

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1995  
 DateRun: 10/24/1995  
 Experimenters: Donald Garlotta, Jay Jankauskas  
 ClientType: Adhesive Manufacturer  
 ProjectNumber: Project #1  
 Substrates: Steel  
 PartType: Coupon  
 Contaminants: Adhesive  
 Cleaning Methods: Manual Wipe  
 Analytical Methods: Wipe  
 Purpose: Replace current 4:1 heptane-toluene mixture

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. Ten different cleaners were selected on the basis of manufacturer's claims that they were effective in removing adhesives. These cleaners were:

- 5% solution of International Products, Inc. Micro
- 10% Calgon Corporation Geoguard 5210
- 20% Chem-Tech International Inc. CT-1 multipurpose cleaner
- 20% Terpene Technologies HTF 50
- 20% MacDermid Inc. ND-17
- 33% Oakite Products, Inc. Citridet
- 10% Pride International Citrisolv Plus
- 33% WR Grace Daraclean 294xx
- 20% Cleaning Systems Inc. Release
- 33% Oakite Products Inproclean 4000T

Durotac Adhesive was applied to the 1040 Cold Rolled steel coupons. Sitting times of the adhesives was between one hour and two hours. Cleaning would be accomplished by first applying some cleaner onto the contaminated coupons and allowing to sit for about ten seconds. A SOS pad was then used to scrub off the adhesive. The maximum time allotted for cleaning was two minutes and thirty seconds, if less time was needed to obtain 100% removal then cleaning time was noted. A coupon was cleaned for each cleaner made up at both room temperature and at 120 F. Each cleaned coupon was compared to a coupon cleaned with 100% toluene (we were unable to obtain heptane). The time required to clean the coupon with toluene was thirty seconds.

Results:

| Cleaner                      | Time (min) | cleanliness | Temp | Time | cleanliness |
|------------------------------|------------|-------------|------|------|-------------|
| 10% Calgon Geo-Guard 5210    | 2.5        | 8           | 130  | 2.30 | 5           |
| 20% ChemTech CT-1            | 2.5        | 3           | 122  | 2.30 | 9           |
| 20% Terpene Tech. HTF 50     | 1.5        | 1           | 122  | 1.30 | 1           |
| 20% MacDermid ND-17          | 2.5        | 4           | 132  | 2.30 | 4           |
| 33% Oakite Citridet          | 2.5        | 2           | 129  | 2.00 | 6           |
| 10% Pride Citrisolv Plus     | 2.5        | 6           | 132  | 1.40 | 7           |
| 5% IPC Micro                 | 2.5        | 10          | 126  | 2.30 | 10          |
| 33% WR Grace Daraclean 294xx | 2.5        | 9           | 116  | 1.35 | 2           |
| 20% CSI Release              | 2.5        | 7           | 131  | 2.10 | 3           |
| 33% Oakite 4000T             | 2.5        | 5           | 130  | 2.30 | 6           |

\*cleanliness is compared for runs at the same temperature with 1 being the best and 10 the worst.

Summary:

|                                    |                             |               |                    |                          |                      |
|------------------------------------|-----------------------------|---------------|--------------------|--------------------------|----------------------|
| <b>Substrates:</b>                 | Steel                       |               |                    |                          |                      |
| <b>Contaminants:</b>               | Adhesive                    |               |                    |                          |                      |
| <b>Company Name:</b>               | <b>Product Name:</b>        | <b>Conc.:</b> | <b>Efficiency:</b> | <b>Effective:</b>        | <b>Observations:</b> |
| International Products Corporation | Micro (no longer available) | 5             |                    | <input type="checkbox"/> |                      |

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|                               |                           |    |  |                          |  |
|-------------------------------|---------------------------|----|--|--------------------------|--|
| Calgon Corporation            | Geo Guard 5210            | 10 |  | <input type="checkbox"/> |  |
| Chemkleen International Inc.  | CT 1 Multipurpose Cleaner | 20 |  | <input type="checkbox"/> |  |
| Tarksol Inc                   | Tarksol HTF-50            | 20 |  | <input type="checkbox"/> |  |
| MacDermid Industrial Products | ND 17                     | 20 |  | <input type="checkbox"/> |  |
| Oakite Products               | Citradet                  | 33 |  | <input type="checkbox"/> |  |
| Pride International Inc       | Citrisolv Plus            | 10 |  | <input type="checkbox"/> |  |
| Magnaflux                     | Daraclean 294 xx          | 33 |  | <input type="checkbox"/> |  |
| Oakite Products               | Inproclean 4000 T         | 33 |  | <input type="checkbox"/> |  |

**Conclusion:**

No cleaners were found to achieve a cleaning time even close to that of the pure toluene. Although the increased temperature did aid in the removal of the adhesives, the fastest cleaning time was only 1 minute and 30 seconds. Additional sourcing out of adhesive removers will have to be done. Also, might try using the cleaner solutions at 100% concentrate.