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THE DIRECTOR'S DIGEST

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EQUIPMENT AND TECHNIQUES DEVELOPED FOR A DYNAMIC SENSORY METHOD FOR ODORS

IIT Research Institute, under contract with FPRF, has been evaluating various systems for controlling odors in rendering plants (see Director's Digest, No. 91, January, 1972). During this investigation it became apparent that no simple, dependable technique was available for the sensory measurement of odor in the field. Also, pending regulations from EPA on rendering odors will probably specify the ASTM method as the field test compliance method. Many odor experts feel that this method is cumbersome and of questionable reliability and reproducibility.

Consequently, Dr. Andrew Dravnieks of IITRI, with the cooperation of Mr. William Prokop, National Renderers Association, has designed, constructed and tested a dynamic dilution olfactometer for the determination of odor levels in rendering plant exhausts. The results from the investigation have been presented in a recent report and excerpts from the report are presented below.

"The evaluation principles utilized were those in common use in the sensory quality control in industry: use of forced choice triangle method in the sample presentation (two blanks and one diluted effluent), double-blind sample presentation (neither the panelist nor the panel leader knows the correct choice), and elimination of positional, numerical, or other sample designation clues. A dynamic dilution triangle olfactometer with push-button signalling of the panelist choices was constructed for implementing the above principles. Effluent sampling, storage and delivery to the olfactometer was accomplished by a combination of peristaltic pump, utilizing a disposable tubing element, with a generally available thick-wall collapsible polyethylene 5 gallon container.

"The dynamically diluted effluents were presented in an ascending concentration order, increasing the concentration by a factor of 3 per step, with three concentration steps available on a continuous stand-by basis during the evaluation. The device permitted covering the odor unit range from 60 to 70,000; easy in-field changes can extend this to 30 to 500,000 units. Evaluation of one sample was routinely completed by a panel of 9 within less than 15 minutes.

"On the average, the dynamic triangle method gave slightly higher (7 percent) odor value than the syringe dilution test when applied to rendering effluents and some single odorant vapors. In the sample containers used, the rendering effluent samples, and diluted hydrogen sulfide and valeraldehyde vapor samples, could be stored without statistically significant change in the odor level for at least 48 hours."

It is expected that further testing will confirm the superiority of this dynamic sensory technique over the ASTM syringe dilution method. Further, it is hoped that regulatory officials will accept the technique as an alternative to the ASTM method for compliance testing.