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.