Mayonnaise Preparation for Small Batch Production with PM Powder Mixer

One of the world's largest food and beverage manufacturers faced a production challenge. They were using a high-capacity Frymakoruma mayonnaise preparation system designed to produce 1200 kg per hour. While the system worked well for large pouch sizes of 500 g, 1 kg, and above, it was not commercially practical for small quantities or small batch orders.

The large system involved high power consumption, long processing times, and a very high capital investment of nearly ₹2 crore. For smaller production volumes, this setup resulted in inefficiencies, higher operating costs, and poor flexibility. The customer needed a compact, energy-efficient, and cost-effective solution for small batch mayonnaise preparation.

To address this, Fristam proposed a Powder Mixer (PM02) combined with the FDS Twin Screw Pump. This system was specifically recommended to handle smaller batch sizes while maintaining product quality and process reliability. Based on the purchase order, Fristam supplied the Powder Mixer system, which the customer installed and tested for mayonnaise preparation at 300 kg per hour. The trials were successful, and the system performed smoothly for small quantity production.

Where the Problems Began?

The customer's existing setup created several operational challenges:

- **Oversized system:** The 1200 kg/hr Frymakoruma system was too large for small batch production.
- **High project cost:** The system investment was approximately ₹2 crore, making it unsuitable for low-volume requirements.
- **High power consumption:** Energy usage was three to four times higher than needed for small batches.
- **Low flexibility:** The system was not commercially viable for frequent small orders.
- **Inefficient operations:** Time and resources were wasted when producing smaller quantities.

The customer needed a system that could support smaller batch sizes without compromising efficiency or quality.

Research & Insights

The Fristam team studied the customer's production needs and operational constraints.

- **Batch size analysis:** The requirement was for approximately 300 kg per hour mayonnaise preparation.
- **Cost comparison:** Large-scale systems were not economically justified for small volumes.
- **Energy assessment:** Power consumption was significantly higher than required.
- **Process flexibility:** The customer needed a system that could adapt easily to varying order sizes.

Key Insight: A compact, energy-efficient powder mixing solution would reduce costs, save energy, and offer better flexibility for small batch mayonnaise production.

Finding the Right Solution

Based on the assessment, Fristam recommended the **Powder Mixer PM02 with the FDS Twin Screw Pump**.

- **Optimized for small batches:** Designed specifically for low-volume mayonnaise preparation.
- **Lower power consumption:** Required significantly less energy compared to the existing system.
- **Cost-effective investment:** Project cost was in lakhs instead of crores.
- **Consistent product quality:** Delivered smooth and uniform mayonnaise at 300 kg/hr.
- **Flexible operation:** Ideal for handling frequent small quantity orders.

This solution directly addressed the customer's need for efficiency, flexibility, and cost control.

Implementation Process

Fristam supported the customer through the complete implementation:

- **System installation:** The PM02 and FDS pump were installed with the required setup.
- **Trial runs:** Multiple trials were conducted for 300 kg/hr mayonnaise preparation.
- **Performance validation:** The system worked satisfactorily under real production conditions.
- **Operator familiarization:** The customer's team was guided on system operation and handling.

Challenges:

- **Initial comparison with existing system:** The customer needed assurance that a smaller system could deliver the required quality.
- **Trial validation:** Successful trials helped build confidence in the Fristam solution.

Measurable Impact & Outcomes

The results clearly showed the benefits of the Fristam system:

Parameter	Frymakoruma System	Fristam PM02 + FDS
Capacity	1200 kg/hr	300 kg/hr
Project Cost	Approx. ₹2 crore	confidential
Power Consumption	Very high	Significantly lower

Suitability for Small Batches	Poor	Excellent
Time & Energy Efficiency	Low	High

Results:

- Major reduction in project investment.
- Lower power and operating costs.
- Faster and more efficient small batch production.
- Improved flexibility for varying order sizes.
- Better commercial viability for small quantity mayonnaise orders.

Lessons Learned

- **Right-sizing the system is critical:** Smaller batch production needs smaller, more efficient solutions.
- **Lower investment improves flexibility:** Compact systems reduce financial risk.
- **Energy efficiency matters:** Reduced power usage leads to long-term cost savings.
- **Trials build trust:** Live testing helped the customer gain confidence in the solution more efficiently.

The Next Steps

After the successful trials, the customer expressed interest in considering this system for future projects.

- Expanding usage for other sauces and emulsions.
- Deploying similar systems across multiple plants.
- Using the PM02 and FDS combination for pilot-scale or test batch production.
- Exploring further automation options for improved control.

Conclusion

The Fristam Powder Mixer PM02 with the FDS Twin Screw Pump provided a practical, efficient, and cost-effective solution for small batch mayonnaise preparation. By reducing project cost from crores to lakhs and significantly lowering power consumption, Fristam helped the customer achieve better flexibility and commercial efficiency.

This case study highlights how choosing the right-sized, well-engineered solution can solve real production challenges, reduce operating costs, and support evolving market demands—without compromising product quality or performance.