

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2023

DateRun: 05/31/2023

Experimenters: Amelia Wagner

ClientType: Tool Manufacturer

ProjectNumber: Project #2

Substrates: Stainless Steel

PartType: Coupon

Contaminants: Greases, Oil

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To test two solvents in cleaning oil and grease from stainless steel as an alternative to TCE using unheated ultrasonics.

Experimental Procedure: Two solvents were identified previously using the Hspip software; SB-33 (D-limonene 85% +Dimethyl glutarate 15%) and SB-31 (Benzyl alcohol 63% + Ethyl lactate 37%). Twelve stainless steel coupons were chosen and initial weights of each were recorded. Half of the coupons were soiled with Hocut 795 and half were soiled with RI-780. The soils were applied to the bottom third of each coupon using a swab. The coupons were then cleaned by their respective solvent using a method of unheated ultrasonics. The coupons were immersed and subjected to ultrasonics agitation for 15 minutes . The coupons were then removed and left to dry overnight. The next morning clean weights were recorded.

Results:

Cleaner	Soil	Substrate	Initial wt of cont.	Final wt of cont.	%Cont Removed	% AVG	% Overall
SB-33	Hocut 795	Stainless Steel	0.0351	0.0098	72.08	87.75	84.25
		Stainless Steel	0.1139	0.0062	94.56		
		Stainless Steel	0.2239	0.0076	96.61		
	RI 780	Stainless Steel	0.0405	0.0060	85.19	80.75	
		Stainless Steel	0.0371	0.0072	80.59		
		Stainless Steel	0.0238	0.0056	76.47		
SB-31	Hocut 795	Stainless Steel	0.1013	0.0677	33.17	52.37	61.64
		Stainless Steel	0.3055	0.0712	76.69		
		Stainless Steel	0.1693	0.0893	47.25		
	RI 780	Stainless Steel	0.0399	0.0149	62.66	70.91	
		Stainless Steel	0.0419	0.0173	58.71		
		Stainless Steel	0.0370	0.0032	91.35		

The coupons associated with solvent SB-31 had pools of solvent remaining after being left to air dry overnight.

Summary:

Conclusion: SB-33 is an effective solvent in removing the soils from stainless steel coupons using unheated ultrasonics. SB-31 is not an effective solvent in removing the soils from stainless steel coupons using unheated ultrasonics. SB-31 may prove to be more effective with an added drying step after the cleaning application.