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 Total volume Separated Out Observation:	23.2 mL 3.8 cm small bubbles throughout	23.2mL 3.8 cm small bubbles almost gone	23.2mL 3.8 cm few bubbles left	23.2 mL 3.9 cm no bubbles	23.2 mL 3.9 cm no change	23.2 mL 3.9 cm no change	23.2 mL 3.9 cm no change
B Total volume Separated Out Observation:	23.5 mL 4.9 cm bubbles throughout	23.5 mL 5.0 cm most of bubbles gone	23.5 mL 5.0 cm bubbles all gone	23.5 mL 5.0 cm no change	23.5 mL 5.0 cm no change	23.5 mL 5.0 cm no change	23.5 mL 5.0 cm no change
C Total volume Separated Out Observation:	23.05 mL 0.05 cm very few bubbles	23.05 mL 0.05 cm no bubbles	23.05 mL no change no change	23.05 mL no change no change	23.05 mL no change no change	23.05 mL no change no change	23.05 mL no change no change

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.