CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2019

DateRun: 12/31/1969

Experimenters: Sabrina Apel, Othon Pagounes

ClientType: Medical Instrument Mfr

ProjectNumber: Project #1

Substrates: Titanium

PartType: Part

Contaminants: Oil

Cleaning Methods: Ultrasonics

Analytical Methods: Visual

Purpose: Five sets of 26-28 titanium parts were provided pre-contaminated with J2. Cleaners were heated to vendor recommended temperatures before immersing the parts into an ultrasonic tank for 15 minutes. Visual observations were recorded overall with notes and a set of three parts per cleaner were evaluated by three lab technicians, labelled A-C in Table 1, for cleaner and contaminant residue according using the rating key below.

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Rating Key:

Rating Key	
1	No Residue
2	Slight Residue
3	Noticeable Residue
4	Considerable Residue
5	Severe Residue

Results: Table 1: Visual Rating Results

Cleaner	Conc. (%)	Temp. (°F)	Before Cleaning Rating			After Cleaning Rating			Average Score
			A	B	C	A	B	C	
Dowanol PnBGE	100	100	4	5	4	2	2	1.5	2
Ozzy Juice SW 3	100	110				3	4	2.5	3
Metalnox M6386	100	130				1	1	1.5	1
Sta-Sol ESS 160	100	106				2	2	1.5	2
Liquinox	1	150				5	5	5	5

Visual Observations:

Dowanol PnBGE - Slight cleaner residue and soil residue that remained on parts after cleaning.

Ozzy Juice SW3 - Slight cleaner residue and soil residue that remained on parts after cleaning.

Metalnox M6386 - No cleaner residue or soil residue on parts after cleaning

Sta-Sol ESS-160 - No cleaner residue or soil residue on parts after cleaning, however, it took a while for the parts to completely dry

Liquinox - Cleaner residue and soil residue remained on parts after cleaning. Cleaner will need a rinse step going forward with testing.

Summary:

Substrates:	Titanium				
Contaminants:	Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**

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Dow Chemical Company	Dowanol PnBGE	100%	2.00	☑	Visual Rating
Chem Free Corporation	SW-3 Ozzy Juice (Improved Low Odor)	100%	3.00	☐	Visual Rating
Kyzen Corporation	Metalnox M6386	100%	1.00	☑	Visual Rating
JR Hess & Co., Inc.	Sta-Sol ESS 160	100%	2.00	☑	Visual Rating
Alconox Inc	Liquinox	1%	5.00	☐	Visual Rating

Conclusion: Dowanol PnBGE, Metalnox 6386, and Sta-Sol ESS 160 were the most effective at removing J2 soil from titanium parts using heated ultrasonics.