

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2008
 DateRun: 04/30/2008
 Experimenters: Jason Marshall
 ClientType: Machining Company
 ProjectNumber: Project #1
 Substrates: Aluminum
 PartType: Coupon
 Contaminants: Inks
 Cleaning Methods: Manual Wipe
 Analytical Methods: Visual

Purpose: To evaluate previously tested product at lower concentrations for cleaning the six inks.

Experimental Procedure: Coupons were coated with each of the six supplied inks. These included Dykem Stop Off, Markal Valve Action Paint marker, Nu-Mark marker, Sharpie permanent marker, Sakura Coatings Product Company Solid Marker and the Avery Marks-A-Lot permanent marker (black). Once dry, coupons were cleaned using a handheld swab that was immersed into the cleaning product. Cleaning lasted for up to 2 minutes. Following the cleaning, the coupons was wiped once to dry surface. Observations were made and recorded.

Three dilutions were evaluated: 40%, 20% and 10%. If the dilution required under one minute to be effective, then a lower concentration also was evaluated. If the dilution took longer than a minute and a half, a higher concentration was evaluated.

Results: The two most challenging inks for the diluted product were blue sharpie and the black Avery Marks-a-lot marker. The easiest to remove was the Nu Marker, which was cleaned at 10% in less than 20 seconds.

| Contaminant | Dilution | Observations |
|--------------|----------|---------------------------|
| Dykem | 40% | 40 seconds to clean |
| | 20% | 90 seconds |
| Markal | 20% | 20 seconds |
| | 10% | 40 seconds |
| Nu Mark | 20% | 15 seconds |
| | 10% | 15 seconds |
| Sharpie | 20% | 120 seconds - 90% removed |
| | 40% | 60 seconds - 95% removed |
| Solid Yellow | 20% | 90 seconds |
| | 40% | 90 seconds |
| Marks-a-lot | 20% | 120 seconds -95% removed |
| | 40% | 60 seconds - 95% removed |

Summary:

| | | | | | |
|----------------------|----------------------|---------------|--------------------|-------------------------------------|----------------------|
| Substrates: | | Aluminum | | | |
| Contaminants: | | Inks | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Vertec BioSolvents | VertecBio Gold 3 | 20 | | <input checked="" type="checkbox"/> | |

Conclusion: The Vertec Bio Gold 3 was found to be effective on the six contaminants when diluted with water. The 20% dilution may be the best choice for a universal concentration for all six inks.