

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1998
 DateRun: 06/03/1998
 Experimenters: Jason Marshall
 ClientType: State Highway Department
 ProjectNumber: Project #1
 Substrates: Aluminum
 PartType: Coupon
 Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric
 Purpose: Determine if temperature would aid cleaners

Experimental Procedure: The same three oils were used to contaminate the pre-weighed aluminum coupons. The coupons were placed in an oven for 20 minutes at 160 F. Coupons were allowed to cool to room temperature and weighed again. Three coupons were placed in each cleaner for two minutes with stir bar agitation at 130 F. Coupons were then rinsed in tap water for 30 seconds also at room temperature. Parts were air-dried and then weighed one more time.

SUBSTRATE MATERIAL: Al-202-6061 T-4
 CONTAMINANTS: Citgo Cutting Oils 425 & 120, Sliderite 220

Results: Table 1 list the cleaning efficiencies of the three aqueous cleaners at the elevated temperatures. The two WR Grace products increased their effectiveness, and the Safe CleanUp product showed no signs of improving.

Table 1 Cleaning Efficiencies

| @ 130 deg F | Daraclean | Daraclean | Safe Clean Up |
|-------------|-----------|-----------|---------------|
| | 282 | 232 | SupNeut |
| Coupon 1 | 84.3 | 68.7 | 92.9 |
| Coupon 2 | 59.2 | 86.8 | 87.7 |
| Coupon 3 | 72.4 | 82.9 | 87.9 |
| Average | 72 | 79.5 | 89.5 |
| Std Dev | 12.6 | 9.53 | 2.95 |

Table 2 compares the cleaning efficiencies of the heated and unheated aqueous cleaners from trials 2 and 3.

Table 2 Comparison of Cleaning Efficiencies

| CLEANER | Efficiency @ Room Temp | Efficiency @ 130 deg F |
|----------------------------|------------------------|------------------------|
| WR Grace Daraclean 282 | 62.8 | 72.0 |
| WR Grace Daraclean 232 | 45.2 | 79.5 |
| Safe CleanUp Super Neutral | 90.7 | 89.5 |

The Daraclean 232 had the greatest increase when heated, up almost 35%, followed by the 282, up about 10%, and the Super-Neutral down slightly.

Summary:

| | | | | | |
|------------------------|----------------------|---|--------------------|-------------------------------------|----------------------|
| Substrates: | | Aluminum | | | |
| Contaminants: | | Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Safe CleanUp Solutions | Super Neutral | 10 | 89.50 | <input checked="" type="checkbox"/> | |
| Magnaflux | Daraclean 282 | 10 | 72.00 | <input type="checkbox"/> | |
| Magnaflux | Daraclean 232 | 10 | 79.50 | <input type="checkbox"/> | |

Conclusion: Temperature helped to increase the efficiency of two aqueous cleaners. The increased efficiencies were still lower than the third cleaner.