

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2024

DateRun: 12/16/2024

Experimenters: Amelia Wagner

ClientType: Lab

ProjectNumber: Project #13

Substrates: Stainless Steel

PartType: Part

Contaminants: Food

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To test the efficacy of safer alternatives to caustics in removing encrusted yeast and hops from stainless steel coupons.

Experimental Procedure: Stainless steel coupons were chosen and had their initial weights recorded before beginning the 'brewing' process. To begin the 'brewing process' a slurry of 1.5 lbs of dry malt extract and warm water was made and added to 2 gallons of boiling water in the brewing pot. An entire packet of hops was then added to the brewing pot and continued to boil for ~1 hour until wort was created. The wort was allowed to cool to room temperature before transferring it into the plastic fermentation bucket. 6-7 grams of dry yeast was rehydrated with a small amount of warm water, and was left to rest for 5 minutes. The dry yeast mixture was then added into the fermentation bucket (without stirring). The coupons were hung in the fermentation bucket with fishing line so that the bottom of each coupon sat just above the wort level. The fermentation bucket was covered and left to ferment for 72 hours, checking for yeast activity every day. Once the coupons were removed, they were baked in the oven at 250F to fully solidify the yeast and hops soil to the surface. At this point, the dirty weights of the coupons were then recorded.

To clean, the coupons were subjected to 10 minutes of immersion in their respective cleaners with a stir bar set to 300rpm. After cleaning, each coupon was rinsed with tap water for 10 seconds. After allowing the coupons to air dry, the clean weights were recorded.

| Cleaner | Temp | Initial wt of cont. | Final wt of cont. | %Cont Removed | % AVG |
|----------------------------------|----------|---------------------|-------------------|---------------|-------|
| Vidivis ICT 2% | Unheated | 0.0057 | 0.0010 | 82.46 | 75.55 |
| | | 0.0089 | 0.0020 | 77.53 | |
| | | 0.0015 | 0.0005 | 66.67 | |
| Virdivis ICT 2% | 120F | 0.0019 | 0.0003 | 84.21 | 85.67 |
| | | 0.0116 | 0.0016 | 86.21 | |
| | | 0.0112 | 0.0015 | 86.61 | |
| BevSafe Line and Tank Cleaner 2% | Unheated | 0.0043 | 0.0004 | 90.70 | 91.91 |
| | | 0.0094 | 0.0003 | 96.81 | |
| | | 0.0051 | 0.0006 | 88.24 | |
| BevSafe Line and Tank Cleaner 2% | 120F | 0.0127 | 0.0000 | 100.00 | 95.59 |
| | | 0.0088 | 0.0004 | 95.45 | |
| | | 0.0046 | 0.0004 | 91.30 | |

Summary:

| | | | | | | |
|--------------------------------------------|--|-------------------------------------------|--------|-------------|-------------------------------------|---------------|
| Substrates: | | Stainless Steel | | | | |
| Contaminants: | | Food | | | | |
| Company Name: | | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Innovative Chemical Technologies, Inc. | | Virdivis FB1000 (ICT 1648L) | 2% | 75.55 | <input type="checkbox"/> | |
| Innovative Chemical Technologies, Inc. | | Virdivis FB1000 (ICT 1648L) | 2% | 85.67 | <input checked="" type="checkbox"/> | |
| Environmental Manufacturing Solutions, LLC | | BevSafe CR (Beverage Line & Tank Cleaner) | 2% | 91.91 | <input checked="" type="checkbox"/> | |
| Environmental Manufacturing Solutions, LLC | | BevSafe CR (Beverage Line & Tank Cleaner) | 2% | 95.59 | <input checked="" type="checkbox"/> | |

Conclusion:

CLEANING LABORATORY EVALUATION SUMMARY

Virdivis ICT 2% was successful in removing encrusted yeast and hops when subjected to heated immersion, but gave an inconsistent performance when subjected to unheated immersion. The BevSafe Line and Tank Cleaner 2% was successful in removing encrusted yeast and hops with unheated immersion and highly successful using heated immersion at 120F.

Next steps for testing are to test the Virdivis ICT at a higher concentration and testing the 2% concentration with a longer cleaning time. The BevSafe Line and Tank cleaner can be tested at a lower concentration.