# CLEANING LABORATORY EVALUATION SUMMARY

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| SCL #: | 1997 |
| DateRun: | 09/30/1997 |
| 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:**

| **Substrates:** | Teflon | | | | |
|---|---|---|---|---|---|
| **Contaminants:** | Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil | | | | |
| **Company Name:** | **Product Name:** | **Conc.:** | **Efficiency:** | **Effective:** | **Observations:** |
| No Specific Vendor | Carbon Dioxide Supercritical | 100 | | ☑ | |

**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