

THE LOS ALAMOS INCINERATOR

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The Los Alamos incinerator has been discussed at Air Cleaning Seminars but the progress during the past year justifies its discussion again. Last Fall tests of combustion efficiency were made by Richard Corey and his associates of the Bureau of Mines and recommendations were made for changes to improve this efficiency. After making most of the changes, good combustion efficiency was obtained. Limited testing of the air cleaning system at the same time indicated that its performance was generally as designed.

After a winter shut down, the whole unit was overhauled in the Spring. After noting the bad condition of the fiberglass filters, it was decided not to replace them during the following test period. A series of test runs were made on the whole system during the summer using uncontaminated trash to which measured amounts of radio-barium-lanthanum had been added. Considerable difficulty had been experienced previously in sampling because of the high temperature and water content of the gases. Sampling of the hot gases was accomplished using two large impingers in series immersed in an ice bath. The water from the impingers was evaporated, plated and beta activity counted. For sampling at the outlet stack a water separator and reheater followed by a glass paper filter was used. The paper was counted directly. The water from the separator was evaporated, plated and counted but was found to contain very little activity. A water content of approximately 1 ml/cu.ft. of stack air was found. Efficiencies on a radioactive basis were as follows:

	<u>Average</u>	<u>Maximum</u>
Cyclone (dry)	70 ³ / ₂	94 ³ / ₂
Cyclone (wet)	82	89
Venturi Scrubber	94	97
Overall (Cyclone & Scrubber)	97	99.8

The average percentage of the radioactivity charged into the incinerator which reached the stack was approximately 0.3% or a decontamination factor of 300. The above figures for the wet cyclone were obtained using a spray system which had been installed for cleaning down the cyclone walls.

Temperatures during the runs were as follows:

Incinerator outlet	1200 °F
Spray Cooler outlet	540 °F
Separator outlet	125 °F
Stack	90 °F

These temperatures were unaffected by the addition of water in the cyclone.

As a result of experience with the incinerator it seemed likely that difficulty would be experienced in keeping down contamination during charging and ash removal. After a visit to Argonne National Laboratory, the following changes were recommended and are now being completed:

1. Continuous instead of batch charging
2. Collection of ashes in a sealed drum instead of pumping into a tank with water
3. Provision for by-passing the glass filters during normal runs and quickly changing to filtration if necessary
4. Installation of a medium pressure water spray system in the inlet of the cyclone

With these changes it should be possible to obtain a decontamination factor of 300 to 500 which is sufficient for the type of combustible now being buried.