CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2004

DateRun: 05/06/2004

Experimenters: Jason Marshall

ClientType: Tool Manufacturer

ProjectNumber: Project #1

Substrates: Steel

PartType: Coupon

Contaminants: Paints

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric

Purpose: To evaluate successful products on third supplied soil

Experimental Procedure: Nine cleaners were selected based on client request for vapor degreasing solvents. All products were used heated to 96 F on a hot plate in 250 ml beakers. The process utilized no water rinse and only used ambient air to dry the parts.
Twenty-seven preweighed steel coupons were coated with a varnish mix containing Cooper's Creek Chemicals, Cooper Black Tank Paint No 739 (64742-89-8, 8052-42-4, 108-88-3); Sherwin Williams Company, V74B2 Black Asphaltum coating (64742-89-8, 64742-88-7, 8052-42-4) using a hand held swab. The oil was then heated with a Master Appliance Heat gun at 300 F for 10 minutes. After cooling to room temperature, a second weighing was performed to determine the amount of soil that was added. Three coupons were cleaned in each solution for 5 minutes with minimal stir-bar agitation. After drying, coupons were weighed a final time to determine the cleaning efficiency of each product.

Results: Five of the nine products removed over 97% of the varnish in five minutes of immersion cleaning. The table lists the amount of soil added, the amount remaining and the efficiency for each coupon.

Cleaner	Initial wt	Final wt	% Removed
Ak 225	0.0825	0.0612	25.82 (Paint peeling)
	0.0582	0.0299	48.63
	0.2139	0.1562	26.98
Vertrel CCA	0.1419	0.0980	30.94
	0.2263	0.1477	34.73
	0.1158	0.0803	30.66
Flux Remover C	0.1147	0.0865	24.59
	0.0874	0.0695	20.48
	0.1276	0.0995	22.02
HFE 7200	0.1784	0.1522	14.69
	0.0777	0.0733	5.66
	0.1300	0.1151	11.46
Ensolv	0.0850	0.0017	98.00
	0.0385	0.0017	95.58
	0.0997	0.0020	97.99
Ensolv A	0.0817	0.0020	97.55
	0.2707	0.0027	99.00
	0.1999	0.0023	98.85
Metalnox M6960	0.1420	0.0005	99.65
	0.1522	0.0035	97.70
	0.2053	0.0022	98.93
Solvon PB	0.1371	0.0004	99.71
	0.2841	0.0005	99.82
	0.1712	0.0007	99.59
Solvon IP	0.0704	0.0017	97.59
	0.0971	0.0012	98.76
	0.1262	0.0009	99.29

Summary:

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Substrates:	Steel
Contaminants:	Paints

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
AGA Chemical	AK 225	100	33.81	☐	
DuPont	Vertrel CCA	100	32.11	☐	
Micro Care	Flux Remover C	100	22.36	☐	
3M	HFE 7200	100	10.60	☐	
Enviro Tech International Inc	Ensolv	100	97.19	☑	
Enviro Tech International Inc	Ensolv A	100	98.47	☑	
Kyzen Corporation	Metalnox M6960	100	98.76	☑	
Poly Systems USA Inc	Solvon Kreussler PB	100	99.71	☑	
Poly Systems USA Inc	Solvon Kreussler IP	100	98.55	☑	

Conclusion: The five products that were successful at removing the varnish should be tested using vapor degreasing.