Vada Batter Transfer Using FDS Twin Screw Pump

Equipment Fabricators Limited (EF) is a well-known supplier of skid-mounted process systems for the food industry. EF handles complete design, engineering, and equipment supply for food processing customers. In this project, EF was working with a food industry customer in South India that manufactures ready-to-cook packaged food products, including vada batter.

The customer needed a reliable and hygienic pump for transferring vada batter to the final packaging stage. However, their existing pumping system was creating multiple production and hygiene issues. Fristam worked closely with EF to evaluate the problem and propose a better solution for batter transfer.

Where the Problems Began?

The customer was using Single Screw / Progressive Cavity (PC) pumps for vada batter transfer. Over time, this setup caused several challenges:

- **Rubber wear and contamination:** The rubber stator in PC pumps wore out continuously. Fine rubber particles mixed with the vada batter, which was not acceptable for hygienic food applications and failed by requirement of 3A and EHEDG standards.

- **High maintenance downtime:** Replacing the rubber stator took 2 to 5 hours, directly impacting daily production schedules, increased cost, and enhanced energy consumption.

- **Spillage during CIP:** When low-viscosity liquids like water were pumped during CIP, the PC pump caused frequent leakage and spillage.

- **Limited application flexibility:** The pump was not suitable for handling different products and cleaning cycles efficiently.

The customer needed a hygienic, low-maintenance pump that could handle high-viscosity batter and also perform CIP without issues.

Research & Insights

The Fristam team, along with EF, studied the application in detail.

- **Product analysis:** Vada batter viscosity ranged from 120,000 to 150,000 cP, which required a pump capable of gentle yet powerful transfer.

- **Hygiene assessment:** Rubber wear was a major risk to food safety.
- **Maintenance review:** Long stator replacement time caused frequent production loss.
- **Process requirement:** The pump needed to handle both thick batter and low-viscosity CIP fluids.

Key Insight: A hygienic twin screw pump without elastomer wear parts in the product zone would eliminate contamination risks and reduce downtime.

Finding the Right Solution

Fristam supplied an FDS 2–3 Twin Screw Pump to the EF site for trials.

- **Top suction with front discharge:** Ensured smooth and stable batter transfer.
- **High-viscosity handling:** Successfully handled vada batter with up to 150,000 cP viscosity.
- **High flow rate:** Achieved 5.7 tonnes per hour during trials.
- **No rubber wear:** Eliminated contamination risks completely.
- **CIP-friendly design:** Allowed smooth transfer of water and cleaning fluids without spillage.

The trials were successful, and both EF and the end customer were satisfied with the pump's performance.

Implementation Process

The solution was implemented in a structured manner:

- **Pump installation:** FDS 2–3 pump was installed on-site at EF's system.
- **Trial runs:** Vada batter transfer trials were conducted under real production conditions.
- **Performance monitoring:** Flow rate, pressure, viscosity and product handling were closely observed.

- **Application testing:** The pump was evaluated for both product transfer and CIP operations.

Challenges:

- **Customer hesitation:** Switching from PC pumps to a new technology required confidence.
- **Trial validation:** Successful live trials helped build trust in the FDS pump.

Measurable Impact & Outcomes

The benefits of switching to the Fristam FDS pump were clearly visible:

Parameter	PC Pump	Fristam FDS Pump
Hygiene Risk	Rubber contamination	No contamination
Maintenance Time	2–5 hours	Minimal
High-Viscosity Handling	Limited	Excellent
CIP Performance	Spillage issues	Smooth & clean
Application Flexibility	Low	High

Results:

- Eliminated rubber contamination in food products.
- Reduced maintenance time and production downtime.
- Stable and smooth transfer of high-viscosity vada batter.

- Improved hygiene and CIP performance.
- Higher confidence in long-term operation.

Lessons Learned

- **Hygienic design matters:** Removing rubber wear parts improves food safety.
- **Twin screw pumps handle versatility better:** One pump can manage batter and CIP fluids.
- **Trials build confidence:** Live testing helped the end user accept new technology.
- **Lower downtime boosts productivity:** Reduced maintenance directly improves output.

The Next Steps

Based on the successful trials, the end customer decided to consider the Fristam FDS Twin Screw Pump for future projects.

- Using the same pump for vada batter, dosa batter (20,000–30,000 cP), and CIP.
- Standardising FDS pumps in upcoming food processing lines.
- Replacing PC pumps in future installations.
- Expanding usage across other ready-to-cook food applications.

Conclusion

The Fristam FDS Twin Screw Pump proved to be a reliable, hygienic, and low-maintenance solution for vada batter transfer. By eliminating rubber contamination, reducing maintenance downtime, and improving CIP performance, the pump addressed all key challenges faced by the customer.

This case highlights how choosing the right pump technology can improve hygiene, increase uptime, and support flexible food processing operations. With its ability to handle multiple products and cleaning cycles, the Fristam FDS pump set a new benchmark for batter transfer applications in the food industry.