CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2023

DateRun: 09/14/2023

Experimenters: Alexander Symko, Amelia Wagner

ClientType: University

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Paints

Cleaning Methods: Immersion/Soak

Analytical Methods: Gravimetric, Visual

Purpose: Determining an effective replacement to Methyl Ethyl Ketone (MEK) in cleaning wet paint from the inside of a siphoned paint gun

Experimental Procedure: 5 alternatives were identified and selected for testing. These were, Ethylene Glycol, D-Super Remover, Diethyl Carbonate, Isopropanol (70%), Dimethyl Carbonate, and Methyl Acetate. Aluminum C1020 alloy coupons were rated on a visual cleanliness scale, with 5 being completely dirty, and 1 being completely clean, with 3 coupons for each cleaner for experimental redundancy. Paint and Primer mixture provided by client were mixed in a 1:1 ratio and applied to the bottom section of the aluminum coupons as per industrial testing standard procedure. The coupons were then rated with the wet paint present to get dirty rating values. The coupons were then immersed in the cleaner such that the painted portions were completely submersed, and a magnetic stir bar was used to stir the solution for 30 minutes. After 30 minutes had passed, the coupons were removed and allowed to dry overnight. The following day, the coupons were once again rated for visual cleanliness, and the least effective options were eliminated for subsequent testing.

Results:

Cleaner	Coupon	Average Dirty Values	Average Clean Values
Ethylene Glycol	16	5	5
	17	5	5
	18	5	5
D Super Remover	19	5	1.5
	20	5	2
	22	5	2
Diethyl Carbonate	24	5	3
	28	5	3.5
	30	5	3.5
Isopropanol	31	5	3.5
	35	5	4
	36	5	4
Dimethyl Carbonate	16	5	4
	17	5	4.5
	18	5	4.5
Methyl Acetate	19	5	3
	20	5	3.5
	22	5	3

Summary:

Conclusion: In conclusion, ethylene glycol, Isopropanol, and Dimethyl Carbonate were removed from further testing as they were the least effective options in this test. D Super Remover, Diethyl Carbonate, and Methyl Acetate were selected as cleaners for the next round of testing.