

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1999  
 DateRun: 09/30/1999  
 Experimenters: Jason Marshall, Cora Roelofs  
 ClientType: Metal Working  
 ProjectNumber: Project #1  
 Substrates: Steel  
 PartType: Part  
 Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Dirt, Oil  
 Cleaning Methods: Immersion/Soak  
 Analytical Methods: Visual, Wipe

Purpose: To further evaluate cleaning capabilities of the three previous cleaning solutions.

Experimental Procedure: Prior to cleaning the steel tubes were analyzed to determine the level of contamination. Each part was wiped with a finger and observations were recorded. Each cleaner was made into 10% solutions using DI water in 1400 mL beakers and heated to 120 F on a hot plate. One steel part and two stainless steel parts in each solution were cleaned in each beaker for five minutes using stir-bar-agitation. Three hollow tubes were cleaned in a 5-gallon immersion tank with and cleaned for five minutes using agitation. All parts were rinsed for 30 seconds in tap water at 120 F and dried using a Master Appliance Corp, Hot-air gun model HG-301A at 500 F for five minutes. After drying, wiping observations were made using a swab to determine how clean the parts were. The parts were also touched to determine if the surface still had any contamination.

SUBSTRATE MATERIAL: Steel parts  
 CONTAMINANTS: Oil and Dirt

Results: During the first cleaning of the stainless-steel part, it was determined that the inner hole was not being cleaned effectively when the open end was placed downward in the beaker. The position of the part was modified to evaluate cleaning in the upright and flat positions. It was found that the flat position was the most effective for removal of contaminants in the inner diameter. The results of cleaning are listed in Table 1.

Table 1. Cleaning Observations

| Part                 | Initial Observation | US Polychem                               | Calgon                            | Oakite                    |
|----------------------|---------------------|---|-----------------------------------|---------------------------|
| Steel Part           | Gritty feel         | felt and looked clean                     | felt and looked clean             | felt and looked clean     |
| Stainless Steel Part | Slick oil feel      | some dirt in inner tube                   | most dirt remaining of 3 cleaners | comparable to US Polychem |
| Hollow Tube          | Lot of black dirt   | mostly clean- little black dirt remaining | Not Tested                        | Not Tested                |

Summary:

| <b>Substrates:</b>      |                     | Steel   |             |                                     |               |
|-------------------------|---------------------|---|-------------|-------------------------------------|---------------|
| <b>Contaminants:</b>    |                     | Cutting/Tapping Fluids, Lubricating/Lapping Oils, Dirt, Oil |             |                                     |               |
| Company Name:           | Product Name:       | Conc.:  | Efficiency: | Effective:                          | Observations: |
| Calgon Corporation      | Geo Guard 2215      | 10  |             | <input type="checkbox"/>            |               |
| US Polychem Corporation | Polyspray Jet 790 P | 10  |             | <input checked="" type="checkbox"/> |               |
| Oakite Products         | Inproclean 3800     | 10  |             | <input checked="" type="checkbox"/> |               |

Conclusion: Of the three cleaners evaluated, US Polychem and the Oakite products yielded comparable cleaning capabilities for two of the three parts. The hollow tubes were adequately cleaned in the US Polychem.