

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2001
 DateRun: 02/05/2001
 Experimenters: Jason Marshall
 ClientType: Tool Manufacturer
 ProjectNumber: Project #2
 Substrates: Steel
 PartType: Part
 Contaminants: Abrasive, Buffing/Polishing Compounds, Greases
 Cleaning Methods: Ultrasonics
 Analytical Methods: Wipe
 Purpose: To evaluate selected cleaners on supplied parts.

Experimental Procedure: Five cleaners from the previous testing performed at SCL were diluted to the concentrations listed below using DI water in 250 mL beakers. A sixth solution of water was also used. Each solution was heated to 130 F in a Crest 40 kHz ultrasonic tank model 4Ht 1014-6 filled with water. Two ratchets were cleaned in each solution for 3 minutes. The parts were rinsed with a tap water spray for 30 seconds at 120 F. Parts were dried using a white paper towel. The towel was then evaluated for any signs of the contaminant mix. The parts were also observed in two locations to determine how well they were cleaned. A second and third dirty part were cleaned in each solution at 160 and 180 F following the same procedure as the 130 F.

SUBSTRATE MATERIAL: Steel Ratchet handles

CONTAMINANTS: Mix: Grease Stick (M.P. Iding Co, Fatty acid soap with Tallow), buffing compound (Jackson Lea Plastibrade F-18, 1332-58-7, 1344-09-8, 1344-28-1, 9000-70-8), Gritite (M.P. Iding Co.)

Results: All five chemistries were very effective in removing the contaminant from the ratchet handle. The same one area caused problems for each of the five cleaners. The area inside the ratchet head at the top of the ratchet did not get completely cleaned after the three minutes. The amount of contaminant remaining was far less at the elevated temperatures. Observations were made and points were assessed for each cleaner based on these observations. Table 1 lists the point system used by SCL. The observations made are listed in Table 2.

Table 1. Visual Observation Scale

| Scale | Points |
|-------|--------|
| X | 5 |
| E | 4.5 |
| GE | 4 |
| G | 3.5 |
| OG | 3 |
| O | 2.5 |
| FO | 2 |
| F | 1.5 |
| PF | 1 |
| P | 0.5 |
| Gone | 5 |

Table 2. Observations

| 40 kHz | 130 | | | | 160 | | 180 | |
|---------|------------|----------|----------|----------|----------|----------|----------|----------|
| Cleaner | Part 1 A | Part 1 B | Part 2 A | Part 2 B | Part 3 A | Part 3 B | Part 4 A | Part 4 B |
| 1 | OG | FO | F | F | OG | PF | G | O |
| 2 | F | FO | OG | FO | FO | OG | G | G |
| 3 | OG | FO | OG | O | OG | OG | OG | G |
| 4 | F | FO | G | OG | OG | O | OG | G |
| 5 | G | G | G | G | OG | OG | PF | PF |
| 6 | PF | P | NT | PF | NT | NT | NT | NT |
| Points | available: | | | 20pts | | 10pts | | 10pts |

The points for each cleaner at the three temperatures are listed in Table 3. The rating is based on points received divided by total points available and multiplying by 100%.

Table 3. Points and Ratings

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| | Total Points | Rating | Total Points | Rating | Total Points | Rating |
|---------|--------------|--------|--------------|--------|--------------|--------|
| Cleaner | 130 | deg F | 160 | deg F | 180 | deg F |
| 1 | 8 | 40 | 3 | 30 | 6 | 60 |
| 2 | 8.5 | 42.5 | 5 | 50 | 7 | 70 |
| 3 | 10.5 | 52.5 | 5 | 50 | 6.5 | 65 |
| 4 | 10 | 50 | 5.5 | 55 | 6.5 | 65 |
| 5 | 14 | 70 | 6 | 60 | 2 | 20 |
| 6 | 1.5 | 7.5 | 1 | 10 | 0 | 0 |

From Table 3, it appears that the EMKAY cleaner works best at the lower temperatures, but not so well at the 180 F. The Brulin cleaner was the most effective cleaner at the high temperature followed closely by the Valtech and Matchless products. It was noted that the parts were still not completely cleaned after the three-minute cleaning.

Summary:

| Substrates: | Steel | | | | |
|--------------------------------|---|--------|-------------|-------------------------------------|---------------|
| Contaminants: | Abrasives, Buffing/Polishing Compounds, Greases | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Electrochemical Products Inc | E Kleen 196 A | 10 | | <input type="checkbox"/> | |
| Brulin Corporation | Formula 815 GD | 5 | | <input checked="" type="checkbox"/> | |
| Valtech Corporation | Valtron SP 2250 2LF | 5 | | <input checked="" type="checkbox"/> | |
| Matchless Metal Polish Company | MC 132 | 5 | | <input checked="" type="checkbox"/> | |
| Emkay Chemical Company | Safety Wash | 5 | | <input checked="" type="checkbox"/> | |
| Water | Water | 100 | | <input type="checkbox"/> | |

Conclusion:

Despite the improvement in cleaning associated with the increased temperature, there was not any cleaners that removed all of the contaminant from the inside of the ratchet head. Additional cleaning trials will be conducted using the higher temperatures and using 25kHz ultrasonic tanks in an attempt to boost cleaning even further.