

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2026

DateRun: 04/23/2026

Experimenters: Amelia Wagner

ClientType: Manufacturers of Surgical Tools and Equipments

ProjectNumber: Project #1

Substrates: Stainless Steel, Titanium, Zirconium

PartType: Coupon

Contaminants: Oil

Cleaning Methods: Ultrasonics

Analytical Methods: Gravimetric

Purpose: To test the efficacy of aqueous cleaners and detergents in removing machining oil from sample parts using ultrasonics.

Experimental Procedure: Three sample parts of each part type were grouped together and assigned to one of each of the cleaners to be cleaned. The three sample parts of each part type were weighed together using a gravimetric balance and had their initial weights recorded. Each sample part was then immersed in the provided Swisscut Ortho NF-X US 24 Machining Oil for 2 minutes. During the 2-minute immersion in the oil, the parts were inverted twice to aid in the filling of blind holes and complex thread geometry. The parts were then removed and re-weighed in their groups of three to have their dirty weights recorded. The parts were then subjected to 5 minutes of unheated ultrasonics cleaning in their respective cleaner. Once removed from ultrasonics immersion, each part was individually tried utilizing a pressurized air stream for 30 secs.

Results:	Cleaner	Part	Initial wt of cont.	Final wt of cont.	%Cont Removed	% AVG
BG-Clean 402 10%		Sterile Nealing	0.0327	0.0014	95.72	95.41
		BLX	0.1119	0.0021	98.12	
		Basel Screw	0.0158	0.0008	94.94	
		Variobase	0.0605	0.0023	96.20	
		BLT-NC	0.0589	0.0040	93.21	
		BLC-WB	0.0751	0.0034	95.47	
		Analog	0.0531	0.0038	92.84	
		TLX	0.0678	0.0022	96.76	
Crystal Simple Green 10%		Sterile Nealing	0.0379	0.0000	100.00	96.38
		BLX	0.1065	0.0036	96.62	
		Basel Screw	0.0193	0.0001	99.48	
		Variobase	0.0632	0.0006	99.05	
		BLT-NC	0.0651	0.0049	92.47	
		BLC-WB	0.0896	0.0038	95.76	
		Analog	0.0565	0.0032	94.34	
		TLX	0.0657	0.0044	93.30	
Micro 90 2%		Sterile Nealing	0.0337	0.0000	100.00	97.98
		BLX	0.0997	0.0006	99.40	
		Basel Screw	0.0169	0.0002	98.82	
		Variobase	0.0581	0.0007	98.80	
		BLT-NC	0.0584	0.0034	94.18	
		BLC-WB	0.0737	0.0022	97.01	
		Analog	0.0425	0.0004	99.06	
		TLX	0.0757	0.0026	96.57	
Alconox 2%		Sterile Nealing	0.0315	-0.0005	101.59	101.26
		BLX	0.1048	-0.0014	101.34	

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Basel Screw	0.0171	-0.0015	108.77
Variobase	0.0785	-0.0016	102.04
BLT-NC	0.0681	0.0001	99.85
BLC-WB	0.0997	-0.0003	100.30
Analog	0.0535	0.0017	96.82
TLX	0.0623	0.0004	99.36

Parts with small threading (BLT-NC, BLC-WB, and TLX) as well as the Analog (due to its wide circumference) parts were the most difficult to fully dry with the pressurized air blow off. This could account for lower cleaning efficacy of these parts compared to other parts.

Several of the parts cleaned with Alconox show a cleaning efficacy percentage larger than 100%. This could be indicative of incompatibility between the Alconox and the substrates of the sterile nealing, BLX, basel screw, variobase, and BLC-WB parts.

Summary:

Substrates:	Stainless Steel, Titanium, Zirconium				
Contaminants:	Oil				
Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Amiran BioChemicals	BG-Clean 402	10%	95.41	☒	
Simple Green	Crystal Simple Green Industrial Cleaner & Degreaser	10%	96.38	☒	
International Products Corporation	Micro 90 Conc.	2%	97.98	☒	
Alconox Inc	Alconox	2%	101.26	☐	

Conclusion:

The BG-Clean 402, Crystal Simple Green, and Micro 90 can be considered effective as they all showed over 75% efficacy. The Micro 90 showed the highest overall removal of 97.98%. The Alconox may be incompatible with certain substrates leading to the degradation of the surface.