CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2020

DateRun: 09/15/2020

Experimenters: Justin Kiander

ClientType: Metal Finishing

ProjectNumber: Project #1

Substrates: Cold Rolled Steel

PartType: Part

Contaminants: Oil

Cleaning Methods: Immersion/Soak

Analytical Methods: Visual, Contact Angle (Surface Tension)

Purpose: The purpose of this experiment was to determine the effectiveness of 4 cleaners on removing vanishing oil from company provided solvent cleaned cold rolled steel piano hinges.

Experimental Procedure: A company provided TCE cleaned piano hinges as a baseline for cleanliness. Initial contact angles were determined for the cleaned parts. The piano hinges were then soiled with the vanishing oil and immersed for 15 minutes in the heated cleaners. After 15 minutes, hinges were placed into a deionized water bath at 115°F for 20 seconds. Hinges were then dried with an air gun on the hot setting until dry. Contact angles for the newly cleaned areas were obtained and compared to original contact angles. Effectiveness of the cleaners was determined based on contact angle and visual observations.

Results:

Cleaner	Initial Contact Angle	Initial AVG	Final Contact Angle	Final AVG
Metalnox 6386	65.58	59.28	70.35	66.25
	58.35		67.81	
	53.92		60.58	
Mirachem 500	73.09	63.85	89.97	87.54
	55.61		86.4	
	62.85		86.26	
SC Aircraft & Metal	51.83	54.89	37.75	45.59
	64.68		52.14	
	48.16		46.87	
Shopmaster LPH	56.49	59.77	87.06	88.46
	65.97		90.87	
	56.84		87.45	

Summary:

Substrates:	Cold Rolled Steel
Contaminants:	Oil

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Kyzen Corporation	Metalnox M6386	100%	0.00	☐	Average contact angle of 66.25
Mirachem Corporation	Mirachem 500	20%	0.00	☑	Average contact angle of 87.54
Gemtek Products	SC Aircraft & Metal Cleaner Super Concentrate	20%	0.00	☐	Average contact angle of 45.59
Buckeye International	Shopmaster LPH	20%	0.00	☑	Average contact angle of 88.46

Conclusion: All cleaners visually removed the vanishing oil, but Mirachem 500 and Shopmaster LPH were the most effective cleaners showing significant improvement to contact angle values. Next steps would be to test on galvanized steel parts with Mirachem 500 and Shopmaster LPH.