

CLEANING LABORATORY EVALUATION SUMMARY

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: Visual, Timing

Purpose: To evaluate selected products on fourth supplied ink using manual wiping.

Experimental Procedure: The top ten successful products from the previous trial were used at full strength and room temperature. Twenty preweighed coupons were coated with the supplied Sharpie permanent marker (blue). Once dry, a second weight was recorded to determine the amount of ink added to the coupon. As in the last 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: Due to the limited weight added by the blue sharpie, gravimetric analysis yielded inconclusive results and therefore, analysis was performed based on visual rankings and length of time needed to clean the coupons. Products were considered successful in they removed the ink in under one minute of cleaning. Six of the ten products required under one minute. The table lists the time needed to clean the ink from the coupons and the rankings for each coupon.

| Cleaner | Time (sec) | Visual Rank |
|--|------------|-------------|
| Soy Clear 1500 | >60 | 10 |
| Ink Zapper | 10 | 4 |
| Methyl Ester 1618 | >60 | 9 |
| Citrus Soy Solvent Cleaner & Degreaser | >60 | 8 |
| Graffiti Remover SAC | 12 | 6 |
| BioRenewables Industrial Degreaser | >60 | 7 |
| EP 921 | 10 | 3 |
| BG Solv 717 Ink & Graffiti Cleaner | 7 | 1 |
| Graffiti remover | 7 | 2 |
| Smart Solve 605 | 25 | 5 |

Summary:

| Substrates: | Aluminum | | | | |
|----------------------------|--|--------|-------------|-------------------------------------|---------------|
| Contaminants: | Inks | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| AG Environmental Products | Soy Clear 1500 | 100 | 0.00 | <input type="checkbox"/> | |
| Vertec BioSolvents | Ink Zapper | 100 | 0.00 | <input checked="" type="checkbox"/> | |
| Twin Rivers Technologies | Methyl Ester 1618 | 100 | 0.00 | <input type="checkbox"/> | |
| Bi-O-Kleen Industries | Citrus Soy Solvent Cleaner & Degreaser | 100 | 0.00 | <input type="checkbox"/> | |
| Spartan Chemical Company | Graffiti Remover SAC | 100 | 0.00 | <input checked="" type="checkbox"/> | |
| Spartan Chemical Company | BioRenewables - Restroom Cleaner | 100 | 0.00 | <input type="checkbox"/> | |
| Inland Technologies Inc | EP 921 | 100 | 0.00 | <input checked="" type="checkbox"/> | |
| BioGenesis Enterprises Inc | BG Solv 717 Ink & Graffiti Cleaner | 100 | 0.00 | <input checked="" type="checkbox"/> | |

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|-----------------------------------|------------------|-----|------|-------------------------------------|--|
| Finger Lakes Chemical | Graffiti remover | 100 | 0.00 | <input checked="" type="checkbox"/> | |
| United Laboratories International | Smart Solve 605 | 100 | 0.00 | <input checked="" type="checkbox"/> | |

Conclusion:

The same set of products will be evaluated on the fifth supplied ink despite the limited success on the Sharpie marker.