

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2023
 DateRun: 07/31/2023
 Experimenters: Amelia Wagner
 ClientType: Tool Manufacturer
 ProjectNumber: Project #2
 Substrates: Steel
 PartType: Coupon
 Contaminants: Adhesive, Resins/Rosins
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric
 Purpose: To find an effective solvent to remove varnish from steel coupons

Experimental Procedure: Three steel coupons were used for each cleaner tested, for a total of nine coupons. Initial weights of coupons were taken. The varnish was heated to 350 F on a hot plate. Each coupon was placed on the hot plate for a total of 30 seconds. The varnish was then applied to the heated coupons with a metal scraper in order to achieve a thin layer of varnish on the bottom third of the coupons. Once the varnish had solidified, dirty weights of each coupon were taken. Coupons were then subjected to 15 minutes of unheated immersion with a stir bar set at 200 rpm. The chosen solvents/cleaners tested were A. D Limonene 85% + Dimethyl Glutarate 15%, B. Fatty Acid Methyl Ester 93% + Ethyl Lactate 7%, C. T-Butyl Acetate 42% + Benzyl Benzoate 58%. After air drying, clean weights were taken.

Results:

Cleaner	Initial wt of cont.	Final wt of cont.	%Cont Removed	% AVG
D Limonene 85% + Dimethyl Glutarate 15%	0.0360	0.0008	97.78	96.71
	0.1125	0.0067	94.04	
	0.0297	0.0005	98.32	
FAME 93% + Ethyl Lactate 7%	0.0143	0.0043	69.93	60.58
	0.0289	0.0048	83.39	
	0.0820	0.0587	28.41	
T-Butyl Acetate 42% + Benzyl Benzoate 58%	0.0579	0.0566	2.25	5.70
	0.0663	0.0609	8.14	
	0.0610	0.0569	6.72	

Summary:

Conclusion: D Limonene 85% + Dimethyl Glutarate 15% was very effective in removing the varnish from the coupons using 15 minutes of unheated immersion.