/min
Wurster with Dry Powder Addition	73 mins	0.71	460 microns	50	96.0	Average of 500, max 650g/min



Modified Wurster Accelerator Sleeve with talc being delivered from the 45° air holes. Mounted on a standard Freund-Vector Wurster spray gun.



In-Process picture showing 18" wurster being fed with talc by a K-Tron powder feeder.



CONCLUSIONS

Applying talc through the Wurster Accelerator sleeve directly into the spray zone allowed for increased spray rates with reduced agglomeration during the coating process. By removing the solid glidant material out of the spray solution, the need to constantly stir the solution and the potential for line plugging or gun failure during the process was eliminated.

