

# 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 ppm	6.7	OVM ppm	9.6
Acetone Color Change	No	Acetone Color Change	No
Ethyl Benzene Color Change	No	Ethyl Benzene Color Change	No
Toulene Color Change	No	Toulene Color Change	No
Xylene Color Change	No	Xylene Color Change	No
Traditional Spray Can System		Enviro Caddie System	
OVM		OVM	
Max: ppm	569	Max: ppm	1198 ppm
Steady State: ppm	567	Steady State: ppm	1185 ppm
Acetone 10 pumps = 2500 ppm		Acetone 10 pumps = 4500 ppm	
OVM		OVM	
Max: ppm	570	Max: Over Range (2000) ppm	
Steady State: ppm	570	Steady State: ppm	1151 ppm
Ethyl Benzene 6 pumps = 175 ppm		Ethyl Benzene 6 pumps = 185 ppm	
OVM		OVM	
Max: ppm	520	Max: ppm	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 acetaldehyde are also indicated at lower sensitivity. 400 ppm ethyl acetate does not interfere with reading.