



INHALATION ANESTHESIA SYSTEMS

HONEST ANSWERS FROM KNOWLEDGEABLE PEOPLE

## **Waste Gas Monitoring**

Halogenated hydrocarbons, including Desflurane, Sevoflurane, Isoflurane, Halothane, and Methoxyflurane are subject to NIOSH's Recommended Exposure Limits (REL)'s. The REL for these gases is 2 parts per million (PPM). This limit is based on a 1978 NIOSH study examining the effects of prolonged and repeated exposure to N<sub>2</sub>O and Halothane. Although no similar study has been done with more current agents, we must still comply with the standard of 2 PPM.

### **Testing Methods**

OSHA enforces the NIOSH recommendation without outlining any specific method for monitoring these levels. OSHA inspectors use canisters to collect an air sample and send the sample back to a laboratory for analysis. Safety assessment personnel at some larger facilities are using expensive real-time monitors. Analytical chemical laboratories, which issue and analyze badges, use a time-weighted average or other method of analysis to determine exposure. AAALAC's site inspection committee has requested proof of compliance. Without a specific guideline from OSHA, some type of monitoring is always better than none. It has been our experience that OSHA has been willing to accept all of these methods.

### **Real-time Monitors**

Real-time monitors show exactly how many PPM's are being detected as the test is being conducted. While precise, the spiked readings tend to be higher than the time-weighted average from the badge readings. The monitor sensors can be placed directly at nosecones or induction chamber lids where readings will be higher than the exposure at the investigator's breathing area, many inches away. The expense of real-time monitors may make them cost-prohibitive.

### **Badge Analysis**

Badges are the monitoring method of choice for most facilities. The badge is clipped to the user's shirt collar where it adsorbs samples of the air near the breathing area. The badge is then sent to a laboratory for analysis and reporting.



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### **Frequency**

Monitoring via badges, air samples or real-time devices is not done daily or weekly. Most facilities opt to have one person in each procedure area wear a badge once every six months. You and your safety assessment committee may opt for more frequent monitoring if results exceed PEL's, procedure protocols change, if there is a change in personnel/equipment, or as needed.