VertKleen CR and HCR Brewery Trial at Brewlando Brewing

PURPOSE: To test VertKleen CR and VertKleen HCR as a replacement for Caustic Soda and conventional Acid blends respectively. The test was conducted using the CIP method in a Mash Tank and Heat Exchanger.

SAFETY: Prior to mixing any chemicals, we confirmed brewing personnel had the necessary PPE. All valves and discharge lines were inspected and verified for leakage and in the correct positions.

PROCEDURES: The concentration of VertKleen CR and HCR used for cleaning the tank remained the same, as the existing treatment of Caustic Soda and Acid blend being used.

VertKleen CR CIP run

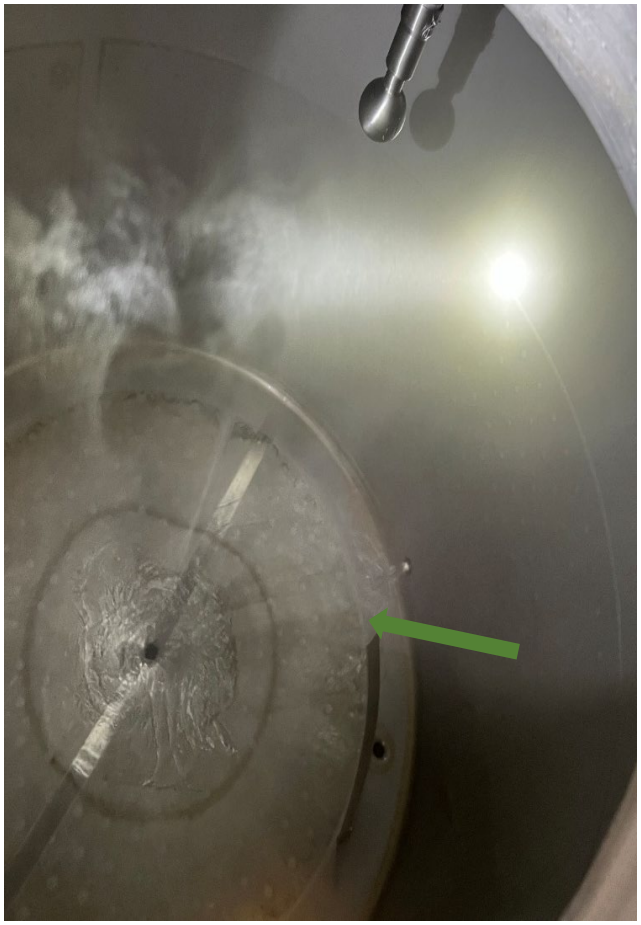
- Mash Tank was **NOT CIP** cleaned with Caustic Soda or Acid blend for around 10 days after IPA beer production. This resulted in a mash residue ring around the top of the tank and heavy deposits at the bottom.
- 5 Liters of VertKleen CR was mixed into 55 gallons of water at 160-170 degrees Fahrenheit and allowed to mix for 1 minute.
- The mixture of VertKleen CR and hot water was allowed to circulate in a close loop for 25 minutes through the tank and the heat exchanger.
- The Brewmaster then checked the Mash tank and determined it was very clean after the allotted time. Any other organic residue was easily washed away with a hose.
- The Heat exchanger was drained, and it was observed the effluent was very clean.

Before- Treatment with VertKleen CR

After beer stone exposed now and ready for HCR CIP

VertKleen HCR CIP/SIP run

- 5 liters of VertKleen HCR was added to 55 gallons of water at 160-170 degrees Fahrenheit and allowed to mix for 1 minute.
- The mixture of VertKleen HCR and hot water was allowed to circulate and jet wash for a total of 30 minutes.
- The tank was rinsed and drained. After draining the tank, it was thoroughly cleaned from residue, beer stones and impurities. See pictures below:



No residue present, after a CIP with VertKleen HCR and CR

RESULTS after Clean and Sanitized:

VertKleen CR and HCR worked better than traditional Caustic Soda and Brewing Acid Blends in the cleaning process for the Mash Tank and Heat Exchanger at Brewlando Brewing. For comparison, the concentration of VertKleen CR and HCR was kept at the existing level, together with the same CIP time. The Heat Exchanger was thoroughly cleansed from water deposits and other debris as indicated from the clean effluent at the end.

The performance of our products together with their **non-fuming, non-corrosive properties and Triple Zero formulations** are a perfect reason for Brewlando to consider switching to **VertKleen Chemicals.** This will ensure that their staff operate in a safe environment without hazardous chemicals and reduce overall risk for the operation.

They will eventually be using less concentration once dosage ratings are altered to suit maximum efficiency in the CIP process.