PM Powder Mixer for Mixing of Hygroscopic Powder with water

Few Highlights of the Case Study

Mixing hygroscopic powder with water is a tricky process. As soon as this powder comes in contact with water, they form lumps making it almost impossible to achieve a smooth, uniform mixture, especially with standard mixers. This is where high-shear capacity pumps come into play. These pumps are specially designed to break through the challenges, ensuring the powder is mixed thoroughly without compromising its quality.

A leading client from the home care industry encountered these exact issues with their imported mixing equipment when it comes to hygroscopic powder. These mixers required frequent manual cleaning, which was time-consuming and disrupted the workflow. On top of that, the equipment lacked adequate capacity, and led to higher costs because they had to rely on imported spare parts and services. These inefficiencies caused significant downtime and made production more expensive and inconvenient. The client needed a reliable, efficient solution to streamline their operations and maintain high hygiene standards.

To tackle these challenges, the Fristam Powder Mixer turned out to be the perfect fit. This advanced equipment seamlessly dissolves, emulsifies, and homogenizes powders with liquids, simplifying the entire mixing process. Its Clean-in-Place (CIP) and Sterilize-in-Place (SIP) features eliminated the hassle of manual cleaning, ensuring top-notch hygiene while saving time. Additionally, the mixer's ability to handle different capacities gave the client the flexibility to adapt it to their production needs. By improving efficiency, reducing downtime, and cutting costs, the Fristam Powder Mixer proved to be a game-changer for the client's operations.

Where the Problems Began

The client was relying on imported European mixers, which presented several operational challenges. These mixers were not designed for Clean-in-Place (CIP), requiring time-consuming manual cleaning between batches, leading to considerable production downtime. The batch capacity of the mixers was insufficient to keep up with the client's increasing production demands. Moreover, the reliance on overseas suppliers for spare parts and services resulted in high costs and inconsistent

support. The client needed a solution that would improve cleaning efficiency, increase production capacity, and provide reliable, local service and support.

Research & Insights

The Fristam sales team engaged with the client to understand their challenges. After assessing the process parameters, production requirements, and hygiene needs in consultation with the client's R&D team, the team identified significant gaps in the existing setup.

Finding the Right Solution

Fristam proposed its Powder Mixer, tailored to address the identified issues. The solution included compatibility with CIP and SIP processes, eliminating the need for manual cleaning. The hopper lid was designed for in-line CIP during system cleaning. A range of capacities was offered to suit the plant's production requirements. Additionally, the end-to-end solution skid was locally built, ensuring timely delivery and service support through Fristam's strong network across India. This proposal solved the cleanability issue, reduced dependency on manual intervention, and aligned with the customer's capacity expansion needs.

Implementation

To validate the solution, trials were conducted at Fristam's Pune facility using samples provided by the client. The facility's setup, equipped with a tank, mixer, and control panels, allowed for comprehensive testing. Initial trials demonstrated promising results, and the client's R&D team suggested testing the mixer at varying shear rates and with different stator-rotor combinations. Multiple configurations with the help of Fristam Shear Pumps were tested to identify the most efficient setup for the application. After thorough evaluations and feedback, the optimal stator-rotor combination was finalized.

Following the installation of the Fristam Powder Mixer at the client's facility, the impact was immediate and significant. The system delivered consistent and efficient mixing results, eliminating lumps and ensuring uniformity. It also streamlined production, reduced manual intervention, and maintained high hygiene standards, all while lowering operational costs. The client confirmed an improvement in productivity and a noticeable reduction in downtime, making the Fristam Powder Mixer a key contributor to their success.

Before and After Comparison

	Before (Old Technology)	**After (Fristam Powder Mixer)**
Cleaning	Manual cleaning required, leading to production downtime.	Fully automated CIP capability, **saving 4-5 hours daily**
Spare Parts & Service Costs	Dependency on imported spares and services, costing **₹4-5 lakhs annually**	Eliminated reliance on overseas spares, reducing costs.
Production Capacity	Limited batch capacity, constraining production	Improved production capacity without manual intervention

The Way Forward

The Fristam Powder Mixer provided a reliable and efficient solution to the client's operational challenges. By addressing hygiene, capacity, and serviceability concerns, the system optimized production processes and delivered measurable improvements. The success of this project has also opened avenues for deploying similar systems in other industries and manufacturing setups. The lessons from this project highlight the importance of tailored trials and local support in building long-term partnerships.