CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2001

DateRun: 11/06/2001

Experimenters: Jason Marshall

ClientType: Metal

ProjectNumber: Project #1

Substrates: Steel

PartType: Coupon

Contaminants: Coatings

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To compare ultrasonic and immersion cleaning.

Experimental Procedure: Two solutions for each of the five cleaners were diluted to 5% using DI water in 600 mL beakers. One set of beakers were heated to 130 F in a Crest 40 kHz ultrasonic tank. The second set was heated to 130 on a hot plate.
Thirty preweighed coupons were coated with the Houghton Veto C3 contaminant and allowed to sit for 2 hours. A second weighing was performed. Three coupons were cleaned in each solution for 3 minutes. Fifteen coupons were cleaned in the ultrasonic tank and the other coupons were cleaned using stir-bar agitated immersion. After cleaning, coupons were rinsed in tap water at 120 F for 30 seconds and dried using a heat gun at 500 F for 1 minute. Once the coupons returned to room temperature, final weights were measured and efficiencies were calculated.

Results: The ultrasonic energy was found to be more successful than the immersion cleaning was. The following table lists the calculated results for both methods.

Cleaner	Contaminant	Coupon 1	Coupon 2	Coupon 3	Average	Previous Results
Multikleen	Ultrasonics	99.99	99.77	99.83	99.86	97.88
Inproclean	Ultrasonics	99.93	99.56	100.01	99.83	99.32
Beyond	Ultrasonics	99.87	100.11	100.05	100.01	99.26
Dasco	Ultrasonics	100.02	100.03	100.04	100.03	93.11
Certa	Ultrasonics	100.06	99.70	100.03	99.93	96.86
Multikleen	Immersion	99.88	99.65	99.17	99.57	99.59
Inproclean	Immersion	99.93	99.70	99.58	99.74	99.99
Beyond	Immersion	99.71	98.72	99.48	99.30	99.44
Dasco	Immersion	98.74	97.53	98.22	98.16	99.27
Certa	Immersion	99.09	99.26	99.64	99.33	98.15

Comparison of this data to the previous trial data revealed that the ultrasonic cleaning was more effective in a cleaner solution. The new immersion cleaning results were nearly identical to the previous trial results.

Summary:

Substrates:	Steel				
Contaminants:	Coatings				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Heatbath Corporation	Multi-Kleen 1568	5	99.86	☑	ultrasonics
Heatbath Corporation	Multi-Kleen 1568	5	99.57	☐	Immersion
Oakite Products	Inproclean 3800	5	99.83	☑	ultrasonics
Oakite Products	Inproclean 3800	5	99.74	☐	Immersion
Today & Beyond	Beyond 2001	5	100.01	☑	ultrasonics
Today & Beyond	Beyond 2001	5	99.30	☐	Immersion
DA Stuart Company	Dasco Kleen 3250	5	100.03	☑	ultrasonics
DA Stuart Company	Dasco Kleen 3250	5	98.16	☐	Immersion
Houghton International	Cerfa Kleen 5387	5	99.93	☑	ultrasonics
Houghton International	Cerfa Kleen 5387	5	99.33	☐	immersion

Conclusion:

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When comparing similar bath solutions (fresh), ultrasonic cleaning was found to be more effective than the immersion cleaning was for removing the rust preventative.