

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2008

DateRun: 01/16/2008

Experimenters: Heidi Wilcox

ClientType: Metal Working

ProjectNumber: Project #1

Substrates: Brass

PartType: Coupon

Contaminants: Buffing/Polishing Compounds

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To find a drop in solvent alternative to TCE for vapor degreasing lighting fixtures

Experimental Procedure: Prewieghed 2 inch by 4 inch brass coupons were contaminated with one of three buffing compounds supplied by client. The red buffing compound was the most used and hardest to remove. The buffing compound was heated with a Master Appliance heat gun in order to transfer it to the coupons effectively. Once cool, coupons were reweighed to determine the amount of buffing compound added.

The coupons were then cleaned by immersion cleaning with stir bar agitation for 5 minutes in heated solutions at 85 F approximately. The coupons were removed from the solutions and wiped once with a paper towel, then let to cool and weighed a third time. The coupons were not rinsed.

All solvents used were used at 100% concentration. The solvents were picked by chemical class in order to try a wide range of solvents on the client's contaminant.

Results: Four of the six solvents removed the contaminant at an efficiency above 95%. One was lower, AK 225, at 83.33 percent and one was higher, DOW OS 30, at 103.70% removal efficiency. The OS 30 could possibly be damaging the brass, which is a soft metal, so it will not be used in further testing for this client. One HFC, Microcare, and the two nPB solvents will be looked at further and used in vapor degreasing client supplied parts. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon cleaned.

| Cleaner              | Initial wt | Final wt | % Removed |
|----------------------|------------|----------|-----------|
| AK 225               | 0.8915     | 0.3334   | 62.6      |
|                      | 0.7056     | 0.0157   | 97.77     |
|                      | 0.7301     | 0.0758   | 89.62     |
| Heavy Duty Degreaser | 0.8109     | 0.0037   | 99.54     |
|                      | 1.102      | 0.0064   | 99.42     |
|                      | 0.7564     | 0.0038   | 99.5      |
| Metalnox M6960       | 1.2294     | -0.0118  | 100.96    |
|                      | 0.7585     | -0.0009  | 100.12    |
|                      | 1.5134     | -0.0009  | 100.06    |
| Vertrel XP 10        | 1.1882     | 0.0147   | 98.76     |
|                      | 1.0978     | 0.0046   | 99.58     |
|                      | 0.8068     | 0.0989   | 87.74     |
| Lenium CP            | 0.7858     | 0.0061   | 99.22     |
|                      | 0.7668     | 0.0008   | 99.9      |
|                      | 0.7729     | 0.0006   | 99.92     |
| OS 30                | 0.7092     | -0.0786  | 111.08    |
|                      | 0.5177     | -0.0008  | 100.15    |
|                      | 1.3033     | 0.0016   | 99.88     |

Summary:

|                      |                             |               |                    |                                     |                      |
|----------------------|-----------------------------|---------------|--------------------|-------------------------------------|----------------------|
| <b>Substrates:</b>   | Brass                       |               |                    |                                     |                      |
| <b>Contaminants:</b> | Buffing/Polishing Compounds |               |                    |                                     |                      |
| <b>Company Name:</b> | <b>Product Name:</b>        | <b>Conc.:</b> | <b>Efficiency:</b> | <b>Effective:</b>                   | <b>Observations:</b> |
| AGA Chemical         | AK 225                      | 100           | 83.33              | <input type="checkbox"/>            |                      |
| Micro Care           | Heavy Duty Degreaser C      | 100           | 99.49              | <input checked="" type="checkbox"/> |                      |
| Kyzen Corporation    | Metalnox M6960              | 100           | 100.38             | <input checked="" type="checkbox"/> |                      |

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|                      |                                 |     |        |                                     |  |
|----------------------|---------------------------------|-----|--------|-------------------------------------|--|
| DuPont               | Vertrel XP 10                   | 100 | 95.36  | <input checked="" type="checkbox"/> |  |
| Petroferm Inc        | Lenium CP (no longer available) | 100 | 99.68  | <input checked="" type="checkbox"/> |  |
| Dow Chemical Company | OS 30                           | 100 | 103.70 | <input type="checkbox"/>            |  |

**Conclusion:**

Heated immersion testing on the clients most frequently used buffing compound was done using solvents that are potential drop in replacements for TCE in the companies vapor degreaser. Four of the 6 solvents tested are possible candidates for the next step of vapor degreasing client supplied parts.