

A COMPARISON OF A NOVEL ROTOR PROCESSOR WITH A WURSTER PROCESSOR, SHOWING THE EFFICIENCY, UNIFORMITY AND TOTAL PROCESS TIME TO MANUFACTURE SPHERICAL OMEPRAZOLE BEADS IN THE RANGE OF 100-300 MICRONS.

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PURPOSE

To compare two processes, an established Wurster coating process for producing 100 – 300 micron Omeprazole coated beads and a Novel Rotor process for producing 100-300 micron Omeprazole coated beads to determine if advantages were present in either approach.

PROCESS EQUIPMENT



Wurster Column

Granurex GX-40

METHODS

In the Wurster layering approach micronized Omeprazole in the form of a 23 % suspension in a hypromellose solution was layered on to 100 – 300 micron Celphere ® cores using a FL-M-1 Wurster Accelerator coating system (Vector Corporation). In the comparison approach micronized Omeprazole was directly spheronized on to 100-300 micron Celphere ® cores in a Granurex GX-40 rotor processor (Vector Corporation) using hypromellose as a binder.

Each approach was formulated to result in a finished API coated bead with 30% active prior to any barrier or enteric coating.

FORMULATION

Formulation	FL-M-1 Wurster	GX-40 Granurex	
Omeprazole	320	685	G
Hypromellose	48	50	G
Celphere ®	700	1600	G
Deionized water	1226	475	G

PROCESS CONDITIONS

Parameter	FL-M-1 Wurster	GX-40 Granurex	
Batch Size			
Product Temperature	40-42	16-20	C
Air Volume	30	10	CFM
Spray Rate	5-6	10	G/Min
API Application Rate	1.2	10.5	G/Min
API Application Time	270	65	Min
Drying Time	20	40	Min
Total Process Time	295	120	Min
Yield	94.0	99.1	%
Batch Size	1071	2310	G

SCALEUP

Parameter	32" Wurster	GX-125 Granurex	
Batch Size	200	200	Kg
Product Temperature	40-42	16-20	C
Air Volume	3000	100	CFM
Spray Rate, Total	1.5	0.64	Kg/Min
API Application Rate	0.25	0.92	Kg/Min
API Application Time	237	65	Min
Drying Time	30	40	Min
Total Process Time	267	120	Min

RESULTS

Both methods produced smooth spherical beads in the desired size range. The resulting products from both methods were evaluated for particle size, sphericity, content uniformity and yield.

The results for particle size, sphericity, content uniformity and yield from both methods were comparable. Both methods produce a dense, smooth surface bead suitable for modified release coating.

The total process time to apply 30% API to a core was significantly shorter for the spheronized Omeprazole beads made in the Granurex, and the need for preparing and delivering a large quantity of API via suspension was eliminated.

Both of the products were coated with an enteric coating system (ACRYL-EZE, Colorcon), and dissolution testing performed to verify gastric resistance.

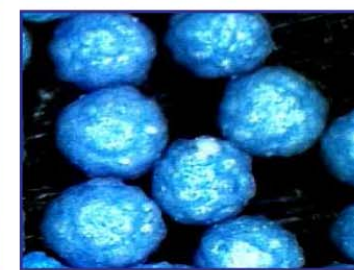
OMEPRAZOLE LAYERED BEAD STATISTICS

	Wurster	Granurex
Average Diameter	232	225
Sphericity	0.88	0.88
Aspect Ratio	0.79	0.77
Yield	94%	99.1%
Uniformity (%RSD)	1.17	1.74

APPEARANCE

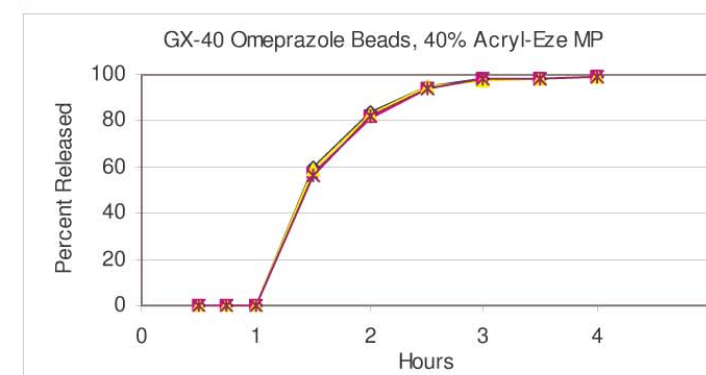


Uncoated Beads

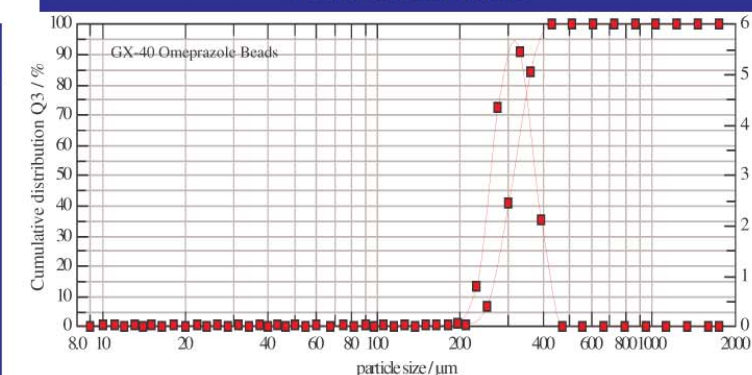


Enteric Coated Beads

DISSOLUTION



PARTICLE SIZE



CONCLUSION

An alternative processing method for the preparation of very small spherical active beads is shown. The sphericity and surface smoothness of the spheronized beads is ideal for modified release coating, and significant time savings can be achieved over traditional methods requiring the application of large volumes of active suspension.

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