CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2003
DateRun:	06/04/2003
Experimenters:	Jason Marshall
ClientType:	Medical Instrument Mfr
ProjectNumber:	Project #1
Substrates:	Nickel, Titanium
PartType:	Part
Contaminants:	Lubricating/Lapping Oils
Cleaning Methods:	
Analytical Methods:	Microphotography, Performance Test, Visual
Purpose:	To determine a methodology to determine if parts are clean
Experimental Procedure:	Several analytical methods were investigated on supplied parts cleaned at SSL.

Results:

Method Used	Observations
Visual	Slits in end of tubes were visually inspected with using the naked eye. Area to fine to observe soil levels
Microphotography	Again, the slits in the end of the tubes were visually inspected using a Olympus 5 X magnification. Digital images were captured using a Sony CCD IRIS High Resolution digital camera. Under magnification, a side-by-side comparison revealed that the cleaned part had less lubricant than the uncleaned part. Higher magnification would may provide better comparative results.
Filtration	Using 25 ml of Isopropyl alcohol, the cleaned part was rinsed in a glass Petri dish for 30 seconds. The isopropyl alcohol was then filter through a preweighed glass fiber filter. Filters were dried using a Master Appliance Heat Gun at 500 F for 15 seconds. The filters were allowed to sit for 30 minutes before final weights were made. This method resulted in inconclusive data. The table below shows results for two parts and a blank filter. The blank filter and the uncleaned part were basically the same while the cleaned part showed the greatest increase.

Table of Filtration Results

Part	Initial	Final	Amount collected
Blank	0.1237	0.1266	0.0029
Clean	0.118	0.1246	0.0066
Dirty	0.1185	0.1211	0.0026

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Observations

Performance Test	The tubes were attached to a dry air line. The end of the tube was inserted into a latex glove that was tied off at the end (to simulate the balloon). Air was turned on and run until the glove filled up to the size of medium hand. The air was shut off and the gloves were inverted and visually inspected for signs of particulate. The uncleaned part resulted in one glove having tiny black spots across the glove. A second glove only had black around the entry point of the part. The cleaned part left no visible signs of contamination.

Summary:

Conclusion: The performance test appears to have the greatest potential for analyzing cleaning effectiveness of the nickel/titanium tubes.