

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1995
 DateRun: 12/27/1995
 Experimenters: Jay Jankauskas
 ClientType: Adhesive Manufacturer
 ProjectNumber: Project #1
 Substrates: Stainless Steel
 PartType: Coupon
 Contaminants: Adhesive
 Cleaning Methods: Manual Wipe
 Analytical Methods: Visual
 Purpose: Mixtures of best terpenes & aqueous cleaners

Experimental Procedure: The purpose of this experiment is to find a cleaner for Adhesive Manufacturer that will replace their current 4:1 heptane-toluene mixture. As of today, no aqueous or terpene chemistries have been effective. The alkene hydrocarbons from CSA (Bio-Safe 1023 & 1024) are the best performing chemistries to date. Today's test will be to try mixtures of the best terpenes and aqueous cleaners. A combination of the dissolving effects and the lifting effects of each of these cleaners might be good. The best solvents tested to date were Solvent Kleene D-Greeze 500, Oakite Inproclean 4000 T and the CSA chemicals. The best aqueous chemistries tested to-date are the AW Chesterton 803 Marine Solvent, MacDermid ND-17 and Brulin Compliance. Each chemistry was mixed up at a 50:50 ratio, one aqueous cleaner with a terpene solvent. Duro-Tac adhesive was allowed to sit on the coupons for 10 to 15 minutes. Cleaning solution was allowed to set on the contaminated coupons for thirty seconds.
SUBSTRATE MATERIAL: 316 Stainless Steel Coupons
CONTAMINANTS: Duro-Tac toluene-heptane based adhesive
CONTAMINATING PROCESS USED: Adhesives applied on with swab and allowed to sit for 10 minutes to 15 minutes

| Results: | Mixture | Time of Removal |
|----------|-------------------------|-----------------|
| | AW Chest & D-greeze 500 | 35 seconds |
| | AW Chest & Oakite 4000T | 65 seconds |
| | AW Chest & CSA 1023 | 50 seconds |
| | ND 17 & D-greeze 500 | 35 seconds |
| | ND 17 & 4000-T | 50 seconds |
| | ND 17 & CSA 1023 | 50 seconds |
| | Brulin & D-greeze 500 | 55 seconds |
| | Brulin & Oakite 4000T | 65 seconds |
| | Brulin & CSA 1023 | 55 seconds |

| | | | | | | |
|----------|-------------------------------|------------------------------------|-----------------|--------------------|-------------------------------------|----------------------------|
| Summary: | Substrates: | | Stainless Steel | | | |
| | Contaminants: | | Adhesive | | | |
| | Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| | AW Chesterton | 803 Industrial & Marine Solvent II | 50 | | <input checked="" type="checkbox"/> | mix with D Greeze 500 |
| | AW Chesterton | 803 Industrial & Marine Solvent II | 50 | | <input type="checkbox"/> | mix with Inproclean 4000 T |
| | AW Chesterton | 803 Industrial & Marine Solvent II | 50 | | <input type="checkbox"/> | mix with Bio Safe 1023 |
| | MacDermid Industrial Products | ND 17 | 50 | | <input checked="" type="checkbox"/> | mix with D Greeze 500 |
| | MacDermid Industrial Products | ND 17 | 50 | | <input type="checkbox"/> | mix with Inproclean 4000 T |
| | MacDermid Industrial Products | ND 17 | 50 | | <input type="checkbox"/> | mix with Bio Safe 1023 |
| | Brulin Corporation | Compliance | 50 | | <input type="checkbox"/> | mix with D Greeze 500 |
| | Brulin Corporation | Compliance | 50 | | <input type="checkbox"/> | mix with Inproclean 4000 T |
| | Brulin Corporation | Compliance | 50 | | <input type="checkbox"/> | mix with Bio Safe 1023 |

Conclusion:

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Either a mixture of AW Chesterton & D-Greeze 500 or the ND 17 & D-Greeze 500. One final test will be performed on larger stainless steel parts to find appropriate sit times of the cleaning chemistries.