CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2001

DateRun: 11/19/2001

Experimenters: Jason Marshall

ClientType: Metal

ProjectNumber: Project #1

Substrates: Steel

PartType: Coupon

Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To compare ultrasonics and immersion cleaning at shorter cleaning time

Experimental Procedure: Two sets of the five cleaners from previous trial were made into 5% solutions in 600 ml beakers. Fiver were heated to 130 F in a Crest 40 kHz ultrasonic tank and the other five were heated to 130 F on a hot plate. Thirty preweighed coupons were coated with the rust preventative using a plastic eyedropper. Coupons sat overnight and were reweighed. Three coupons were cleaned for 20 seconds with ultrasonic and immersion cleaning. Each set of coupons were rinsed with tap water at 120 F for 30 seconds and dried using a heat gun at 500 F for 1 minute. Once coupons cooled, final weights were recorded and cleaning efficiencies were calculated.

Results: The ultrasonic cleaned coupons looked cleaner than the immersion cleaned coupons. The rinse water from the ultrasonic cleaning had less oil in it than the immersion rinse water did. The following table lists the efficiencies for both immersion and ultrasonic cleaning.

Table 1. Efficiencies

	Cleaner	Coupon 1	Coupon 2	Coupon 3	Average
Immersion	Multikleen	99.70	99.39	96.24	98.44
	Inproclean	98.85	97.46	96.68	97.66
	Beyond	98.85	96.53	98.49	97.96
	Dasco	98.16	98.00	97.69	97.95
	Certa	92.01	95.27	94.92	94.07
Ultrasonics	Multikleen	99.99	100.06	99.92	99.99
	Inproclean	100.38	100.12	99.94	100.15
	Beyond	99.92	100.06	99.93	99.97
	Dasco	100.00	99.70	97.96	99.22
	Certa	99.74	98.87	97.46	98.69

Summary:

Substrates:	Steel				
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Heatbath Corporation	Multi-Kleen 1568	5	98.44	☐	Immersion
Heatbath Corporation	Multi-Kleen 1568	5	99.99	☑	Ultrasonics
Oakite Products	Inproclean 3800	5	97.66	☐	Immersion
Oakite Products	Inproclean 3800	5	100.15	☑	Ultrasonics
Today & Beyond	Beyond 2001	5	97.96	☐	Immersion
Today & Beyond	Beyond 2001	5	99.97	☑	Ultrasonics
DA Stuart Company	Dasco Kleen 3250	5	97.95	☐	Immersion
DA Stuart Company	Dasco Kleen 3250	5	99.22	☑	Ultrasonics
Houghton International	Cerfa Kleen 5387	5	94.07	☐	Immersion
Houghton International	Cerfa Kleen 5387	5	98.69	☑	Ultrasonics

Conclusion: The ultrasonic cleaning at 20 seconds was more effective than cleaning with immersion. The ultrasonic cleaning removed nearly 100% of the rust preventative, where as the immersion cleaning removed between 94 and 98%.