

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1996

DateRun: 05/08/1996

Experimenters: Jay Jankauskas

ClientType: Ceramic Coating Company

ProjectNumber: Project #1

Substrates: Steel, Teflon

PartType: Part

Contaminants: Coatings, Clay

Cleaning Methods: Mechanical Agitation

Analytical Methods: Visual

Purpose: Goal of trial is to find a cleaning method

Experimental Procedure: The goal of this trial is to find a viable method for Ceramic Coating Company to clean of their screens. Three different criteria were used to determine the effectiveness of a cleaning method:

- 1) Cleanliness- The new method must remove most of the baked-on clay/silicon dioxides from the screens.
- 2) Economically Viable- The new method must be cost effective and should also require as little equipment as possible and must not damage the screens.
- 3) Environmentally Friendly- The new method must not add to or create hazardous waste and/or worker exposure.

From the above listed criteria, two different methods were selected to be tested. The first method was to use an environmentally friendly cleaning chemical to remove the baked-on clay/silicon dioxide. Nine different chemicals were chosen on the basis of strength and classification. The sample screens obtained from Ceramic Coating Company were cleaned in a one-liter full-strength solution of each chemical. Cleaning was performed for 30 minutes at 120 F in a beaker agitated with a stir-bar. Cleaning effectiveness was observed by visual inspection. The second method to be tested was a sodium bicarbonate blasting process used at AA Environmental in Woburn, MA. The sodium bicarbonate blasting is similar to sandblasting except it is virtually nondestructive and the blasting material is water soluble and non-hazardous so it can be washed away. AA Environmental is basically a contract cleaning company who will come down to one's facility to perform the cleaning, but the sodium bicarbonate blasting equipment can also be purchased through them if so desired.

SUBSTRATE MATERIAL: Teflon coated steel screens
 CONTAMINANTS: Baked on Kaolin Clay/Silicon Dioxide
 CONTAMINATING PROCESS USED: As received from Ceramic Coating Company.

Results: The first part of the test proved to be unsuccessful. The only chemical that even touched the clay/silicon dioxide was the W.R. Grace 294xx. From the long contact time needed for a full-strength solution, this part of testing was deemed nonviable and was not explored any further. The sodium bicarbonate blasting proved to be very effective. All of the clay/silicon dioxide was removed from one half of a screen in less than a minute.

Summary:

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|--|--------------------------|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | Steel, Teflon | | | | |
| Contaminants: | Coatings, Clay | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| CSA Inc | Bio Safe 1023 | 100 | | <input type="checkbox"/> | |
| Eastern Color and Chemical Company | Ecobrite Cleaner AK | 100 | | <input type="checkbox"/> | |
| ISP Technologies | Ship Shape Resin Cleaner | 100 | | <input type="checkbox"/> | |
| US Polychem Corporation | Polychem PW 147 | 100 | | <input type="checkbox"/> | |
| US Polychem Corporation | Product 69 MC | 100 | | <input type="checkbox"/> | |
| Magnaflux | Daraclean 294 xx | 100 | | <input type="checkbox"/> | |
| Tarksol Inc | Tarksol HTF 321 | 100 | | <input type="checkbox"/> | |
| Brulin Corporation | Compliance | 100 | | <input type="checkbox"/> | |
| Cleaning Systems | Release | 100 | | <input type="checkbox"/> | |
| Armex Cleaning and Coating Removal Systems | Sodium Bicarbonate | 100 | | <input checked="" type="checkbox"/> | |

Conclusion:

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The one problem with the blasting was that the Teflon was also removed.