

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2003
 DateRun: 01/28/2003
 Experimenters: Jason Marshall
 ClientType: Manufactures parts for Semi-Conductor Industry
 ProjectNumber: Project #1
 Substrates: Ceramics
 PartType: Coupon
 Contaminants: Waxes
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric
 Purpose: To evaluate cleaners on third supplied wax

Experimental Procedure: Two products were selected from the laboratories database of testing results based on client supplied data. Four other products were also selected based on success in previous trials. All six semi-aqueous products were used at full strength in 600 ml beakers. The products were heated to 130 F on a hot plate. Eighteen preweighed ceramic coupons were coated with client supplied Roger Reed 6816 wax. The wax was first melted using a Master Appliance heat gun in a beaker and applied to the coupons using a swab. The coupons were allowed to cool to room temperature before weighing a second time. Three coupons were cleaned in each solution for 5 minutes using stir-bar agitation. Coupons were rinsed in tap water for 15 seconds at 120 F, followed by air blow off at room temperature. Once dry, coupons were weighed a final time and efficiencies for each cleaner were calculated.

Results: Three of the six products removed over 89% of the wax from the ceramic coupons within 5 minutes. Two other products removed over 76% of the wax. These five products would remove all the wax in an extended cleaning time. Only one product was not successful in removing a majority of the wax, removing just over 28%. The table below lists the amount of wax applied and removed.

Table 1. Wax Removal

| Cleaner | Initial wt | Final wt | % Removed |
|-------------------|------------|----------|-----------|
| Opti Clear | 0.4842 | 0.0349 | 92.79 |
| | 0.3319 | 0.0135 | 95.93 |
| | 0.2640 | 0.0039 | 98.52 |
| Citrikleen XPC | 0.3635 | 0.1034 | 71.55 |
| | 0.4748 | 0.1237 | 73.95 |
| | 0.3579 | 0.0470 | 86.87 |
| Bio T 200 A | 0.4089 | 0.0266 | 93.49 |
| | 0.4108 | 0.0296 | 92.79 |
| | 0.4497 | 0.0209 | 95.35 |
| Citriburst 7 | 0.4956 | 0.0555 | 88.80 |
| | 0.5371 | 0.1094 | 79.63 |
| | 0.3894 | 0.0033 | 99.15 |
| Canola Gold CE110 | 0.5110 | 0.2635 | 48.43 |
| | 0.4200 | 0.2943 | 29.93 |
| | 0.3751 | 0.3528 | 5.95 |
| D Greeze 500 Lo | 0.4606 | 0.1175 | 74.49 |
| | 0.4950 | 0.1397 | 71.78 |
| | 0.4872 | 0.0759 | 84.42 |

Summary:

| Substrates: | Ceramics | | | | |
|---------------------------|-------------------|--------|-------------|-------------------------------------|---------------|
| Contaminants: | Waxes | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| National Diagnostic | Opti Clear | 100 | 95.75 | <input checked="" type="checkbox"/> | |
| Pentone Corporation | Citrikleen XPC | 100 | 77.46 | <input type="checkbox"/> | |
| Bio Chem Systems | Bio T 200 A | 100 | 93.88 | <input checked="" type="checkbox"/> | |
| AG Environmental Products | Canola Gold CE110 | 100 | 28.10 | <input type="checkbox"/> | |

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|--------------------------|-----------------|-----|-------|-------------------------------------|--|
| Transene Company, Inc. | D Greeze 500 LO | 100 | 76.90 | <input type="checkbox"/> | |
| Florida Chemical Company | Citrus Burst 7 | 100 | 89.20 | <input checked="" type="checkbox"/> | |

Conclusion:

The three products that removed over 89% and the two that removed over 76% will be used in the next trial on the fourth wax.