CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2024

DateRun: 02/07/2024

Experimenters: Amelia Wagner

ClientType: Coatings Manufacturer

ProjectNumber: Project #1

Substrates:

PartType: Part

Contaminants: Adhesive

Cleaning Methods: Immersion/Soak

Analytical Methods: HSPiP

Purpose: Determine a safer alternative for cleaning applications to remove two types of glue adhesives using Hansen Solubility Parameters in Practice (HSPiP).

Experimental Procedure: Small pieces of the client's two adhesives were immersed in each solvent vial for five minutes. A rating system of zero to five was developed to the efficiency of the solvent in its ability to dissolve the adhesives. If little to no soil was dissolved, the solvent would receive a zero (0), and if most or all soil was dissolved, the solvent would receive a one (1). The ratings were entered into the HSPiP software, and a sphere was generated from that data. The sphere itself was not utilized further, as the purpose of the HSP testing was to identify solvents that could be used as alternative cleaners as opposed to finding solvent blends.

Parameters:

All=100% dissolved

Most= >90% dissolved

Some= >=1% dissolved

None= 0% dissolved

1= Most/All

0= Some/None

HSP Chemicals:

(1) Toluene, (2) Dimethyl Carbonate, (3) Xylenes, (4) Benzyl Alcohol, (5) Ethylene Glycol, (6) Methyl Acetate, (7) Undecane, (8) Ethyl Lactate, (9) Acetone, (10) Ethyl Acetate, (11) Methanol, (12) Ethanol, (13) 1,3-Dioxolane, (14) Diethyl Carbonate, (15) 1-Propanol, (16) Isopropanol, (17) Propylene Carbonate, (18) Thiophene, (19) 1-Methoxy-2 Propanol, (20) Dimethyl Sulfoxide (DMSO), (21) 1-Butanol, (22) Dimethyl Glutarate, (23) Anisole, (24) 2-Botoxyethyl Acetate

Results:

#	Solvent	Final Appearance Adhesive 5017	Final Appearnce Adhesive 5024
1	Toluene	1	1
2	Dimethyl Carbonate	0	0
3	Xylenes	1	1
4	Benzyl Alcohol	1	0
5	Ethylene Glycol	0	0
6	Methyl Acetate	1	1
7	Undecane	1	1
8	Ethyl Lactate	0	0
9	Acetone	1	0
10	Ethyl Acetate	1	1
11	Methanol	0	1
12	Ethanol	0	0
13	1,3-Dioxolane	1	1
14	Diethyl Carbonate	1	1

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15	1-Propanol	1	0
16	Isopropanol	0	1
17	Propylene Carbonate	0	0
18	Thiophene	1	1
19	1-Methoxy-2 Propanol	0	0
20	Dimethyl Sulfoxide (DMSO)	0	0
21	1-Butanol	1	0
22	Dimethyl Glutarate	1	0
23	Anisole	1	1
24	2-Botoxyethyl Acetate	1	0

Summary:

Conclusion: Four solvents were chosen for future testing; Anisole, Methyl Acetate, Ethyl Acetate, and Diethyl Carbonate.

These solvents were chosen because they either scored a 1 for both adhesives, or they scored a 1 for the first adhesive and while not dissolving the second adhesive they were able to soften the second adhesive to a point that it would be easy to remove from a surface. These solvents also have lower P2OASys hazard scores than the original cleaner of the client.