Hanningfield Uni-Mill®: Improvement in Product Quality and Output for a Pharma Product

Background

Sifting is an important step in pharmaceutical product development to achieve the desired product quality and integrity. The main purpose of this step is the removal of lumps, uneven mass or foreign contamination from the product. Milling/size reduction is a mechanical process of reduction in size of particles or agglomerates. This provides multiple benefits like increased therapeutic effect of drugs with improvement in stability, dissolution and rate of absorption.

Challenge

A global pharmaceutical company (manufacturing active pharmaceutical ingredients and finished dosage forms for the international market) was experiencing challenges in sifting and milling operations during a critical process for one of their products. Small sized particles such as hair follicles could not be retained in the existing sifting equipment. This led to product contamination and further problems in product processing. In addition, the milling operation employed was dusty and caused significant product losses.

Present Approach

In the existing process, the client was using sifting equipment for security screening of the material and basic milling equipment for milling operations.

Project Goal

The main goal was to achieve the desired product output at a faster rate with minimum losses and freedom from hair follicles.

Gansons Solution

Gansons proposed conducting the trials using the Hanningfield Uni-Mill® M05-U to overcome the above-mentioned challenges. Gansons Hanningfield Uni-Mill® is a robust equipment which yields high milling throughput with in-line integration. The Uni-Mill®'s high energy efficiency generates low dust, heat and noise. In addition to these advantages, sifting and milling steps could be performed using the same equipment (Figure 1).

Figure 1: Hanningfield Uni-Mill® M05-U

Results

A series of trials were conducted to obtain the desired results. Based on the observation and experience, the process parameters were optimized. The Uni-Mill® facilitated easy removal of hair follicles as they were trapped inside the screen basket (Figure 2). Additionally, a milling output of 60-70 kg/hr was achieved (approximately 60% higher than the conventional milling system) with minimum dust generation. Hence, the client could achieve the desired particle size with improved efficiency. In addition, sifting and milling operations could be performed using the same equipment leading to reduction in process steps and project cost for the customer.

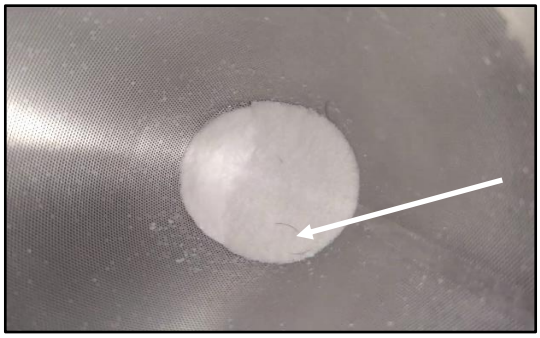

Figure 2: Entrapment of hair follicle inside the Uni-Mill® screen

Conclusion

The use of Gansons Hanningfield Uni-Mill® prevented dust generation and product loss during milling operation. In addition, the final product exhibited a uniform particle size distribution (PSD) (compared to traditional mills which show a wider size range), which would further improve product quality and performance. Also, absence of equipment changeover in Uni-Mill® contributed to reduction in number of batches and inventory for the client. Hence, the use of Gansons Hanningfield Uni-Mill® offered 80% increase in productivity and efficiency owing to negligible losses for the product.

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