# CLEANING LABORATORY EVALUATION SUMMARY

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|---|---|
| SCL #: | 2008 |
| DateRun: | 03/27/2008 |
| Experimenters: | Jason Marshall, Shweta Bansal |
| ClientType: | Machining Company |
| ProjectNumber: | Project #1 |
| Substrates: | Aluminum |
| PartType: | Coupon |
| Contaminants: | Inks |
| Cleaning Methods: | Manual Wipe |
| Analytical Methods: | Gravimetric |
| Purpose: | To evaluate top products on second supplied ink using manual wiping. |
| Experimental Procedure: | The twelve successful products from the previous trial were used at full strength and room temperature. Twenty-four preweighed coupons were coated with the supplied Markal Valve Action Paint Marker (orange ink). Once dry, a second weight was recorded to determine the amount of ink added to the coupon. In contrast to the previous trial, two coupons were used per cleaning alternative. A handheld swab was immersed into the cleaning product and then manual wiped across the coupon for up to one minute. Following the cleaning, the coupons was wiped dry for 5 seconds. Observations were made, final coupon weights recorded, and the average efficiencies were calculated. |
| Results: | All but one product was successful in removing the orange ink from the aluminum coupons using manual cleaning. It was noted that some of soy-based products needed a second wiping to remove the excess cleaning product left behind. The successful products all required less than one minute to remove the ink. The table below lists the amount of ink applied, the amount remaining, the efficiency and the time needed to clean the ink. |

| Cleaner | Initial wt | Final wt | % Removed | Time Required (sec) |
|---|---|---|---|---|
| Soy Clear 1500 | 0.0084 | 0.0014 | 83.33 | 15 |
| | 0.0128 | 0.0030 | 76.56 | |
| Ink Zapper | 0.0153 | 0.0022 | 85.62 | 35 |
| | 0.0125 | 0.0034 | 72.80 | |
| Methyl Ester 1618 | 0.0191 | 0.0026 | 86.39 | 20 |
| | 0.0108 | 0.0017 | 84.26 | |
| Citrus Soy Solvent Cleaner & Degreaser | 0.0094 | 0.0022 | 76.60 | 17-18 |
| | 0.0145 | 0.0040 | 72.41 | |
| Graffiti Remover SAC | 0.0197 | 0.0019 | 90.36 | 10 |
| | 0.0143 | 0.0016 | 88.81 | |
| Soy Strong | 0.0109 | 0.0015 | 86.24 | <10 |
| | 0.0123 | 0.0026 | 78.86 | |
| BioRenewables Industrial Degreaser | 0.0094 | 0.0012 | 87.23 | 7-8 |
| | 0.0113 | 0.0017 | 84.96 | |
| EP 921 | 0.0099 | 0.0007 | 92.93 | 8-9 |
| | 0.0116 | 0.0010 | 91.38 | |
| Inproclean 4000 T | 0.0169 | 0.0165 | 2.37 | >60 |
| | 0.0125 | 0.0168 | -34.40 | |
| BG Solv 717 Ink & Graffiti Cleaner | 0.0118 | 0.0006 | 94.92 | 6 |
| | 0.0091 | 0.0007 | 92.31 | |
| Graffiti remover | 0.0073 | 0.0010 | 86.30 | 9 |

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| | 0.0152 | 0.0008 | 94.74 | |
| Smart Solve 605 | 0.0197 | 0.0008 | 95.94 | 9 |
| | 0.0180 | 0.0013 | 92.78 | |

Summary:

| **Substrates:** | Aluminum |
|---|---|
| **Contaminants:** | Inks |

| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
|---|---|---|---|---|---|
| AG Environmental Products | Soy Clear 1500 | 100 | 79.95 | ☑ | |
| Vertec BioSolvents | Ink Zapper | 100 | 79.21 | ☑ | |
| Twin Rivers Technologies | Methyl Ester 1618 | 100 | 85.32 | ☑ | |
| Bi-O-Kleen Industries | Citrus Soy Solvent Cleaner & Degreaser | 100 | 74.50 | ☑ | |
| Spartan Chemical Company | Graffiti Remover SAC | 100 | 89.58 | ☑ | |
| Spartan Chemical Company | Soy Strong | 100 | 82.55 | ☑ | |
| Spartan Chemical Company | BioRenewables - Restroom Cleaner | 100 | 86.09 | ☑ | |
| Inland Technologies Inc | EP 921 | 100 | 92.15 | ☑ | |
| Oakite Products | Inproclean 4000 T | 100 | -16.02 | ☐ | |
| BioGenesis Enterprises Inc | BG Solv 717 Ink & Graffiti Cleaner | 100 | 93.61 | ☑ | |
| Finger Lakes Chemical | Graffiti remover | 100 | 90.52 | ☑ | |
| United Laboratories International | Smart Solve 605 | 100 | 94.36 | ☑ | |

Conclusion:

The successful products will be used on the next supplied ink following the same procedure. Two of the products from Spartan were determined to be the same (or very similar) products. Only one of the two will be kept in the study.