

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2003

DateRun: 10/30/2003

Experimenters: Jason Marshall

ClientType: TUR Agency

ProjectNumber: Project #1

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Oil

Cleaning Methods:

Analytical Methods:

Purpose: To generate a list of alternative for mineral oil removal from stainless steel

Experimental Procedure: Using the laboratory's database for solvent cleaning substitution, the lab generated the following lists of products. The products have been evaluated at SSL under similar conditions to the client's criteria.

Results: The following products have been used successfully for mineral oil removal for various substrates:

| Total | CompanyName               | ProductName                 |
|-------|---------------------------|-----------------------------|
| 3     | Brulin Corporation        | Formula 815 GD              |
| 3     | Innovative Organics Inc   | Amberclean 527 L            |
| 3     | Today & Beyond            | Beyond 2004                 |
| 3     | Valtech Corporation       | Valtron SP 2275             |
| 2     | CAE Cleaning Technologies | Evercycle 2000              |
| 2     | Texo Corporation          | Texo Cleaner 127            |
| 1     | Bio Chem Systems          | Solsafe 245                 |
| 1     | Bio Chem Systems          | Green Stuff (6325)          |
| 1     | Buckeye International     | Shopmaster LPH              |
| 1     | Gemtek Products           | SC Aircraft & Metal Cleaner |

In addition, several products have been successful in various oil removal from stainless steel coupons. Over 100 products have been tested. The top 22 products are listed below.

| Total | Company Name             | Product Name                     |
|-------|--------------------------|----------------------------------|
| 8     | Emkay Chemical Company   | Safety Wash Clear                |
| 8     | Innovative Organics Inc  | Amberclean L 12                  |
| 7     | ITW Fluid Products Group | AccuClean                        |
| 6     | Brulin Corporation       | Formula 815 GD                   |
| 6     | Chemical Technologies    | Green Thunder                    |
| 5     | Drummond American        | Keynote                          |
| 5     | Heatbath Corporation     | Power Wash Cleaner BCR           |
| 5     | Magnaflux                | Daraclean 282                    |
| 5     | Magnaflux                | Daraclean 282 GF                 |
| 5     | Mirachem Corporation     | Mirachem 500                     |
| 5     | Oakite Products          | Oakite 77                        |
| 5     | Valtech Corporation      | Valtron SP 2250 2LF              |
| 4     | Drummond American        | Clout                            |
| 4     | Ecolink                  | Heavy Weight Non Butyl Detergent |

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|   |                                    |   |
|---|------------------------------------|---|
| 4 | Ensolve Biosystems Inc             | Grease Feast Plus                           |
| 4 | New Pig Corporation                | New Pig Degreaser                           |
| 4 | Safe Science                       | Safe Science Concrete/Graffiti (Industrial) |
| 4 | United Laboratories                | United 450 All Clear                        |
| 4 | US Polychem Corporation            | Polyspray Jet 790 P                         |
| 4 | Warren Chemical Company            | Sea Wash 700                                |
| 4 | Warren Chemical Company            | Sea Wash Neutral                            |
| 4 | Westford Chemical Corporation      | Biosolve                                    |
| 3 | Alconox Inc                        | Citranox                                    |
| 3 | AW Chesterton                      | KPC 820 N                                   |
| 3 | Bio Chem Systems                   | Bio T V 50                                  |
| 3 | Branson                            | GP  |
| 3 | Calgon Corporation                 | AK 6215                                     |
| 3 | Chem Free Corporation              | Ozzy Juice SW 3                             |
| 3 | Heatbath Corporation               | Alu-Kleen 36                                |
| 3 | Hubbard Hall Inc                   | Aquasonic 201                               |
| 3 | Magnaflux                          | Daraclean 212                               |
| 3 | Matchless Metal Polish Company     | MC 580                                      |
| 3 | North Atlantic Bio Industries      | NAB 9000                                    |
| 3 | Oakite Products                    | Inproclean 3800                             |
| 3 | Today & Beyond                     | Beyond 2005                                 |
| 3 | Today & Beyond                     | Beyond 2009                                 |
| 3 | Twin Rivers Corp                   | Methyl Ester 1618                           |
| 3 | Water                              | Water                                       |
| 2 | Abatement Technology               | Bio Might 100                               |
| 2 | Alconox Inc                        | Det-O-Jet                                   |
| 2 | Bio Chem Systems                   | Green Stuff (6325)                          |
| 2 | Calgon Corporation                 | Geo Guard 2215                              |
| 2 | Chemstation                        | Green Stuff Neutral                         |
| 2 | Church & Dwight                    | Armakleen M Auto                            |
| 2 | Cleansafe Solutions                | Solution 2000                               |
| 2 | Diversey                           | Twist                                       |
| 2 | Ecolink                            | Safe Strip                                  |
| 2 | Ecolink                            | Vortex                                      |
| 2 | Fine Organic Corporation           | FO 2085 M                                   |
| 2 | Gemtek Products                    | SC Supersolve                               |
| 2 | Heatbath Corporation               | Uni Kleen 10                                |
| 2 | Hurri Kleen                        | Parts Washer Degreaser                      |
| 2 | International Products Corporation | Micro 90                                    |
| 2 | JDI Inc                            | Mirachem 500 RTU                            |
| 2 | MacDermid                          | ND 17                                       |
| 2 | Magnaflux                          | Daraclean 283                               |
| 2 | Man Gill Chemical                  | Gillite 0650 CI                             |
| 2 | Oakite Products                    | Citradet                                    |
| 2 | Oakite Products                    | Inproclean 2500                             |

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|   |                                |  |
|---|--------------------------------|--|
| 2 | Oakite Products                | Inproclean 4000 T                          |
| 2 | Savogran                       | Dirtex Prepaint Cleaner                    |
| 2 | Solvent Kleene Inc             | D Greeze 1000                              |
| 2 | Solvent Kleene Inc             | D Greeze 500 LO                            |
| 2 | Solvent Kleene Inc             | D-Greeze GL 55                             |
| 2 | Today & Beyond                 | Beyond 2001                                |
| 2 | Today & Beyond                 | Beyond 2002                                |
| 2 | Today & Beyond                 | Beyond 2003                                |
| 2 | Turco Products Inc             | Turco 5948 DPM                             |
| 2 | Warren Chemical Compnay        | Sea Wash 8 No Force                        |
| 2 | Watson Technical Associates    | Watson Formula 7300                        |
| 1 | Alconox Inc                    | Liquinox                                   |
| 1 | Baum's Castorine Company Inc   | EZE Oil-Grease Cleaner                     |
| 1 | Bio Chem Systems               | Bio T 200 A                                |
| 1 | Bio Chem Systems               | Bio T 300 B                                |
| 1 | Bio Chem Systems               | Bio T Parts Washer NR                      |
| 1 | Buckeye International          | Shopmaster                                 |
| 1 | Calgon Corporation             | RT 806                                     |
| 1 | Chem Free Corporation          | Ozzy Juice SW 1                            |
| 1 | Environmental Services         | TASC                                       |
| 1 | Equinox                        | Natural Solutions                          |
| 1 | Finger Lakes Chemicals         | 1-1-02                                     |
| 1 | Finger Lakes Chemicals         | Resineater                                 |
| 1 | Finish Line Technologies Inc   | Bio Degradable Degreaser                   |
| 1 | Gemtek Products                | SC Aircraft & Metal Cleaner                |
| 1 | General Chemical Corporation   | Aquaclean 4784                             |
| 1 | Heatbath Corporation           | Multi-Kleen 1568                           |
| 1 | Heatbath Corporation           | MultiKleen LX 1573                         |
| 1 | Hubbard Hall Inc               | Ram Charger                                |
| 1 | International Bio System       | Bio Z                                      |
| 1 | Kyzen Corporation              | Ionox FCR                                  |
| 1 | Kyzen Corporation              | Ionox HC 2                                 |
| 1 | MacDermid                      | ND LF Supreme                              |
| 1 | Man Gill Chemical              | Gillite 160 X                              |
| 1 | Master Chemical Corporation    | Trim Rinse 200                             |
| 1 | Matchless Metal Polish Company | MC 132                                     |
| 1 | Safe Science                   | Safe Science Engine Degreaser (Industrial) |
| 1 | Texo Corporation               | Texolite 1734 XL                           |
| 1 | Today & Beyond                 | Beyond 2004                                |
| 1 | Tower Products Inc             | Tower 270 Cleaner Concentrate              |
| 1 | US Polychem Corporation        | Polyspray Jet 790 C                        |

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|   |                             |                     |
|---|-----------------------------|---------------------|
| 1 | Valtech Corporation         | Valtron SP 2200     |
| 1 | Watson Technical Associates | Watson Formula 9000 |

Summary:

Conclusion: 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.