

3500 LABORATORY & FIELD TEST EVALUATIONS

TABLE OF CONTENTS

I. Laboratory Evaluations

Compound(s)	Evaluator	Summary
a. Toluene	Kitazato University, Japan	Four levels from 10-200 ppm were generated in a test chamber and monitors exposed to these concentrations over varying time intervals.
b. Toluene and Toluene mixture with Iso Butane, Acetone, and Perchloroethylene	Technical Research Center of Finland	The Center ran controlled laboratory comparisons of the #3500 vs. standard charcoal tubes and low flow pumps. The compounds studied were Toluene, a mixture of Toluene and Iso Butyl Alcohol, Acetone, and Perchloroethylene. Chamber concentrations were checked by Micron IA infrared and by direct GC analysis.
c. Styrene/Acetone mixture	Jutlandish Institute of Technology, Denmark	The Jutlandish Institute of Technology in Denmark performed a laboratory comparison of a Styrene and Acetone mixture using #3500 OVM and SKC standard charcoal tubes. Low flow pumps were used for the SKC tubes and both systems were exposed for four hours.
d. Vinyl Chloride	Chemical Company (anonymous)	An airstream containing 0.61 ppm of VC was passed over the #3500 for fifteen minutes at two liters per minute. Relative Precision at 95% confidence level was 15% for the #3500 and 114% for the tube.
e. Dichloromethane, 1, 2 Dichloroethane, Tetrachloroethylene, Heptane	3M OH & SP Division	Data show that the #3500 is gas tight. This data is valid in its conclusions only when the compound is stable. The data relates storage time to recovery coefficients (Desorption Efficiency).
f. Enflurane		A study at an eastern U.S. university was carried out comparing the #3500, Miran IA, and Charcoal Tube (C.T.) to a known concentration in an exposure chamber. The #3500 correlated well with the tank concentration and had excellent coefficient of variance.

II. Field Evaluations

Compound(s)	Evaluator	
a. Complex Mixtures Ketones and Chlorinated Hydrocarbons	Chemical Company (anonymous)	A field comparison was conducted between a 600 mg. charcoal tube and the #3500 in a complex mixture. Agreement is good for all cases except acetone, where it appears the #3500 samples are high. An explanation is given.
b. Benzene, Toluene Xylene in complex mixtures	Oil Company (anonymous)	A major oil company ran extensive side-by-side comparative studies of standard charcoal tubes and the #3500. Thirty samples were taken for Benzene, Toluene, and Xylene. These compounds were present together in a complex mixture of hydrocarbons.
c. Benzene, Toluene	Chemical Company (anonymous)	A U.S. chemical company ran side-by-side personal exposures with the #3500 and standard charcoal tubes. Benzene and Toluene were both present in the air.
d. 1, 1, 2 Trichloroethylene	3M Industrial Hygiene Department	Personal samples were run in a 3M plant. Samples were run for four hours and converted to TLV-TWA. Correlation was good between the two methods.
e. Acetone	Chemical Company (anonymous)	Three separate methods of measuring acetone in a field area sample were used. The 600 mg. tubes were used in series to be certain that loss through the tube was minimized. Comparability between methods is good.
f. Benzene	Steel Company	A U.S. Company ran side-by-side area samples between the #3500 and a standard charcoal tube. The range of concentrations found were from non-detectable to over 90 ppm, with an average of 7.89 ppm. A high degree of correlation exists between the 79 pairs of sample data.

III. Lab/Field Evaluations

Compound(s)	Evaluator	
a. Halothane Enflurane	U.S. Army Environmental Hygiene Agency	Laboratory and field testing was performed on the subject gases. Field data was taken in both unoccupied and occupied operating rooms.
b. Methyl Methacrylate	Chemical Company (anonymous)	Known quantities of MMA were generated in a laboratory chamber. Lab precision tests are shown, plus the side-by-side comparison of standard charcoal tube vs. the #3500 in personal field samples.