CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	1999
DateRun:	02/18/1999
Experimenters:	Jason Marshall
ClientType:	Bolt, Screw & Nut Manufacturer
ProjectNumber:	Project #1
Substrates:	Alloys, Nickel, Stainless Steel
PartType:	Coupon
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil
Cleaning Methods:	Low Pressure Spray
Analytical Methods:	Visual, microscopic
Purpose:	To evaluate the effectiveness of the cleaning solutions on client supplied parts.
Experimental Procedure:	Five percent solutions were made of the two successful cleaning chemistries from the previous test. A 12-liter solution of each was required for operation of the Miele Automatic G7735 Spay Wash Unit. The solutions were heated to 140 F on hot plates. After five minutes of cleaning, the parts were rinsed in a tap water spray at 120 F for one minute and dried using a Master Appliance Corp, Hot-air gun model HG-301A at 500 F for one minute. Parts were then packaged and returned to the client for additional observations. SUBSTRATE MATERIAL: Parts: Stainless Steel 302 & 304, Nickel Alloy - M400 and 651 Silicone Bronze CONTAMINANTS: Machine Lubricating oil S-50 (CAS#s: 64742-54-7, 64742-57-0), Die coolant oil W-373 (CAS#s: 64741-44-2, 64742-53-6, 64742-52-5), Drawing Compound/Lubricant Apex SPS-92 (Borax CAS#: 1303-96-4; Potassium Nitrate CAS#: 7758-09-0) and Steel Skin 4166 (Sulfur CAS#: 7704-34-9; Calcium Hydroxide CAS#: 01305-62-0; Molybdenum Disulfide CAS#: 1317-33-5; Stearates)
Results:	Four parts were photographed prior to cleaning using a Polaroid Microcam SLR camera at ~10x magnification. These same four parts were then photographed after cleaning. Pictures were taken for the sides facing the spray source and also for the sides opposite the spay. It was noted that the sides opposite the spray heads were not as clean as the sides facing the spray. Figures 1, 2, 3 and 4 display the four different parts in several pictures. The first is the dirty picture, the second and third are the post cleaning for the spray side and the opposite side. The two nuts had an additional picture taken of the flat side from the dirty picture (not facing spray or opposite to spray).

Left top = Dirty
Right top = Spray Side
Left bottom = Opposite side
Left top = Dirty
Right top = Spray side
Left bottom = Clean
Right bottom = Opposite side
Left top = Dirty
Right top = Spray side
Left Bottom = Opposite side
Left top = Dirty
Right top = Spray side
Left bottom = Clean
Right bottom = Opposite side

Summary:

Substrates:	Alloys, Nickel, Stainless Steel				
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
US Polychem Corporation	Polyspray Jet 790 P	5		☑	

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Ardrox Inc	6333	5		☐	

Conclusion: The US Polychem Polyspray 790 P appeared to clean the parts better than the Ardrox 6333. It was noted that the side of the part exposed to the direct line of the spray stream was cleaned much better than the opposite side. An additional cleaning was performed on parts. The test procedure was the same except the parts were cleaned for five minutes and then the parts were turned over to expose the opposite side to the spray. Parts were then cleaned for another five minutes. This system of cleaning proved to be more effective in removing the contaminants from the parts. All cleaned parts have been packaged and returned to the client for further evaluation.