

SUMMARY

Small, lightweight devices for measuring pulp mill gases are commercially available. Many have been evaluated by research teams in the laboratory or pulp mill. This is a review of such evaluations done within the past eight years.

Probably the most popular device for measuring gaseous contaminants in the workplace is the detector tube. Although it is simple, rapid, and convenient, its limitations should be understood, or results may be misleading. Most tubes are not specific, and may give readings which are too high (positive bias) or too low (negative bias). Accuracy is on the order of plus or minus 25% of the true value.

Passive dosimeters provide a time-weighted average exposure measurement. These convenient badge-type devices are clipped to the worker's clothing, and do not interfere with his or her activity. They are light-weight, small, and may be available for both short-term (fifteen minutes) and full-shift monitoring. Some types are provided with colour charts to match to the colour of the badge. Such visual judgement is inexact, and this method can only be considered semi-quantitative. Interference from other gases may be a problem. These devices also can be expected to achieve plus or minus 25% accuracy at the exposure limit.

Personal monitors continuously display the concentration of the gas in real time, and are usually fitted with an alarm. They may have data recording and processing abilities. Real-time display provides information unobtainable by any other method; for example, the fluctuation of gas concentration over time. This can be a very useful tool for educating workers and managers about work procedures and exposures.

However, the personal monitors reviewed in this study could not meet standard accuracy criteria, and required a strict calibration and testing program. In the hydrogen sulphide monitors, positive interferences from methyl mercaptan, and in some cases from sulphur dioxide, dimethyl sulphide and dimethyl disulphide caused inaccurate measurement. In the chlorine monitors, positive interference from chlorine dioxide and negative interferences from sulphur gases caused inaccuracy.

In spite of their high cost and complexity, direct-reading real-time monitors will continue to be developed, marketed and used. Their speed and the important information they provide make them attractive. Operators should be well trained in their testing, calibration and interferences, so that data obtained may be interpreted correctly.