

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2009  
 DateRun: 03/12/2009  
 Experimenters: Johanna Oviedo  
 ClientType: Lab  
 ProjectNumber: Project #1  
 Substrates: Stainless Steel  
 PartType: Coupon  
 Contaminants: Resins/Rosins  
 Cleaning Methods: Immersion/Soak  
 Analytical Methods: Gravimetric

Purpose: To remove resin from stainless steel using immersion cleaning.

Experimental Procedure: Basic cleaning performance testing was conducted using ASTM G122 as the bases for cleaning. Products were selected based on the compatibility of substrate and for removal of the contaminant. Ten percent concentrations were used and heated the samples at 130F. The coupons were immersed in a product for 5 minutes, rinsed in tap water at 120 F and dried using compressed air at room temperature. Coupons were coated with the contaminant using a handheld swab and allowed to dry for 120 minutes at room temperature. The contaminated coupons were weighed again to determine the amount of soil added. After cleaning process, the final weights were recorded, efficiencies were calculated and recorded.

| Cleaner                    | Initial Wt. | Final Wt. | % Removed |
|----------------------------|-------------|-----------|-----------|
| Shopmaster                 | 0.3863      | 0.478     | -23.74    |
|                            | 0.3291      | 0.317     | 3.68      |
|                            | 0.1508      | 0.1678    | -11.27    |
| Citranox                   | 0.1035      | 0.1057    | -2.13     |
|                            | 0.0734      | 0.0725    | 1.23      |
|                            | 0.3246      | 0.2238    | 31.05     |
| Coil Bright                | 0.6307      | 0.4101    | 34.98     |
|                            | 0.6348      | 0.5705    | 10.13     |
|                            | 0.0632      | 0.0332    | 47.47     |
| Soy Strong                 | 0.0296      | 0.0326    | -10.14    |
|                            | 0.0423      | 0.0435    | -2.84     |
|                            | 0.0459      | 0.0451    | 1.74      |
| Inproclean 3800            | 0.0430      | 0.0320    | 25.58     |
|                            | 0.0285      | 0.0289    | -1.4      |
|                            | 0.0441      | 0.0387    | 12.24     |
| Graffiti Remover           | 0.0492      | 0.0536    | -8.94     |
|                            | 0.4053      | 0.2944    | 27.36     |
|                            | 0.1364      | 0.1273    | 6.67      |
| Metal Bright               | 0.0898      | 0.0765    | 14.81     |
|                            | 0.0692      | 0.0431    | 37.72     |
|                            | 0.2278      | 0.0446    | 80.42     |
| Phosphoric Acid Cleaner #1 | 0.0800      | 0.0841    | -5.12     |
|                            | 0.1087      | 0.1079    | 0.74      |
|                            | 0.2675      | 0.2524    | 5.64      |

Summary:

|                             |                      |               |                    |                          |                      |
|-----------------------------|----------------------|---------------|--------------------|--------------------------|----------------------|
| <b>Substrates:</b>          | Stainless Steel      |               |                    |                          |                      |
| <b>Contaminants:</b>        | Resins/Rosins        |               |                    |                          |                      |
| <b>Company Name:</b>        | <b>Product Name:</b> | <b>Conc.:</b> | <b>Efficiency:</b> | <b>Effective:</b>        | <b>Observations:</b> |
| Buckeye International       | Shopmaster           | 10            | -10.44             | <input type="checkbox"/> |                      |
| Alconox Inc                 | Citranox             | 10            | 10.05              | <input type="checkbox"/> |                      |
| Watson Technical Associates | Coil Bright          | 10            | 30.86              | <input type="checkbox"/> |                      |

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|                          |                            |    |       |                          |  |
|--------------------------|----------------------------|----|-------|--------------------------|--|
| Spartan Chemical Company | Soy Strong                 | 10 | -3.74 | <input type="checkbox"/> |  |
| Oakite Products          | Inproclean 3800            | 10 | 12.14 | <input type="checkbox"/> |  |
| Twin Rivers Technologies | Graffiti Remover           | 10 | 8.36  | <input type="checkbox"/> |  |
| Green Power              | Metal Bright               | 10 | 44.32 | <input type="checkbox"/> |  |
| Chemspec                 | Phosphoric Acid Cleaner #1 | 10 | 0.42  | <input type="checkbox"/> |  |

Conclusion: No product removed over 85% of the resin from stainless steel using immersion cleaning.