

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1997  
 DateRun: 09/29/1997  
 Experimenters: Jason Marshall, Off Site  
 ClientType: Recycling Company  
 ProjectNumber: Project #1  
 Substrates: Teflon  
 PartType: Part  
 Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil  
 Cleaning Methods: Supercritical Extraction  
 Analytical Methods: Black light  
 Purpose: Evaluate CO2 cleaning for Teflon shavings.  
 Experimental Procedure: A sample of the Teflon shavings was sent to an outside source to be cleaned using Supercritical cleaning. The general operating conditions were:  
 Temp: 50 C  
 Static Conditions(15 min): 5000 psi  
 Dynamic Conditions(30 min): 9000 psi  
 CO2 Flow Rate (gas): 3 L/min  
 Vessel Size: 24 ml  
 These settings are the vendor's standard conditions when working with an unknown and when they attempt to determine feasibility. Conditions are not optimized.  
 Supercritical CO2 cleaning is a dissolution process, which means that the contaminates are solvated into the Supercritical CO2 and evacuated into a low pressure chamber. The contaminants then become insoluble and precipitate out to form liquid CO2. Supercritical CO2 methods are used for specialized precision applications. The process is well suited for cleaning complex parts and penetrating small pores and crevices.  
 SUBSTRATE MATERIAL: Teflon shavings  
 CONTAMINANTS: Oils

Results: After receiving the Teflon shavings from the vendor, the shavings were analyzed for cleanliness using an ultraviolet light. This method was selected due to the fact the contaminant fluoresced. The cleaned shavings were compared to an uncleaned sample. Supercritical CO2 cleaning did prove to be an effective means of removing the contaminant from the Teflon.

Summary:

<b>Substrates:</b>	Teflon				
<b>Contaminants:</b>	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil				
<b>Company Name:</b>	<b>Product Name:</b>	<b>Conc.:</b>	<b>Efficiency:</b>	<b>Effective:</b>	<b>Observations:</b>
No Specific Vendor	Carbon Dioxide Supercritical	100	0.00	<input checked="" type="checkbox"/>	

Conclusion: Having determined the effectiveness of supercritical CO2 cleaning, it now must be decided if the implementation of the necessary equipment would be feasible for the clients. Listed below is some vendors and contact names of supercritical CO2 cleaning equipment. Also included is approximate costs of this equipment.

Yale West  
 Applied Separations  
 Allentown, PA  
 (610)770-0900 Telephone  
 (610)740-5520 Fax  
 \$16000 - \$21500