CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	1999
DateRun:	08/30/1999
Experimenters:	Jason Marshall
ClientType:	Consultant
ProjectNumber:	Project #1
Substrates:	Liquid
PartType:	Part
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil
Cleaning Methods:	
Analytical Methods:	Surfactant Titration
Purpose:	To compare surfactant levels of a cleaning solution

Experimental Procedure:

To compare surfactant levels of a cleaning solution before & after passing through separation equipment (Aqueous Recovery Resources, Inc., Suparator, oil-water separator) and a virgin sample of the solution. Three titrations were per sample were tested for cationic surfactant content using Bama Chem Nonionic Surfactant Kit. The general procedure is as follows:
1. Add 50 ml of water to the vial.
2.Add 0.50 ml sample (see note at bottom)
3. Add 4 drops of Quat 1.
4. If the solution is pink, add drops of Quat 3 until blue. If the solution is blue to start with, proceed to step 5.
5. Add drops of Quat 2 until just pink, and then add two more drops.
6. Count the number of drops of Quat 4 it takes to reach the blue endpoint.
7. Percent by volume cationic surfactant = number of drops x factor = number of drops x 0.44 (for 0.5 ml) also, weight of cationic surfactant in sample = number of drops x 0.00165 grams (100% Quat)
NOTE: The best sample size to take depends on the percent of active material in the blend. If it is suspected that the sample is:
3-6% active, take 1.0 ml and use factor of 0.22
6-10% active, take 0.5 ml and use factor of 0.44
Unknown, take 0.1 ml and use factor of 2.20
The chemistries used were:

SITE	CLEANER MFR	PRODUCT	NOTES
Racine	Howard Supply Co	LT-5-100 Soak Cleaner	10 oz/gal (~8% by volume)
Racine	Howard Supply Co	LT-5-100 Soak Cleaner	Influent to Superator
Racine	Howard Supply Co	LT-5-100 Soak Cleaner	Effluent from Superator

Results:

From the titration of the three samples using the Bama Chem Cationic test method, it was clear that the Superator did not decrease the effectiveness of the cleaning solutions. The effluent sample was nearly identical to the virgin solution and was higher in cationic volume percent than the influent sample. Table 1 lists the calculations made for each solution.

Site	Racine		
Product	Influent 1	Effluent 1	Virgin 1
Concentration oz/gal	10	10	10
%by vol	~8	~8	~8
Volume Used	0.1	0.1	0.1
Number of Drops	7	9	11
Correction Factor	2.2	2.2	2.2
Volume of Surfactant %by vol	15.4	19.8	24.2
Product	Influent 2	Effluent 2	Virgin 2
Concentration oz/gal	10	10	10

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%by vol	~8	~8	
Volume Used	0.5	0.5	0.5
Number of Drops	30	44	45
Correction Factor	0.44	0.44	0.44
Volume of Surfactant %by vol	13.2	19.36	19.8
Product	Influent 3	Effluent 3	Virgin 3
Concentration	10	10	10
%by vol	~8	~8	~8
Volume Used	0.5	0.5	0.5
Number of Drops	40	50	52
Correction Factor	0.44	0.44	0.44
Volume of Surfactant %by vol	17.6	22	22.88

Table 2 lists the average values for the three samples evaluated.

Table 2. Average Cationic Concentrations

Influent	Effluent	Virgin
15.4	20.39	22.29

Summary:

Conclusion: The cationic concentrations as calculated suggest that the Superator does not decrease the effectiveness of the cleaning solutions as the solution is passed through the oil/water separator.