

Prolong Plus No. 598 Permeate Processing Case Study

Processing Aid Improves Permeate Throughput and Reduces Dryer & Evaporator Disruptions at a Dairy Producer

Challenge

A dairy producer processing blended milk ultrafiltration (UF) permeate and whey UF permeate began experiencing significant operational issues as higher volumes of milk UF permeate entered the system. The changing permeate composition led to increased calcium precipitation throughout the process. The resulting buildup created challenges including:

- Excessive calcium precipitate sludge buildup in concentrated permeate storage silos
- Evaporator plugging and premature fouling
- Additional water flushes during production runs
- Product clumping in the dryer
- Bridging in baghouses
- Lost production capacity and occasional disposal of excess permeate

Operational Challenge	Impact
Calcium sludge buildup	✗ Evaporator interruptions
Evaporator fouling	✗ More flushes and CIP events
Dryer clumping	✗ Reduced throughput
Baghouse bridging	✗ Product handling issues
Lost processing capacity	✗ Excess permeate diverted

Solution

Initial trials focused on applying the Hydrite processing aid **Prolong Plus No. 598** upstream of evaporation to improve evaporator performance. As testing progressed, a second treatment point was added earlier in the process to address calcium sludge formation in concentrated permeate storage. The resulting dual-point treatment strategy improved performance across multiple areas of the operation:

The optimized treatment approach was designed to:

- Keep calcium precipitates suspended and reduce sludge accumulation
- Improve evaporator performance
- Maintain product flow through drying operations
- Improve overall process stability

Through ongoing optimization, **processing aid consumption was reduced by 60%** of the original usage rate, while maintaining performance.

Results

This customer trial demonstrated that a targeted, dual-point processing aid strategy can effectively enhance permeate processing under increasingly complex operating conditions. By reducing calcium precipitate sludge accumulation in concentrated permeate storage, improving evaporator run times, and eliminating dryer and baghouse disruptions, the optimized approach restored consistency and throughput across the entire permeate concentrating and drying process.

Major Operational Improvements

Performance Area	Result
Calcium sludge accumulation	✔ Reduced to manageable levels
Evaporator operation	✔ Consistent 20-hour production runs
Mid-run interruptions	✔ Significantly reduced
Dryer clumping	✔ Reduced or eliminated
Baghouse bridging	✔ Reduced or eliminated
Permeate disposal	✔ Significantly reduced

Prolong Plus No. 598 provides a sustainable and scalable solution for managing high calcium permeate streams in modern UF, reverse osmosis (RO), evaporation, and drying environments.



Providing Creative Solutions

FOR MORE INFORMATION:
HYDRITE
17385 GOLF PARKWAY
BROOKFIELD, WI 53045

WWW.HYDRITE.COM
262-792-1450
INFO@HYDRITE.COM