CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2008

DateRun: 08/13/2008

Experimenters: Jason Marshall

ClientType: Nano manufacturing

ProjectNumber: Project #1

Substrates: Glass/Quartz

PartType: Part

Contaminants: Adhesive, Clay, Oxides

Cleaning Methods: Ultrasonics

Analytical Methods: Visual

Purpose: To evaluate selected products for removing nano materials from glass apparatus.

Experimental Procedure: Three products were selected from the lab's on-line database of cleaning alternatives, www.cleanersolutions.org, based on client supplied information. One product was used at 2.5% based on vendor recommended concentrations. The other two products were used at 20%. Water was included for comparative purposes. Products were used at room temperature. Each solution was used in a 40 kHz Branson 1510 ultrasonic unit after being degassed for 5 minutes.

One end of the supplied glass part was immersed into the ultrasonic tank and cleaned for 5 minutes. Following cleaning, parts were rinsed with a tap water spray for 1 minute at room temperature. The cleaned part was dried with compressed air at room temperature for 30 seconds. Observations were made to determine how well each solution worked.

Results: All four products were able to remove the nanoclay that was on the surface of the inside diameter of the glass cooling column. However, water was not able to remove the oxide layer that was in the inner jacket of the tube. The Citranox had some success with the oxide layer. OmniBrite Acid and the Valtron SP 2700 KB worked very well on the oxide layer. The table lists the observations made for each cleaning solution.

Cleaner	Observation
Water	Removed nanoclay
	No effect on the oxide layer
	No removal of the adhesive on the end of the tube
Citranox	Removed nanoclay
	Removed some of the oxide layer
	Softened the adhesive on the end of the tube
SC OmniBrite	Removed nanoclay
	Removed the oxide layer
	Softened the adhesive on the end of the tube more than Citranox
Valtron 2700 kb	Removed nanoclay
	Removed the oxide layer better than OmniBrite
	Softened the adhesive on the end of the tube more than

Summary:

Substrates:	Glass/Quartz				
Contaminants:	Adhesive, Clay, Oxides				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Water	Water	100	0.00	☐	
Alconox Inc	Citranox	2.5	0.00	☐	
Valtech Corporation	Valtron SP 2700 KB	20	0.00	☑	
Gemtek Products	SC OmniBrite Acid	20	0.00	☑	

Conclusion: The two effective products will be evaluated to determine how long to clean the glass part for to remove a majority of the contaminants.