

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1998
DateRun: 03/25/1998
Experimenters: Jason Marshall
ClientType: Coatings Manufacturer
ProjectNumber: Project #1
Substrates: Stainless Steel
PartType: Coupon
Contaminants: Coatings
Cleaning Methods:
Analytical Methods: Goniometry, OSEE
Purpose: Compare coatings on stainless steel and cardboard

Experimental Procedure: Three stainless steel coupons were pre-weighed using an electronic balance. Initial OSEE and LCAG readings were taken. In OSEE measurements, eight readings were taken for the coupons. Each recording is taken from a different location on the samples surface due to the nature of the test. The surface readings vary with time. Readings were made when the number displayed peaked and settled briefly. For LCAG readings, a small (2 micro L) drop of water is placed on the surface. The laser is directed toward the water-substrate interface and the resulting angle of deflection is recorded from the image produced on the protractor-like screen. Eight readings were taken on the surface in order to insure a proper distribution. For both tests, the average for each coupon is calculated.
The coupons were coated following the procedure provided by the client. Before the coupons were placed in the oven, a second weighing was performed. After the samples were removed from the oven and allowed cooled down to ambient conditions, the final weights were recorded. OSEE and LCAG readings were also taken again at eight different locations on each coupon.

SUBSTRATE MATERIAL: Stainless Steel

COATING: 7426 + CH6--grey--1.7% Solids

COATING PROCESS USED: Applied coating onto a glass rod using a plastic pipet. Ran glass rod across surface of the metal coupon. Dried coating for four minutes at 105 F in a conventional oven.

Results: The readings obtained from the second coating were behaved in the same manner as the first coating. As the coating was applied the OSEE readings went down and the LCAG angles increased. Table 1 lists the pre- and post-coating readings for both tests.

Table 1. OSEE and LCAG Readings

	OSEE		LCAG	
COUPON #	PRE	POST	PRE	POST
21	19.4	4.13	14.5	88.3
22	27.8	4.13	30.5	87.5
23	29.1	8	29	87.5

As the second coating was applied to the coupons, a more uniform coating was obtained than the previous trial. This characteristic allowed for more consistent readings for both tests. Also, the coating weights were all about the same amount. See Table 2 for the wet and dry weights.

Table 2 Coating Weight (g)

COUPON #	WET	DRY
21	0.083	0.0042
22	0.08	0.0046
23	0.068	0.003

The coating on coupon #23 was slightly less than the other two. As seen in the post-coating OSEE results, this lower weight caused the reading to be higher than the other two similar coating weights. For the LCAG, there was no discernible difference between all three coupons.

Summary:

Conclusion: Coatings from both trials demonstrated similar characteristics through the use of OSEE and LCAG readings. Both coatings on the stainless-steel coupons will be compared to the cardboard coated samples in the next trial.