

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004
 DateRun: 12/17/2004
 Experimenters: Jason Marshall
 ClientType: General
 ProjectNumber: Project #1
 Substrates: Stainless Steel
 PartType: Coupon
 Contaminants: Oil, Starch
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric

Purpose: To evaluate products on client contaminated coupons.

Experimental Procedure: Three products from the previous trials were diluted with DI water to vendor suggested concentration. The products were then heated to 160 F on a hot plate.

The pre-contaminated stainless steel coupons were weighed to determine the amount of oil/starch was applied during the week long process. Three coupons were cleaned in each product for 30 minutes total using stir bar agitation. Cleaning was followed by a 15 second rinse in a tap water bath at 120 F and air blow off for 30 seconds at room temperature. Once dry, coupons were weighed a third time and efficiencies were calculated for each product tested.

Results: The client's current cleaner removed over 96% of the applied oil/starch mix which was what the Organic Cleaner/Degreaser was at 25%. The diluted alternatives removed under 60% of the mix during the 30 minute cleaning process at 160 F. The table below lists the amount of soil added, the amount remaining and the percent removed for each coupon cleaned.

| Cleaner | Initial wt | Final wt | % Removed |
|---------------------------|------------|----------|-----------|
| Liquid Chembrite | 0.1188 | 0.0004 | 99.66 |
| | 0.0790 | 0.0003 | 99.62 |
| | 0.2087 | 0.0189 | 90.94 |
| Organic Cleaner/Degreaser | 0.1303 | 0.0369 | 71.68 |
| | 0.3011 | 0.2337 | 22.38 |
| | 0.1263 | 0.0537 | 57.48 |
| VPW SC 1000 | 0.1204 | 0.0555 | 53.90 |
| | 0.1452 | 0.0543 | 62.60 |
| | 0.1363 | 0.0510 | 62.58 |
| Liquid Chembrite | 0.3564 | 0.0118 | 96.69 |

Summary:

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|--|--|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Stainless Steel | | | | |
| Contaminants: | Oil, Starch | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Rochester Midland Corporation | Liquid Chembrite | 3 | 96.24 | <input checked="" type="checkbox"/> | |
| 1st Envirosafety Inc. - No Longer Exists | Organic Cleaner/Degreaser - For Comparison Purposes Only | 2.5 | 50.52 | <input type="checkbox"/> | |
| Orison Marketing | VPW SC 1000 | 5 | 59.70 | <input type="checkbox"/> | |

Conclusion: The three products will be used at 200 F for one hour of immersion cleaning using the heavily soiled supplied coupons. The Organic/Degreaser will be used at 5% in stead of 2.5%. (The one coupon from this trial that was very contaminated, 0.3011g, will be cleaned using the 2.5% solution).