

## 3M

### ORGANIC VAPOR MONITOR #3520

#### SAMPLING GUIDE

##### #3520 Sampling Information

The Organic Vapor Monitor #3520 is a diffusional sampling device with a backup section. The monitor consists of two layers of adsorbent media separated by a small space containing a placid air layer. For a specific contaminant, the secondary adsorbent in the backup section collects contaminant when the capacity of the primary adsorbent has been exceeded. The diffusional sampling capacity for the primary adsorbent can be defined as the weight adsorbed when the weight collection rate is no longer a linear function of the exposure. Although the diffusional capacity for the primary adsorbent may be reached during sampling, the primary adsorbent will continue to collect contaminant even though the weight collection rate deviates from the linear relationship.

The weight ( $W_p$ ) collected on the primary (top) adsorbent even though in excess of the defined diffusional capacity can be combined with the weight ( $W_s$ ) collected on the secondary (bottom) adsorbent to give an accurate determination of the time-weight-average concentration in the sampled environment. The sample validity can be determined by comparing the ratio of the weight ( $W_s$ ) collected by the secondary and the weight ( $W_p$ ) collected by the primary adsorbent. The ratio  $W_s/W_p$  must be equal to or less than 0.50.

##### A. Sampling Rate

The top section of the #3520 containing the primary adsorbent has the same geometric dimension as the 3M Organic Vapor Monitor #3500 and therefore the sampling rates are the same as those tabulated in the Sampling Guide for the Organic Vapor Monitor #3500 (coded R-3556). The sampling rates for the Organic Vapor Monitor #3520 also have an accuracy of  $\pm 5\%$ .

##### B. Capacity

Because of the backup section, the effective sampling capacity of the Organic Vapor Monitor #3520 is greater by a factor of four over those tabulated in the Analysis Guide for the Organic Vapor Monitor #3500. (code R-35AG)

When sampling environments containing contaminant mixture of environment with high relative humidity, it is difficult to accurately define the diffusional sampling capacity. Therefore, under these conditions, the weight ( $W_s$ ) collected by the secondary adsorbent of the backup section can be compared with the weight ( $W_p$ ) collected by the primary adsorbent to determine sample validity.

When sampling mixtures, the weight ratio  $W_s/W_p$  can be determined for each contaminant. The sample is valid for each contaminant whose ratio is equal to or less than 0.50.

### C. Length of Sampling Period

When sampling for Organic contaminants, full workshift sampling periods are recommended as the most comprehensive measure of worker exposure. When using the Organic Vapor Monitor #3520, the sampling guide for the Organic Vapor Monitor #3500 should be consulted. For those compounds where the recommended length of the sampling period for the Organic Vapor Monitor #3500 is less than a full workshift, the length of the sampling period can be increased by a factor of four when using the Organic Vapor Monitor #3520 because it has four times more effective contaminant capacity. Because of this increased effective capacity of the Organic Vapor Monitor #3520, sampling periods longer than a full workshift are possible, but the preferred recommendation is for full workshift sampling periods.

In the sampling guide for the Organic Vapor Monitor #3500, there are a number of compounds where even at relative humidities  $< 70\%$ , sampling was not recommended (NR) at high concentrations with the Organic Vapor Monitor #3500. Now with the Organic Vapor Monitor #3520, these compounds can be sampled. The following sampling guide for the Organic Vapor Monitor #3520 gives the recommended sampling period for these compounds.

| COMPOUND                                   | RECOMMENDED SAMPLING PERIOD<br>(hrs.) |             |              |             |
|--------------------------------------------|---------------------------------------|-------------|--------------|-------------|
|                                            | RH $< 70\%$                           |             | RH $> 70\%$  |             |
|                                            | .1-.5<br>PEL                          | .5-3<br>PEL | .1-.5<br>PEL | .5-3<br>PEL |
| Butadiene                                  | 1.6                                   | .3          | 1.6          | .3          |
| Ethyl Ether                                | 1.2                                   | .2          | 1.2          | .2          |
| Methylal (Dimethoxymethane)                | 1.2                                   | .2          | 1.2          | .2          |
| Methyl Formate                             | 2.8                                   | .5          | 2.8          | .5          |
| 1,1,2 Trichloro 1,2,2 tri-<br>fluoroethane | 2.0                                   | .4          | 2.0          | .4          |

### 3M Organic Vapor Monitor Selection Chart

| Sampling Parameters                                                                                            | Monitor Recommendation |                |
|----------------------------------------------------------------------------------------------------------------|------------------------|----------------|
|                                                                                                                | #3500                  | #3520          |
| <u>Relative Humidity</u>                                                                                       |                        |                |
| High (>70%)                                                                                                    | x <sup>1</sup>         | x              |
| Low (<70%)                                                                                                     | x                      | x              |
| <u>Short Term Exposures</u>                                                                                    |                        |                |
| STELs                                                                                                          | x <sup>2</sup>         |                |
| <u>High Vapor Pressure Compounds</u>                                                                           |                        |                |
| Including: acrylonitrile<br>pentane<br>vinyl chloride<br>acetone<br>methylene chloride<br>butadiene<br>ethanol |                        | x <sup>3</sup> |
| <u>Contaminant Concentrations</u>                                                                              |                        |                |
| High (over 3x PEL)                                                                                             |                        | x              |
| Moderate <sup>4</sup> (.5-3x PEL)                                                                              | x                      | x              |
| Low <sup>4</sup> (up to .5 PEL)                                                                                | x                      | x              |
| Unknown                                                                                                        |                        | x              |

<sup>1</sup> Refer to #3500 Sampling Guide (R-35SG) for maximum time for use at high humidity

<sup>2</sup> Refer to #3500 Sampling Guide (R-35SG) for those compounds best suited for STEL

<sup>3</sup> See reverse side for the specific sampling recommendations for these compounds

<sup>4</sup> Refer to Sampling Guide (R-35SG) for specific compound recommendations