

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1998
 DateRun: 09/02/1998
 Experimenters: Jason Marshall
 ClientType: Name Plate Mfg-Etching
 ProjectNumber: Project #1
 Substrates: Aluminum
 PartType: Part
 Contaminants: None
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Visual

Purpose: To determine if aqueous cleaner from previous trial will remove the paint.

Experimental Procedure: Initial weights of 6 customer supplied coupons were recorded. Two cleaning solutions were made from one product. One solution was a 5% solution made with DI water in a 600 mL beaker and heated to 130 F. The other was a 100% solution at room temperature. Three coupons were placed in each cleaning chemistry. The coupons in the 5% solution were weighed at 15, 30, 45, 60, 120 and 240 minutes. At each interval coupons were rinsed in tap water at room temperature for 20 seconds and air dried. The 100% solution was only weighed after 24 hours.
 SUBSTRATE MATERIAL: Aluminum 3003 with paint (not to be removed)
 CONTAMINANTS: None

Results: The 5% solution turned from a clear solution to slightly orange after the first interval, which would indicate paint removal. The 100% solution changed color after 4 hours. It was noted that all the coupons gained weight during their soaking periods. In conjunction with the color change, the weight gains may indicate the paint is absorbing the cleaning solution, causing swelling of the paint. After the coupons were removed from the solutions, the soaked coupons were compared to non-soaked coupons. There was a definite color change between the coupons. Also, the 100%-soaked coupons had a gritty texture to them after the 24 hour soaking. Table 1 list the weight changes for the 5% solution and Figure 1 shows a graphical representation of the weight gain versus time. Table 2 contains the data for the 100% solution which is graphically represented in Figure 2.

Table 1. Weight Gains for 5% at 130 F

| Coupon # | Time (min) | | | | | | |
|----------|------------|---------|---------|---------|---------|---------|---------|
| | 0 | 15 | 30 | 45 | 60 | 120 | 240 |
| 1 | 11.3724 | 11.3801 | 11.3895 | 11.394 | 11.3992 | 11.4168 | 11.3942 |
| 2 | 11.2766 | 11.2831 | 11.2918 | 11.2953 | 11.2993 | 11.31 | 11.3118 |
| 3 | 11.4864 | 11.4921 | 11.5035 | 11.5082 | 11.5095 | 11.5133 | 11.5057 |

Table 2. Weight Gains for 100% at RT

| Coupon # | 4 | 5 | 6 |
|------------|---------|---------|---------|
| Initial Wt | 11.3470 | 11.3616 | 11.3393 |
| Final Wt | 11.4232 | 11.4592 | 11.4120 |

Summary:

| | | | | | |
|----------------------|----------------------|---------------|--------------------|--------------------------|----------------------|
| Substrates: | | Aluminum | | | |
| Contaminants: | | None | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Chrisal USA Inc | Super CMF 240 | 5 | | <input type="checkbox"/> | |
| Chrisal USA Inc | Super CMF 240 | 100 | | <input type="checkbox"/> | |

Conclusion: The Chrisal product was determined to cause removal of the paint from the aluminum surface. The next test will be conducted using the AG Environmental Soy Gold 1000 product. Additional testing will be performed to find other possible cleaners.