

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2005  
DateRun: 10/26/2005  
Experimenters: Jason Marshall  
ClientType: Machinery Manufacturer  
ProjectNumber: Project #1  
Substrates: Aluminum  
PartType: Coupon  
Contaminants: Oil  
Cleaning Methods: Manual Wipe  
Analytical Methods:

Purpose: To generate a list of alternatives to heptane for removing oil from aluminum parts.

Experimental Procedure: Using the laboratory's database for solvent cleaning substitution, the lab generated a lists of products that have been used to clean oil from aluminum parts using manual wiping. In addition, vendor supplied data was also searched to generate additional products.

Results: The first table lists the products that have been tested at SSL for oil removal from aluminum parts using manual wiping. The second table are products that have been tested for oil removal from aluminum parts using various methods (immersion, ultrasonics).

Products Matching All Search Criteria

Contaminant: Oil

Substrate: Aluminum

Equipment: Manual wipe

| CompanyName            | ProductName         |
|------------------------|---------------------|
| Bo Chem Company        | T 110               |
| Gemtek Products        | SC 1000             |
| Hotsy Cleaning Systems | Tubmate All Purpose |

Products Tested at SSL for contaminant and substrate

Contaminant: Oil

Substrate: Aluminum

| CompanyName                                | ProductName           |
|--|-----------------------|
| 3M   | HFE 71 De             |
| 3M   | HFE 7100              |
| 3M   | HFE 7200              |
| Abatement Technology                       | Bio Might 100         |
| AGA Chemical                               | AK 225                |
| Alconox Inc                                | Citranox              |
| Alconox Inc                                | Detergent 8           |
| Alconox Inc                                | Det-O-Jet             |
| Armex Cleaning and Coating Removal Systems | Sodium Bicarbonate    |
| AW Chesterton                              | KPC 820 N             |
| BCS Company                                | Ultra Blue 100        |
| Bio Chem Systems                           | Bio T 200 A           |
| Bio Chem Systems                           | Bio T 300 B           |
| Bio Chem Systems                           | Bio T Max             |
| Bio Chem Systems                           | Bio T Parts Washer NR |
| Bio Chem Systems                           | Bio T V 50            |
| Bio Chem Systems                           | Green Stuff (6325)    |
| Bo Chem Company                            | T 110                 |
| Brulin Corporation                         | Aquavantage 1400      |
| Brulin Corporation                         | Brulin 63 G           |
| Brulin Corporation                         | Formula 815 GD        |
| CAE Cleaning Technologies                  | Evercycle UCI         |

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|                               |                                  |
|-------------------------------|----------------------------------|
| Calgon Corporation            | AK 6215                          |
| Calgon Corporation            | Geo Guard 2215                   |
| Calgon Corporation            | RT 806                           |
| Chem Free Corporation         | Ozzy Juice SW 1                  |
| Chem Free Corporation         | Ozzy Juice SW 3                  |
| Chemical Technologies         | Green Thunder                    |
| Chemstation International     | Green Stuff Neutral              |
| Cleansafe Solutions           | Solution 2000                    |
| Dow Chemical Company          | OS 10                            |
| Dow Chemical Company          | OS 20                            |
| Dow Chemical Company          | OS 30                            |
| Drummond America Corporation  | Clout                            |
| Drummond America Corporation  | Keynote                          |
| DuPont                        | Vertrel CCA                      |
| DuPont                        | Vertrel MCA                      |
| Ecolink                       | Heavy Weight Non Butyl Detergent |
| Ecolink                       | Positron                         |
| Ecolink                       | Universal Steam Cleaner          |
| Ecolink                       | Vortex                           |
| Emkay Chemical Company        | Safety Wash Clear                |
| Emkay Chemical Company        | Safety Wash CRC                  |
| Ensolve Biosystems Inc        | Grease Feast Plus                |
| Enviro Tech International Inc | Ensolv                           |
| Enviro Tech International Inc | Ensolv A                         |
| Environmental Services        | TASC                             |
| Environmental Technology      | RB Degreaser Cleaner             |
| Finger Lakes Chemical         | Resineater                       |
| Finish Line Technologies Inc  | Bio Degradable Degreaser         |
| Gemtek Products               | SC 1000                          |
| Gemtek Products               | SC Aircraft & Metal Cleaner      |
| Gemtek Products               | SC Supersolve                    |
| General Chemical Corporation  | Aluminex 5834                    |
| General Chemical Corporation  | Aquaclean 4784                   |
| Heatbath Corporation          | Alu-Kleen 36                     |
| Heatbath Corporation          | Multi-Kleen 1568                 |
| Heatbath Corporation          | Power Wash Cleaner BCR           |
| Heatbath Corporation          | Uni Kleen 10                     |
| Hotsy Cleaning Systems        | Tubmate All Purpose              |
| Hubbard Hall Inc              | Aquasonic 201                    |
| Hubbard Hall Inc              | Ram Charger                      |
| Hurri Kleen Corportion        | Hot Immersion Degreaser          |
| Hurri Kleen Corportion        | Parts Washer Degreaser           |

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|                                    |  |
|------------------------------------|--|
| Hurri Kleen Corportion             | Special Degreaser                        |
| Inland Technologies Inc            | Citrasafe                                |
| Innovative Organics Inc            | Amber Clean SC 11                        |
| Innovative Organics Inc            | Amberclean L 12                          |
| Innovative Organics Inc            | Amberclean Q3                            |
| International Products Corporation | Micro 90                                 |
| International Products Corporation | Surface Cleanse 930                      |
| ITW Fluid Products Group           | AccuClean                                |
| JDI Inc                            | Mirachem 500 RTU                         |
| Kleer Flo Company                  | Grease Off 2                             |
| Kyzen Corporation                  | Ionox FCR                                |
| Kyzen Corporation                  | Ionox HC 2                               |
| Kyzen Corporation                  | Metalnox M6314                           |
| Kyzen Corporation                  | Metalnox M6960                           |
| MacDermid Industrial Products      | ND LF Supreme                            |
| Magnaflux                          | Daraclean 200                            |
| Magnaflux                          | Daraclean 212                            |
| Magnaflux                          | Daraclean 235                            |
| Magnaflux                          | Daraclean 282                            |
| Magnaflux                          | Daraclean 282 GF                         |
| Magnaflux                          | Daraclean 283                            |
| Magnum Research Corporation        | Aluminum Aerowash                        |
| Man Gill Chemical Company          | Gillite 0650 Cl                          |
| Man Gill Chemical Company          | Gillite 1156                             |
| Man Gill Chemical Company          | Gillite 160 X                            |
| Matchless Metal Polish Company     | MC 132                                   |
| Matchless Metal Polish Company     | MC 580                                   |
| Micro Care                         | Flux Remover C                           |
| Micro Care                         | Heavy Duty Degreaser C                   |
| Mirachem Corporation               | Mirachem 500                             |
| New Pig Corporation                | Hoofmark All Purpose Cleaner & Degreaser |
| New Pig Corporation                | Hoofmark Industrial Cleaner              |
| New Pig Corporation                | New Pig Degreaser                        |
| North Atlantic Bio Industries      | NAB 9000                                 |
| Oakite Products                    | Citradet                                 |
| Oakite Products                    | Inproclean 2000                          |
| Oakite Products                    | Inproclean 2500                          |
| Oakite Products                    | Inproclean 3800                          |
| Oakite Products                    | Oakite 77                                |
| Oakite Products                    | Oakite Low Heat Cleaner 1                |
| Oakite Products                    | Okemclean                                |
| Occidental Chemical Corporation    | OX SOL 100                               |
| PCI of America                     | Hurrisafe 9450                           |
| Permatex Industrial Corporation    | Natural Blue                             |
| Poly Systems USA Inc               | Solvon IP                                |

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|                                      |                                   |
|--------------------------------------|-----------------------------------|
| Poly Systems USA Inc                 | Solvon PB                         |
| Safe CleanUp Solutions               | Super Neutral                     |
| Savogran Company                     | Dirtex Prepaint Cleaner           |
| Simple Green                         | All Purpose Cleaner/<br>Degreaser |
| Smart Sonic Corp                     | 440 R SMT Detergent               |
| Solvent Kleene Inc                   | D Greeze 1000                     |
| Solvent Kleene Inc                   | D-Greeze GL 55                    |
| SWR Corporation                      | SWR One                           |
| Texo Corporation                     | Texolite 1734 XL                  |
| Today & Beyond                       | Beyond 2001                       |
| Today & Beyond                       | Beyond 2002                       |
| Today & Beyond                       | Beyond 2003                       |
| Today & Beyond                       | Beyond 2004                       |
| Today & Beyond                       | Beyond 2005                       |
| Today & Beyond                       | Beyond 2009                       |
| Tower Products Inc                   | Tower 270 Cleaner<br>Concentrate  |
| Turco Products Inc                   | Turco 5948 DPM                    |
| United Laboratories<br>International | United 450 All Clear              |
| US Polychem<br>Corporation           | 87 RB                             |
| US Polychem<br>Corporation           | Hydropurge HPL 790                |
| US Polychem<br>Corporation           | Polychem A 2000 XS                |
| US Polychem<br>Corporation           | Polyspray Jet 790 C               |
| Valtech Corporation                  | Valtron SP 2250 2LF               |
| Valtech Corporation                  | Valtron SP 2275                   |
| Warren Chemical<br>Company           | Sea Wash 700 New                  |
| Warren Chemical<br>Company           | Sea Wash 700 Old                  |
| Warren Chemical<br>Company           | Sea Wash 8 New                    |
| Warren Chemical<br>Company           | Sea Wash 8 No Force               |
| Warren Chemical<br>Company           | Sea Wash Neutral                  |
| Water                                | DI Water                          |
| Watson Technical<br>Associates       | Formula 7100                      |
| Watson Technical<br>Associates       | Watson Formula 7000               |
| Watson Technical<br>Associates       | Watson Formula<br>7001-CP         |
| Watson Technical<br>Associates       | Watson Formula 7300               |
| Watson Technical<br>Associates       | Watson Formula 9000               |
| Westford Chemical<br>Corporation     | Biosolve                          |

Summary:

Conclusion:

There are a wide range of products that could be used for the specified oil removal from aluminum parts using manual wiping. The following table contains a list of products selected for the previous tables. The have been used for a wide range of application at SSL.

| Company Name       | Product Name   |
|--------------------|----------------|
| Brulin Corporation | Formula 815 GD |

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|                         |                               |
|-------------------------|-------------------------------|
| Warren Chemical Company | Sea Wash 8 No Force           |
| Oakite Products         | Inproclean 3800               |
| Magnaflux               | Daraclean 282 GF              |
| Gemtek Products         | SC Aircraft & Metal Cleaner   |
| Heatbath Corporation    | Uni Kleen 10                  |
| Church & Dwight Co Inc  | Armakleen M Auto              |
| Solvent Kleene Inc      | D Greeze 500 LO               |
| Bio Chem Systems        | Bio T V 50                    |
| 1st Envirosafety        | Organic Cleaner/<br>Degreaser |
| Buckeye International   | Shopmaster                    |
| US Polychem Corporation | Polyspray Jet 790 XS          |

Cleaning varies from case to case. The SSL recommends process specific testing on potential replacement cleaning chemicals. If more information is needed on a particular product, or you are interested in conducting cleaning trials, please contact the lab at (978)934-3133.