

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1997
 DateRun: 07/09/1997
 Experimenters: Jason Marshall, Prashant Trivedi
 ClientType: Machine Construction Company
 ProjectNumber: Project #1
 Substrates: Stainless Steel
 PartType: Coupon
 Contaminants: Inks
 Cleaning Methods: Manual Wipe
 Analytical Methods: Gravimetric, Timing
 Purpose: Practical application of two terpene cleaners.

Experimental Procedure: Four coupons were contaminated with a single pass of ink and allowed to dry as in the previous two trials (7/8 -7/9). The main purpose of this trial was to determine a practical application usage of the two terpene cleaners. The customer supplied cleaner was compared to the terpene cleaners to determine the time needed to clean the ink from the substrate. The cleaners were applied to a paper towel as in the previous trials. When the cleaning started the clock was started. When the ink was completely removed from the coupon, the clock was stopped and the time was recorded. The coupons were then left for a period of three hours and weighed to determine the amount of ink left behind.
 SUBSTRATE MATERIAL: Stainless Steel
 CONTAMINANTS: Ink--Steel Blue DX-100 solvent based dye
 CONTAMINATING PROCESS USED: Single pass with ink on coupon, dried as before

Results:

| coupon # | Coupon weight | contaminated coupon wt | contaminate weight | cleaned coupon wt | remaining contaminater | % cont. remaining | removal time | comments |
|------------|---------------|----------------------------|--------------------|-------------------|------------------------|-------------------|--------------|----------|
| 13 | 63.2196 | 63.2241 | 0.0045 | 63.2179 | -0.0017 | -37.78 | 16sec | damage |
| 14 | 63.224 | 63.2273 | 0.0033 | 63.2206 | -0.0034 | -103.03 | 8sec | damage |
| 15 | 63.1253 | 63.1304 | 0.0051 | 63.1289 | 0.0036 | 70.59 | 13sec | |
| 16 | 62.9896 | 62.9944 | 0.0048 | 62.9878 | -0.0018 | -37.50 | 6sec | damage |
| cleaner ID | | | | | | | | |
| 13 | | Safety Layout Blue Remover | | | | | | |
| 14 | | Terpene Technology HTF-50 | | | | | | |
| 15 | | Terpene Technology HTF-60 | | | | | | |
| 16 | | T Square HTF-50 | | | | | | |

All of the cleaners appeared to remove the ink in under twenty seconds. According to the data, cleaner number 15 only removed about 30% of the cleaner. Yet upon visual inspection, there seemed to be no ink on the coupon. The other three cleaners damaged the coupons only slightly. This could be do to the before mentioned reason in trial 2 (accuracy of balance). Despite the minimal damage to the substrate, the cleaners worked well in the practical application of the ink to the coupons.

Summary:

| | | | | | | |
|--------------------------------|--|----------------------------|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | | Stainless Steel | | | | |
| Contaminants: | | Inks | | | | |
| Company Name: | | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Accurate Manufactured Products | | Safety Layout Blue Remover | 100 | | <input checked="" type="checkbox"/> | |
| Tarksol Inc | | Tarksol HTF-50 | 100 | | <input checked="" type="checkbox"/> | |
| Tarksol Inc | | Tarksol HTF 60 | 100 | | <input type="checkbox"/> | |

Conclusion:

Upon completion of the three trials relating to the ink removal from the substrate, the lab suggests trying the two terpene cleaners in house and small samples of each chemistry were shipped to client, along with the MSDS's. The client can determine which cleaner the prefer or try other terpene based products specifically designed for ink removal. It should be noted that the terpenes do have an odor that needs to be considered.