

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2023
 DateRun: 07/17/2023
 Experimenters: Amelia Wagner
 ClientType: Food Manufacturer
 ProjectNumber: Project #2
 Substrates: Stainless Steel
 PartType: Coupon
 Contaminants: Oil, Food
 Cleaning Methods: Ultrasonics
 Analytical Methods: Gravimetric

Purpose: To test the effectiveness of ENZO NRF cleaner in comparison to current cleaner 5229 AFCO LF and LFE Enzymatic cleaner that was previously tested and found successful.

Experimental Procedure: Six stainless steel coupons were used for each cleaner, three being the 304 alloy and three being the 316 alloy, for a total of 18 coupons. The initial weights of each coupon were taken. The coupons were then soiled with Cedar's Chocolate Hummus by wiping a thin layer, but leaving some chunky spots, on the bottom half of the substrate. A heat gun was applied to each coupon at its highest temperature for 2 mins each to mimic the pasteurization process that happens within the mixing tanks, allowing the soil to better adhere to the coupons. After the coupons cooled, their dirty weights were taken. Six coupons (three 304 and three 316) were subjected to heated ultrasonics using 5229 AFCO LF 1.1% for 20 mins at 160F. Six coupons (three 304 and three 316) were subjected to heated ultrasonics using LFE Enzymatic Cleaner 2.5% for 20 mins at 130F. The last six coupons (three 304 and three 316) were subjected to heated ultrasonics using ENZO NRF 2% for 20 mins at 90F. The coupons then were left to air dry before clean weights were taken.

Results:

| Cleaner | Soil | Substrate | Initial wt of cont. | Final wt of cont. | %Cont Removed | % AVG | % Overall |
|---|-----------------|---------------------------------|---------------------------|-------------------------|------------------|----------|--------------|
| 5229 AFCO LF 1.1% @ 160F | Choco Hummus | Stainless Steel Alloy 304 | 0.1381 | 0.0134 | 90.30 | 80.94 | 74.69 |
| | | | 0.0887 | 0.0278 | 68.66 | | |
| | | | 0.0942 | 0.0152 | 83.86 | | |
| | | Stainless Steel Alloy 316 | 0.1033 | 0.0338 | 67.28 | 68.45 | |
| | | | 0.0714 | 0.0351 | 50.84 | | |
| | | | 0.2918 | 0.0373 | 87.22 | | |
| LFE Enzymatic Cleaner 2.5% @ 130F | Choco Hummus | Stainless Steel Alloy 304 | 0.1939 | 0.0023 | 98.81 | 99.25 | 98.92 |
| | | | 0.2546 | 0.0020 | 99.21 | | |
| | | | 0.3370 | 0.0009 | 99.73 | | |
| | | Stainless Steel Alloy 316 | 0.2825 | 0.0076 | 97.31 | 98.59 | |
| | | | 0.3168 | 0.0042 | 98.67 | | |
| | | | 0.2388 | 0.0005 | 99.79 | | |
| ENZO NRF 2% @ 90F | Choco Hummus | Stainless Steel Alloy 304 | 0.0477 | 0.0005 | 98.95 | 98.41 | 96.31 |
| | | | 0.0336 | 0.0003 | 99.11 | | |
| | | | 0.0353 | 0.0010 | 97.17 | | |
| | | Stainless Steel Alloy 316 | 0.0465 | 0.0019 | 95.91 | 94.21 | |
| | | | 0.0373 | 0.0015 | 95.98 | | |
| | | | 0.0302 | 0.0028 | 90.73 | | |

Summary:

Conclusion: ENZO NRF 2% @ 90F is an effective cleaner and is comparative to LFE Enzymatic Cleaner using a lower concentration and less heat.