

CLEANING LABORATORY EVALUATION SUMMARY

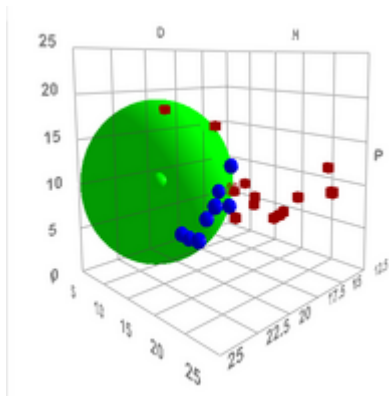
SCL #: 33
 DateRun: 06/27/2024
 Experimenters: Alexander Symko
 ClientType: Manufacturing
 ProjectNumber: Project #1
 Substrates: Laminate
 PartType: Coupon
 Contaminants: Adhesive
 Cleaning Methods: Immersion/Soak
 Analytical Methods: HSPiP

Purpose: Determining an effective solvent for removing hot-melt adhesive from laminate substrate

Experimental Procedure: 24 strips of laminate were cut such that they were of equal size and were able to fit through the neck of a scintillation vial. Each of these laminate strips were then soiled by melting a single bead of jowatherm 288.60 hot-melt adhesive onto the surface. The coupons were then allowed to soak for 3 hours, with observations being taken every hour. A 1 rating denotes most or complete de-adhesion of the adhesive from the substrate, while a 0 rating means some of or none of the adhesive was de-adhered from the substrate. Once these values were obtained, a HSPiP Solvency sphere was generated to further examine the solubility of the target adhesive.

| Results: | Solvent | 1 Hr | 2 Hrs | 3 Hrs |
|----------|-----------------------|------|-------|-------|
| | Toluene | 1 | 1 | 1 |
| | Dimethyl Carbonate | 0 | 0 | 0 |
| | Xylenes | 1 | 1 | 1 |
| | Benzyl Alcohol | 0 | 0 | 0 |
| | Ethylene Glycol | 0 | 0 | 0 |
| | Methyl Acetate | 0 | 0 | 0 |
| | Undecane | 0 | 0 | 0 |
| | Ethyl Lactate | 0 | 0 | 0 |
| | Acetone | 0 | 1 | 1 |
| | Ethyl Acetate | 0 | 1 | 1 |
| | Methanol | 0 | 0 | 0 |
| | Ethanol | 0 | 0 | 0 |
| | 1,3-Dioxolane | 1 | 1 | 1 |
| | Diethyl Carbonate | 0 | 0 | 1 |
| | 1-Propanol | 0 | 0 | 0 |
| | Isopropanol | 0 | 0 | 0 |
| | Propylene Carbonate | 0 | 0 | 0 |
| | Thiophene | 1 | 1 | 1 |
| | 1-methoxy-2-propanol | 0 | 0 | 0 |
| | Dimethyl Sulfoxide | 0 | 0 | 0 |
| | 1-Butanol | 0 | 0 | 0 |
| | Dimethyl Glutarate | 0 | 0 | 0 |
| | Anisole | 1 | 1 | 1 |
| | 2-butoxyethyl acetate | 0 | 0 | 0 |

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Conklin HSP Sphere

Summary:

Conclusion:

Toluene, Xylenes, 1,3-Dioxolane, Thiophene, and Anisole were effective at or before the 1 hour mark for de-adhering the adhesive from the laminate. Acetone and Ethyl Acetate were effective at the 2 hour mark, and Diethyl Carbonate was effective at the 3 hour mark. Based on these results, a sphere was generated and the next experiment will utilize solvent blends generated through the solvent optimizer.