

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1998  
 DateRun: 01/23/1998  
 Experimenters: Carole LeBlanc, Jason Marshall  
 ClientType: Manufacturing  
 ProjectNumber: Project #1  
 Substrates: Alloys, Brass, Nickel, Stainless Steel  
 PartType: Part  
 Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Dirt, Films, Oil  
 Cleaning Methods:  
 Analytical Methods:  
 Purpose: List of alternatives to 1,1,1-trichloroethane.

Experimental Procedure: QUESTION #: 1  
 SUBSTRATE MATERIAL: Stainless Steel, Brass, others  
 QUESTION ASKED: This is a request for information on alternatives to using 1,1,1-trichloroethane. Our investigation for an alternative includes a direct replacement for 1,1,1-trichloroethane, as well as aqueous and non-aqueous processes. Enclosed you will find specification information on MVR-the model of the vapor degreasers we currently use.

For our critical cleaning applications, parts are placed in a vapor degreaser using TCA. On one of our products, this process is augmented by ultrasonic scrubbing in distilled TCA. Our standard cleaning procedure for critically cleaned components is similar to CGA standard 4.1 Cleaning procedures for oxygen service. However, we limit residue to a maximum of 10 mg per square foot of component surface. No amount of latent moisture, films, oils, or visible particulates are permitted. Additionally, our oxygen cleaning specification requires ultraviolet visual inspection for particulates - none are permitted. The metallic components we clean in TCA vary from small, easily cleaned pins, springs, etc., to more complex components (valve bodies, pistons, etc.) which have small passages. The materials we clean in TCA include austenetic (300 series) stainless steels, precipitation hardening stainless steels, free machining brass, nickel alloys (nickel, hastalloy, inconel, monel) and occasionally some cobalt alloys (eligiloy). Along with your recommendations, please include product information, material safety data sheets, equipment required, and pricing information.

Results: RESPONSE/ANSWER: In 1998, the Massachusetts Toxics Use Reduction Institute (TURI) will publish the results of the tests conducted at the Institutes Surface Cleaning Laboratory (SCL) in a searchable database/spreadsheet format. This should make alternative cleaner selection faster and easier. Here are the results of your query, based on the information supplied:

| SCL #       | Substrate | Contaminant  | Mechanism   | Cleaner                |
|-------------|-----------|--------------|-------------|------------------------|
| 95-410-01-2 | SS        | METAL        | ULTRASONICS | WR GRACE               |
| 95-410-01-2 | SS        | OIL          | ULTRASONICS | WR GRACE               |
| 96-422-01-2 | SS        | CARBON       | ULTRASONICS | DELTA<br>OMEGA<br>TECH |
| 97-539-03-4 | SS        | LUBRICANT    | ULTRASONICS | OAKITE                 |
| 97-539-03-4 | SS        | LUBRICANT    | ULTRASONICS | US<br>POLYCHEM         |
| 97-539-03-4 | SS        | LUBRICANT    | ULTRASONICS | WR GRACE               |
| 97-540-03-2 | SS        | BUFFING      | ULTRASONICS | WR GRACE               |
| 97-540-03-2 | SS        | FINGERPRINTS | ULTRASONICS | WR GRACE               |
| 97-540-03-2 | SS        | OIL          | ULTRASONICS | WR GRACE               |
| 97-547-01-2 | SS        | OIL          | ULTRASONICS | FINE<br>ORGANICS       |
| 97-547-01-2 | SS        | OIL          | ULTRASONICS | WR GRACE               |
| 97-549-01-2 | SS        | OIL          | ULTRASONICS | CHURCH &<br>DWIGHT     |
| 97-549-01-2 | SS        | OIL          | ULTRASONICS | GENERAL<br>CHEMICAL    |
| 97-549-01-2 | SS        | OIL          | ULTRASONICS | MACDERMID              |
| 97-549-01-2 | SS        | OIL          | ULTRASONICS | OAKITE                 |
| 97-549-01-2 | SS        | OIL          | ULTRASONICS | WR GRACE               |
| 98-440-04-4 | SS        | BUFFING      | ULTRASONICS | WR GRACE               |

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|             |           |              |               |                  |
|-------------|-----------|--------------|---------------|------------------|
| 98-440-04-4 | SS        | FINGERPRINTS | ULTRASONICS   | WR GRACE         |
| 98-440-04-4 | SS        | OIL          | ULTRASONICS   | WR GRACE         |
|             |           |              |               |                  |
| SCL #       | Substrate | Contaminant  | Mechanism     | Cleaner          |
| 95-405-04-2 | *BRASS    | GREASE       | IMMERSION     | OAKITE           |
| 95-405-04-2 | *BRASS    | OIL          | IMMERSION     | OAKITE           |
| 95-407-04-2 | BRASS     | WAX          | IMMERSION     | OAKITE           |
| 95-407-07-2 | BRASS     | LUBRICANT    | IMMERSION     | AW<br>CHESTERTON |
| 95-407-07-2 | BRASS     | OIL          | IMMERSION     | AW<br>CHESTERTON |
| 95-407-07-2 | BRASS     | WAX          | IMMERSION     | AW<br>CHESTERTON |
| 96-414-04-2 | BRASS     | NONE         | COMPATIBILITY | CALGON           |
| 96-414-04-2 | BRASS     | NONE         | COMPATIBILITY | WR GRACE         |
| 96-414-06-2 | BRASS     | BUFFING      | SPRAY         | WR GRACE         |
| 96-433-01-8 | BRASS     | BUFFING      | IMMERSION     | ARDROX           |

Summary:

Conclusion:

Cleaning projects vary from case-to-case. To obtain more detailed information about any of the listed trials, have the SCL # ready when contacting the lab at (978)934-3133.