Boosting Homogenous & Lumps Free Shear-Sensitive Product using Fristam High Shear Pump (FSP) and Low Shear Stator-Rotor Combination 2020

Meta Title: Get Homogenous & Lumps free Shear-Sensitive Product with Fristam High Shear Pump and Low Shear Stator-Rotor Combination 2020.

Meta Description: Discover how the Fristam High Shear Pump (FSP) and a low shear stator-rotor combination enhance the blending of shear-sensitive products. Learn innovative techniques for producing consistent and repeatable results.

A Few Highlights of the Case Study

A major personal care product customer struggled to obtain accurate mixing outcomes for a shear-sensitive formulation applied in high-end cosmetic products. The client was dependent on a traditional mixing system that was imprecise, resulting in variable product quality, extended production cycles, and damaged visual appearance.

To solve these problems, the company installed Fristam's High Shear Pump (FSP) with a Low Shear Stator-Rotor Combination 2020. This solution successfully enhanced mixing efficiency, minimized the shear effect, homogenous & Lumps free end results and maximized the product's signature shiny glaze finish — an important quality factor for their final product with consistent and repeatable results.

Where the Problems Began?

Customer was employing a conventional agitator and circulation-based mixing system. This conventional approach was unable to fulfill the quality requirements for their high-end cosmetic product because of the following issues:

- **Poor Mixing Effect:** The traditional system could not produce an even mix, leading to product inconsistency.
- **Shear Sensitivity Problems:** Because of the product's sensitivity, excessive shear caused unwanted texture and appearance changes.

- **Prolonged Production Time:** The current process took 6 hours to produce one batch, reducing production output.
- **Substandard Product Quality:** The finished product did not have the characteristic shiny glaze effect, a critical quality requirement for the client.

The customer required a custom mixing solution to provide efficient output while maintaining the product's soft nature.

Research & Insights

The technical team at Fristam reviewed the mixing inefficiencies in meticulous detail to isolate the underlying root causes. The most important steps included:

1. **Process Analysis:** The team scrutinized the customer's current process, analyzing the flow patterns, shear effect, and mixing function.
2. **Analysis of Sample:** Fristam tested the viscosity and shear-force sensitivity of the product.
3. **Client R&D Team Consultation:** Data from the client's technical specialists indicated that ensuring a low-shear environment was essential to uphold the product's texture and finish appearance.

Looking at the results, it was apparent that a normal high shear mixing profile would destroy the product, and needed a tailored solution.

Finding the Right Solution

Our team of highly qualified experts suggested the use of the Fristam High Shear Pump (FSP) with a Low Shear Stator-Rotor Combination 2020. This cutting-edge combination was particularly developed for working with high-viscosity, shear-sensitive material.

Key Features of the Proposed Solution:

✓ Low Shear Stator-Rotor Combination 2020 to ensure gentle yet efficient mixing.
✓ Engineered for high-viscosity product transfer without interfering with product integrity.
✓ Improved flow control to enhance blending effectiveness while ensuring product quality.
✓ Designed to achieve the shiny glaze effect — a primary visible indication of product quality.

Implementation Process

The implementation process involved the following principal steps:

1. Custom Equipment Procurement: Fristam imported the Low Shear Stator-Rotor Combination 2020 from Germany to provide accurate performance.

2. On-Site Setup & Integration: The Fristam FSP pump was installed in addition to the client's current infrastructure to provide an easy transition.

3. Testing & Optimization: The system was thoroughly tested to confirm the intended mixing effect. The first trials verified that the specially designed rotor-stator set efficiently minimized shear while providing the best product uniformity.

4. Operator Training: Fristam's technical specialists conducted on-site training for the client's production staff to ensure optimal equipment use and maintenance.

Challenges & Solutions

Challenge 1: Client's initial reluctance to make the change from the traditional system.
Solution: Fristam provided a trial run to enable the client to test the enhanced outcomes for themselves, earning their confidence and trust.

Challenge 2: Achieving a balance between mixing intensity without compromising shear-sensitive properties.
Solution: By adjusting the stator-rotor clearance sensitively and refining flow rates to optimize them, our team was able to hit the exact mark of gentle blending and efficient blending.

Measurable Impact & Results

With the successful installation of the Fristam High Shear Pump (FSP) with Low Shear Stator-Rotor Combination 2020, the client achieved remarkable efficiency as well as product quality improvements.

Parameter	Before (Old System)	After (Fristam FSP System)
Production Time	6 hours	**3.5 hours** (40% faster)
Product Appearance	Dull, uneven finish	**Shiny glaze effect achieved**
Mixing Consistency	Inconsistent	**Uniform and smooth texture**

Maintenance Frequency	Frequent breakdowns	**Minimal maintenance required**
Production Efficiency	Slow batch cycles	**Increased throughput**

Major Outcomes

1. Reduced by 40% production time.
2. Improved and consistent product quality with better visual appearance
3. Reduced shear effect, maintaining product characteristics.
4. Obtained absolute Homogenous end products with lumps free results.
5. Lower maintenance expenses with enhanced equipment reliability.
6. Enhanced client trust in Fristam's tailored solutions.

Lessons Learned

1. **Tailored Solutions Deliver Results:** Customizing the stator-rotor combination for shear-sensitive products to meet specific needs guarantees the best performance.
2. **Trial Runs Foster Trust:** Offering a demonstration allowed the client to test performance before investing in a full-scale implementation.
3. **Balancing Shear & Efficiency is Paramount:** Sensitive tuning of flow rates and rotor-stator clearance preserved product quality while increasing mixing efficiency.

The Way Forward

Impacted by the enhanced output and shorter production time, the client has since taken steps to modernize more production lines with Fristam's High Shear Pump (FSP) with the Low Shear Stator-Rotor Combination 2020.

With improved product quality, reduced costs, and enhanced efficiency, this solution has set a new standard for the client’s mixing processes — ensuring they continue to deliver high-quality products with a distinctive shine and superior consistency.