



# CASE STUDY

## Field Performance of Apollo No. 327 in Microfiltration System

### INTRODUCTION

Nonylphenol ethoxylate (NPE) surfactants have historically been used for their ability to effectively emulsify fats and other soils in a cost-effective manner. These surfactants are also good wetting agents, reducing cleansing solutions surface tensions for more effective surface and soil contact. Recently, NPE surfactants have come under increased regulatory pressure, with overseas markets limiting residual NPE concentrations in finished products to 10 ppb. Due to these regulations, dairy producers are looking for cleaners and sanitizers formulated without nonylphenol ethoxylate for dairy membrane fractionation systems.

**Apollo No. 327**, Hydrite's new membrane surfactant, does not contain NPE. Instead, Apollo No. 327 is a blend of nonionic ethoxylated surfactants.

### CHALLENGE

Hydrite focused on evaluating the efficacy of cleaning by measuring the impact on production performance using the microfiltration (MF) system at a cheese and whey protein manufacturer. A comparison of cleaning effect will be determined objectively by using the key evaluation metrics, such as production system feed rates, flux rates, and baseline pressure, as well as clean water flux (CWF) post CIP.

### GOALS

- To validate that the Apollo No. 327 can maintain performance of the MF system at any use rate
- Systematically reduce the usage to determine the optimal usage rate without sacrificing system performance.

### SOLUTION & RESULTS

The test system chosen for Apollo No. 327 validation was considered to be the most difficult to clean membrane unit on site by the facility. Through systematic evaluation and usage reduction, the optimized usage rate of Apollo No. 327 on the MF system was realized and a 25% lower use-rate than the incumbent phenol-based surfactant product was achieved. The system performance metrics showed that the operations and production of the membrane system were maintained in excellent condition despite the reduced usage rates (Figure 1). Apollo No. 327 also demonstrated the ability to recover the membrane system even after power outages affected the production systems during the trial, producing difficult cleaning conditions and high soil load.

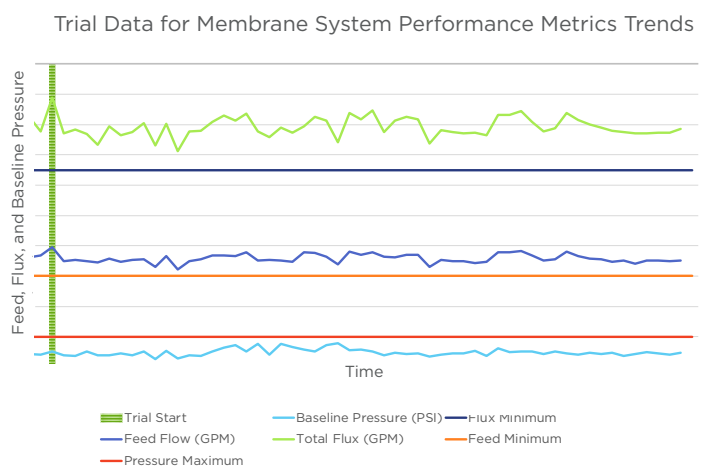


Figure 1: Data from Apollo No. 327 trial. Disclaimer: These results were under test conditions and results may vary.

## VALUE CREATED

- Better fat-cleaning, leading to more efficient usage rates
- Usage rates reduced by 25%

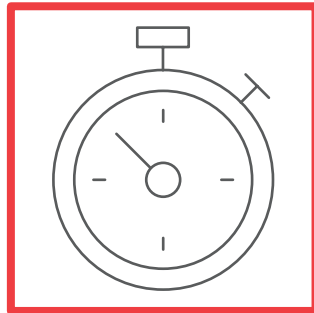
## CONCLUSION

Apollo No. 327, made from biodegradable chemistry, has improved cleaning efficiency and has demonstrated no negative impact on finished flavor. This product is free-rinsing and resulted in reduced usage while maintaining production and cleaning performance on the most challenging membrane system on site.

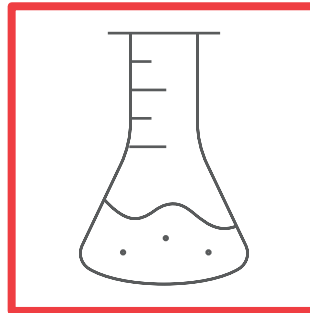
### Adding Value Through Innovation



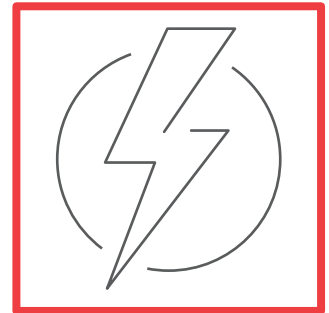
**Water**



**Time**



**Chemistry**



**Energy**

The membrane sanitation program from Hydrite represents the culmination of 30 years of research and development. We've listened to our customer's concerns regarding membrane sanitation, and understand the impact your membrane processes have on throughput and productivity. Our objective is to clean the membrane effectively and quickly, to keep your process running smoothly.

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