

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2006
 DateRun: 05/17/2006
 Experimenters: Jason Marshall
 ClientType: General
 ProjectNumber: Project #2
 Substrates: Plastic
 PartType: Part
 Contaminants: Paints
 Cleaning Methods: Ultrasonics
 Analytical Methods: Visual

Purpose: To evaluate additional products for paint/ink removal from supplied products

Experimental Procedure: Nine additional products were selected from the lab's database of test results based on client supplied information. One product was used at 30%, two products were mixed to 50-50 mix and the remaining seven were used at full strength. Each product was heated to 150 F in a 40 kHz ultrasonic tank. One golf ball was cleaned in each solution for 30 minutes. At the end of the cleaning, the ball was rinsed in a tap water spray for 15 seconds at 120 F and wiped dry with a paper towel. Observations were made and compared to the client's current cleaner. An additional 30 minutes of cleaning was included if the alternative started to remove the paint and ink.

| Results: | Alternative | Observation |
|----------|-------------------|---|
| | DBE 5/6 | Slightly less removal of paint than Actisolv |
| | Actisolv | Little change from the previous trial at 130 F |
| | | Still had paint left on golf ball |
| | Inproclean 4000 T | Excellent removal at 30 minutes. Paint could be peeled off along with the ink. Still had some paint left. |
| | | With additional cleaning time the alternative may have started to affect the plastic ball |
| | Pinene | No change in paint |
| | Ionox HC2 | Some coating may have been removed. Less shine |
| | Bio T Max | No change in paint |
| | Soy Gold 2000 | No change in paint |
| | EP 921 | Removed a lot of the paint; However the ball was damaged |
| | DS 104 | Removed some of the paint. |

Summary:

| Substrates: | Plastic | | | | |
|---------------------------|------------------------------------|--------|-------------|-------------------------------------|---------------|
| Contaminants: | Paints | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Invista S.a.r.l | Flexisolv DBE 5 ester | 50 | | <input checked="" type="checkbox"/> | |
| Gemtek Products | SC Actisolv Safety Solvent | 100 | | <input checked="" type="checkbox"/> | |
| Oakite Products | Inproclean 4000 T | 30 | | <input checked="" type="checkbox"/> | |
| Finger Lakes Chemical | FLSC-31 Pinene All Purpose Cleaner | 100 | | <input type="checkbox"/> | |
| Kyzen Corporation | Ionox HC 2 | 100 | | <input checked="" type="checkbox"/> | |
| Bio Chem Systems | Bio T Max | 100 | | <input type="checkbox"/> | |
| AG Environmental Products | Soy Gold 2000 | 100 | | <input type="checkbox"/> | |
| Inland Technologies Inc | EP 921 | 100 | | <input type="checkbox"/> | |

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|-------|---------------------|-----|--|-------------------------------------|--|
| Dysol | DS 104 Wipe Solvent | 100 | | <input checked="" type="checkbox"/> | |
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Conclusion: Only a few alternatives showed limited success in removing the paint from the golf ball.