CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2002
DateRun:	07/23/2002
Experimenters:	Jason Marshall, Fred Youngs
ClientType:	General
ProjectNumber:	Project #1
Substrates:	Other
PartType:	Coupon
Contaminants:	Paints, Solvent
Cleaning Methods:	Low Pressure Spray
Analytical Methods:	Drager Tubes
Purpose:	To evaluate exposure for traditional spray can and Enviro Caddie system
Experimental Procedure:	A 12" x 12" x 12" Acrylic Spray Chamber lined with paper towels was used to contain paint sprayed. Background levels for organic vapor were measured using an OVM, Thermo Environmental Instruments, Inc - Model 580 B. Dragger tubes were used to measure for Acetone, Ethyl Benzene, Toluene & Xylene. Paint was sprayed for 2 seconds into the acrylic chamber. A reading was taken with the OVM at T = 0, at T = 10 seconds and then when level (T ~ 2 minutes). The OVM reading was repeated for each of the 4 Dragger tube measurements. Paper towels were changed between spraying in order to reduce residual vapors. Temperature and humidity were recorded to be 72.2 F and 68%.
Results:	The measurements for the Drager tubes for the four compounds resulted in levels. The results are listed in the table below.

Traditional Spray Can	Enviro Caddie System
Background Readings	Background Readings
OVM 6.7 ppm	OVM 9.6 ppm
Acetone No Color Change	Acetone No Color Change
Ethyl Benzene No Color Change	Ethyl Benzene No Color Change
Toulene No Color Change	Toulene No Color Change
Xylene No Color Change	Xylene No Color Change
Traditional Spray Can System	Enviro Caddie System
OVM	OVM
Max: 569 ppm	Max: 1198 ppm
Steady State: 567 ppm	Steady State: 1185 ppm
Acetone 10 pumps = 2500 ppm	Acetone 10 pumps = 4500 ppm
OVM	OVM
Max: 570 ppm	Max: Over Range (2000) ppm
Steady State: 570 ppm	Steady State: 1151 ppm
Ethyl Benzene 6 pumps = 175 ppm	Ethyl Benzene 6 pumps = 185 ppm
OVM	OVM
Max: 520 ppm	Max: 1215 ppm

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Steady State: 520 ppm	Steady State: 1215 ppm
Toulene 5 pumps = 225 ppm	Toulene 5 pumps = 210 ppm
OVM	OVM
Max: 569 ppm	Max: 1250 ppm
Steady State: 567 ppm	Steady State: 1250 ppm
Xylene 2 of 5 pumps = 400 ppm	Xylene 2 of 5 pumps = 350 ppm
Corrected Xylene = 1000 ppm	Corrected Xylene = 875 ppm

The Enviro Caddie paint delivered more Acetone than the traditional system (4500 to 2500). Both systems delivered similar amounts of Ethyl Benzene (185 to 175) and Toluene and (210 to 225). The Enviro Caddie paint had more than twice the total organic vapor than the traditional system did (1200 to 543).

Summary:

Conclusion:

Note: Even though both paints did not contain the same components, readings were obtained for the four chemicals. This would be due to the cross sensitivities of the individual Drager Tubes used.

Cross Sensitivity
Acetone: Other ketones can be indicated but at different sensitivity. Aldehydes are also indicated but not esters.
Ethyl Benzene: A number of petroleum hydrocarbons and aromatic compounds are also indicated at differing sensitivity.
Toluene: Xylenes are also indicated (with less sensitivity). Benzene changes color of the indicator to pale yellow. Petroleum hydrocarbons change the color to a reddish brown.
Xylene: Styrene, vinyl acetate, toluene, ethyl benzene and acetaldhyde are also indicated at lower sensitivity. 400 ppm ethyl acetate does not interfere with reading.