

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1997
 DateRun: 08/17/1997
 Experimenters: Jason Marshall, Prashant Trivedi
 ClientType: Cutting Fluids Manufacturer
 ProjectNumber: Project #1
 Substrates: Liquid
 PartType: Part
 Contaminants:
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Shake method
 Purpose: To reformulate the clients product

Experimental Procedure: The purpose of the experiment was to reformulate the clients product using their base oil and eliminating the use of current solvent. Three propriety replacement chemicals were selected (A, B, and C) to be mixed with the oil on a percent volume ratio. Mixtures were made up of 80% base oil and 20% replacement chemistry. The resulting product was then visually observed to determine stability. Several readings were recorded at different time intervals (0, 15min, 30min, 60min, 21/2hours, 5hrs, and 22hrs). At each period, the amount of separation that had taken place was measure in millimeters and any notable observations were documented.
 SUBSTRATE MATERIAL: Liquid-Tapping oil formulation
 CONTAMINANTS: NA

Results: Table 1 list the three replacement chemistries and their separation levels and the notable observations.
 Table 1 Product Reformulation Data

Replacement Chemistry	0 min	15 min	30 min	60 min	2.5 hrs	5 hrs	22 hrs
A	23.2 mL	23.2mL	23.2mL	23.2 mL	23.2 mL	23.2 mL	23.2 mL
Total volume	3.8 cm	3.8 cm	3.8 cm	3.9 cm	3.9 cm	3.9 cm	3.9 cm
Separated Out	small bubbles throughout	small bubbles almost gone	few bubbles left	no bubbles	no change	no change	no change
Observation:							
B	23.5 mL	23.5 mL	23.5 mL	23.5 mL	23.5 mL	23.5 mL	23.5 mL
Total volume	4.9 cm	5.0 cm	5.0 cm	5.0 cm	5.0 cm	5.0 cm	5.0 cm
Separated Out	bubbles throughout	most of bubbles gone	bubbles all gone	no change	no change	no change	no change
Observation:							
C	23.05 mL	23.05 mL	23.05 mL	23.05 mL	23.05 mL	23.05 mL	23.05 mL
Total volume	0.05 cm	0.05 cm	no change	no change	no change	no change	no change
Separated Out	very few bubbles	no bubbles	no change	no change	no change	no change	no change
Observation:							

From the data obtained, replacement chemistry C appears to be the most stable of the three choices. Sample C had the lowest amount of separation that did not change over the observed time period.

Summary:

Conclusion: Sample C has been determined to be the most stable mixture of the three replacement chemistries selected. Having determined a replacement chemistry compatible with the carrier oil, a lower concentration sample (10% by volume) will be made up and sent to the client to be tested for product functionality. Special consideration should be given to flammability/flash point of the blend, since the solvent replacement is a developmental chemistry.