

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1999  
 DateRun: 04/21/1999  
 Experimenters: Jason Marshall  
 ClientType: Electron & Ion Technology Co  
 ProjectNumber: Project #1  
 Substrates: Alloys, Stainless Steel, Titanium  
 PartType: Part  
 Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil  
 Cleaning Methods: Ultrasonics  
 Analytical Methods: OSEE

Purpose: To clean client supplied parts using the three cleaners from previous testing.

Experimental Procedure: The three cleaners were diluted to 5% by volume using DI water in 600 mL beakers. These solutions were then heated to 130 F on a hot plate and then immersed into a Crest 40 kHz ultrasonic tank model 4Ht 1014-6 at the filled with water heated to 130 F. OSEE readings were recorded prior to contamination with the metal working fluid. The parts were coated with the contaminant and readings were taken again. The parts were cleaned for three minutes, then rinsed for 30 seconds in a tap water bath at 120 F. Drying was performed using Master Appliance Corp, Hot-air gun model HG-301A at 500 F for one minute. Final OSEE readings were made.  
 SUBSTRATE MATERIAL: Client Supplied parts  
 CONTAMINANTS: Metal working fluid (Hangsterfer's S-500CF\_US)

Results: From the readings made, it was determined that the OSEE readings decreased as contaminant was added to the parts. The Branson and Warren Chemical products cleaned the parts beyond the initial level of clean recorded. The Matchless product resulted in a part that was cleaned back to its original condition. The water cleaned part was not cleaned to its original condition. Table 1 lists the average OSEE readings for the three stages.

Table 1. OSEE Readings

| Cleaner         | Preclean | Dirty  | Clean  |
|-----------------|----------|--------|--------|
| Branson         | 167.5    | 159    | 188.83 |
| Warren Chemical | 179.67   | 170.5  | 186    |
| Matchless       | 175.5    | 167    | 175.33 |
| Water           | 175.33   | 171.33 | 173.83 |

Summary:

| <b>Substrates:</b>             |  | Alloys, Stainless Steel, Titanium                     |        |             |                                     |               |
|--------------------------------|--|---|--------|-------------|-------------------------------------|---------------|
| <b>Contaminants:</b>           |  | Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil |        |             |                                     |               |
| Company Name:                  |  | Product Name:   | Conc.: | Efficiency: | Effective:                          | Observations: |
| Branson Ultrasonics            |  | GP  | 5      |             | <input checked="" type="checkbox"/> |               |
| Matchless Metal Polish Company |  | MC 580  | 5      |             | <input type="checkbox"/>            |               |
| Warren Chemical Company        |  | Sea Wash Neutral                                      | 5      |             | <input checked="" type="checkbox"/> |               |
| Water                          |  | Water   | 100    |             | <input type="checkbox"/>            |               |

Conclusion: Two of the cleaners tested yielded cleaner parts after being subjected to three minutes of ultrasonic cleaning at 130 F. The parts have been sealed and returned to the client for further evaluation of cleanliness.