CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2002

DateRun: 02/26/2002

Experimenters: Jason Marshall

ClientType: Plating Job Shop

ProjectNumber: Project #1

Substrates: Steel

PartType: Part

Contaminants: Lubricating/Lapping Oils

Cleaning Methods: Mechanical Agitation

Analytical Methods: Gravimetric, Visual

Purpose: To evaluate successful cleaner on supplied parts

Experimental Procedure: The cleaning product was diluted to 10% using DI water in a 600 ml beaker and heated to 130 F on a hot plate. The clean parts were weighed and then coated with the New England Industrial Lubricant NEILCCut 333. The parts were then weighed again. Three parts were cleaned for 5 minutes and three other parts were cleaned for 10 minutes, both using stir-bar agitation. Parts were rinsed in tap water at 120 F and dried using a Master Appliance heat gun at 500 F for 1 minute. Parts were weighed a final time and efficiencies were calculated. Afterwards, it was decided that efficiencies would be improved through the additional of additional mechanical energy. Two parts were cleaned using air sparging for 10 minutes. The parts that were sent to the lab dirty,(coated with Mobil Oil Co Mobilarma 245 (64742-88-7) were cleaned in a similar manner. The parts were only visually inspected for cleanliness. Eight parts were cleaned at both times.

Results: After weighing the parts, excess water was noticed on the parts. This water resulted in a low cleaning efficiency for both cleaning times. Parts were dried for an additional 2 minutes and reweighed. The increased drying time yielded significant increases to the effectiveness for both times. The air sparging along with the increased drying had the highest efficiency, 95%. The following table list the calculated efficiencies for each cleaning time and drying time.

Cleaner	Coupon 1	Coupon 2	Coupon 3	Average	Std Dev	
5 min	74.63	87.10	57.70	73.14	14.76	
10 min	61.28	73.21	87.01	73.83	12.88	
5 min	86.87	89.53	82.03	86.14	3.80	More drying
10 min	90.62	91.88	93.04	91.85	1.21	More drying
10 min	93.12	98.13		95.63	3.54	Air Sparging

The parts that were sent to the lab dirty appeared to be free from any residual lubricant. From the previous trials, it appears that the Mobilarma is the easier of the two lubricants to clean.

Summary:

Substrates:	Steel				
Contaminants:	Lubricating/Lapping Oils				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	10	86.14	☐	5 minute, extra drying
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	10	91.85	☐	10 minute, extra drying
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	10	95.63	☑	air sparging
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	10	0.00	☑	visual removal of Mobilarma 245

Conclusion: The Gemtek SC Aircraft & Metal cleaner was shown to be an effective cleaner for both the lubricants supplied to the lab. The additional mechanical energy (air sparging) helped to increase the cleaning process. Additional forms of mechanical energy that could be supplied (in additional to or in place of the sparging) are, rotational, vibrational or ultrasonic energy.