



CASE STUDY

Carbonaceous soil removal using **Boss 302** in high heat applications

INTRODUCTION

Current State: A Midwestern powdered milk product facility experiences a buildup of organic and inorganic soils in the evaporator tubes.

Outcome: A new CIP cleaning program using Boss 302 removed this build up.

CHALLENGE

A Midwestern powdered milk product facility was running a mix of deproteinized whey and condensed milk through its evaporator. The plant was following a typical whey protein evaporator cleaning procedure with an acid first wash. This procedure was developed when the plant was exclusively running whey protein. The new product mix caused a buildup of organic and inorganic soils to form in the evaporator tubes. Over time, the heat of the evaporator cooked on the soil, causing carbonaceous soil build-up. Typical acid and caustic washes failed to remove the buildup, resulting in a loss of efficiency and food safety concerns with increased counts observed by the quality department.



Figure 1. Carbonaceous soil build up in an evaporator tube.

GOALS

Account personnel unsuccessfully attempted to remove the soil with a variety of cleaning methods.

Method	Results
Concentrated Acid/Caustic CIP Circuit	Soil Removal: Poor
Pneumatic Tool	Soil Removal: Good-Could not reach all soil within evaporator tubes

Following these unsuccessful methods, the field account personnel looked to Hydrite’s Technical Services & Development lab for new product formulation. The lab formulated Boss 302, a solvent and surfactant blended product that was intended to boost the caustic wash cycle and effectively penetrate carbonaceous soil buildup.

VALUE CREATED

Successful carbonaceous buildup removal leads to increase in quality metrics.

SOLUTION & RESULTS

Account personnel implemented a new CIP cleaning program at the plant that called for periodic use of a 2-3% caustic wash, boosted with Boss 302, and followed by a 2% acid wash, a procedure which removed large pieces of soil during the wash cycle. **(Figure 2).**



Figure 2. Cross-Section of carbonaceous scale build up.



Figure 3. Evaporator tubing post treatment with Boss 302.

Tubes were scoped following cleaning **(Figure 3)**, confirming that the carbonaceous soil was successfully removed from the evaporator. The quality department noted a corresponding improvement in quality metrics following the soil removal.

CONCLUSION

Boss 302 is an effective booster chemistry that can help remove burnt-on carbonaceous soils in high heat applications. It should be used in conjunction with a caustic wash, followed by an acid wash.

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