

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2002
 DateRun: 09/19/2002
 Experimenters: Jason Marshall
 ClientType: Adhesive Manufacturer
 ProjectNumber: Project #2
 Substrates: Ceramics
 PartType: Coupon
 Contaminants: Coatings
 Cleaning Methods: Mechanical Agitation
 Analytical Methods: Gravimetric

Purpose: To evaluate mechanical agitation with successful cleaner

Experimental Procedure: One product from the previous trial and three additional products were used at full strength in 300 ml beakers at room temperature. Two other products from the previous trial were used at a 10% dilution. Eighteen preweighed coupons were coated with Anderson Development Co Escoat P-20 carbamic ester/aromatic hydrocarbon coating (108-88-3) using a hand held swab. Coupons were allowed to dry for two hours at room temperature. Once dry, a second weighing was performed to determine the amount of contaminant that was applied.

Three coupons were immersed in each solution and agitated by lifting the coupons up and down at room temperature for 5 minutes. Following cleaning, coupons were rinsed in a tap water bath for 15 seconds and dried using air knives for 2 minutes both at room temperature. Once dry, coupons were weighed a final time and efficiencies were calculated. Coupons were wiped and weighed again and a second efficiency was calculated.

Results:

| Agitated Cleaning | | | | |
|----------------------|----------|----------|----------|---------|
| Cleaner | Coupon 1 | Coupon 2 | Coupon 3 | Average |
| Solsafe 245 | 97.43 | 97.04 | 97.01 | 97.16 |
| Citriburst 7 | 94.10 | 99.25 | 98.03 | 97.13 |
| Canola Gold 110 | 23.58 | 25.18 | 61.98 | 36.91 |
| Citrikleen XPC | 98.49 | 98.74 | 98.14 | 98.46 |
| Shopmaster FF | 82.17 | 94.15 | 94.64 | 90.32 |
| Beyond 2006 | 94.09 | 86.97 | 97.94 | 93.00 |
| Manual Wipe Cleaning | | | | |
| Cleaner | Coupon 1 | Coupon 2 | Coupon 3 | Average |
| Solsafe 245 | 99.52 | 100.35 | 99.04 | 99.63 |
| Citriburst 7 | 97.94 | 99.63 | 99.16 | 98.91 |
| Canola Gold 110 | 84.13 | 82.16 | 89.54 | 85.28 |
| Citrikleen XPC | 99.06 | 99.11 | 99.1 | 99.09 |
| Shopmaster FF | 96.61 | 99.38 | 99.07 | 98.35 |
| Beyond 2006 | 97.9 | 97.14 | 99.56 | 98.20 |

All but one cleaner were also successful with mechanical agitation alone. All six products were successful when wiped three quick times with a paper towel.

Summary:

| Substrates: | | Ceramics | | | | |
|---------------------------|-------------------|----------|-------------|-------------------------------------|---------------|--|
| Contaminants: | | Coatings | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: | |
| Bio Chem Systems | Solsafe 245 | 100 | 99.63 | <input checked="" type="checkbox"/> | | |
| Florida Chemical Company | Citrus Burst 7 | 100 | 98.91 | <input checked="" type="checkbox"/> | | |
| AG Environmental Products | Canola Gold CE110 | 100 | 85.28 | <input checked="" type="checkbox"/> | | |
| Pentone Corporation | Citrikleen XPC | 100 | 99.09 | <input checked="" type="checkbox"/> | | |

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|-----------------------|---------------|----|-------|-------------------------------------|--|
| Buckeye International | Shopmaster FF | 10 | 98.35 | <input checked="" type="checkbox"/> | |
| Today & Beyond | Beyond 2006 | 10 | 98.20 | <input checked="" type="checkbox"/> | |

Conclusion:

It appears that Solsafe 245, Citriburst 7, Citrikleen XPC, Shopmaster FF and Beyond 2006 are all capable of removing the dried coating from the ceramic coupons through agitation and manual wiping.