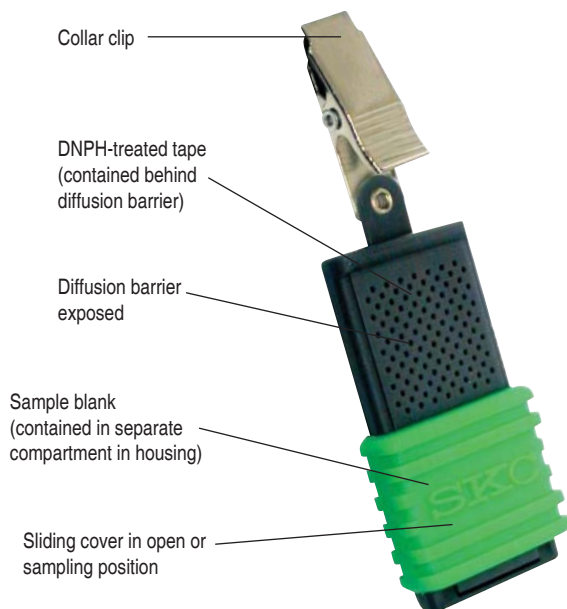


# UMEX<sup>100</sup> Passive Sampler

## Formaldehyde Sampling

UMEX<sup>100</sup> Passive Sampler for formaldehyde was developed in collaboration with the National Institute of Working Life in Umea, Sweden. Constructed of tough polypropylene, the single-use UMEX<sup>100</sup> contains tape treated with 2,4-dinitrophenylhydrazine (DNPH) for reliable collection of formaldehyde. For convenience and quality control assurance against contamination, each sampler incorporates a “blank” section in addition to the active sampling section so there is no need to send extra samplers to a laboratory. To sample, remove the sampler from the pouch, record sampling information, slide cover to “on” position, and clip to a worker’s collar or appropriate sampling location. When sampling is complete, slide cover to “off” position, place the sampler back in the original pouch immediately, and seal. Send the sampler to an accredited laboratory for analysis by high-performance liquid chromatography (HPLC) with UV detection.

For sampling rates on other aldehydes, see the UMEX<sup>100</sup> Sampling Rates for Other Aldehydes table on reverse side.



UMEX<sup>100</sup> Sampler with sliding cover in sampling position

- Accuracy exceeds OSHA standards
- Highly selective 2,4-DNPH chemistry; easy analysis
- Accurate and reliable for formaldehyde collection
  - Sample integrity is assured
  - Validated by OSHA and Swedish Institute
- Documented formaldehyde uptake rates for 15-minute to 24-hour and 7-day samples
  - Sampling rates available for other aldehydes
- Samples low ppb levels of formaldehyde
- Economical and easy to use
  - No pump or training required
  - Low-cost sampler
  - Sample medium and blank section in one unit
- Conforms to EU ISO 16000-4-2004
- Meets specifications of OSHA Method 1007<sup>‡</sup>
- Referenced in EPA IP-6C
- Highly sensitive and specific analysis method
- Small and unobtrusive
- Simple-to-use “on/off” sliding cover
- Safe
  - No glass or chemical liquids in the sampler
- 28.6 ml/min uptake rate enhances sensitivity for 15-minute, 8-hour, and 24-hour sampling
- Free media blank included

<sup>‡</sup> Note: If sampling in an atmosphere containing formalin, see [www.skinc.com/instructions/1795.pdf](http://www.skinc.com/instructions/1795.pdf) for field study information.

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# UMEX<sup>100</sup> Passive Sampler

## Formaldehyde Sampling

### Performance Profile

<b>Sampling Rate for Formaldehyde:</b>	<ul style="list-style-type: none"> <li>• 28.6 ml/min with an RSD of 7.6% at a wind velocity of 5 to 100 cm/sec for 15 min to 24 hrs</li> <li>• 20.4 ml/min at wind velocities &lt; 5 cm/sec for 1 to 7 days</li> </ul>
<b>Detection Principle:</b>	Formation of stable DNPH-hydrazone in the presence of formaldehyde
<b>Validation Range:</b>	0.06 to 3.0 ppm
<b>Lower Detection Limits:</b>	<ul style="list-style-type: none"> <li>• 15 min: 200 ppb (.24 mg/m<sup>3</sup>)</li> <li>• 8 hr: 5 ppb (.006 mg/m<sup>3</sup>)</li> <li>• 24 hr: 2 ppb (.002 mg/m<sup>3</sup>)</li> <li>• 7 days: 0.2 ppb (.0002 mg/m<sup>3</sup>)</li> </ul>
<b>Shelf-life:</b>	12 mos from date of manufacture at ≤ 39.2 F (4 C)
<b>Capacity:</b>	29 µg/sample
<b>Analysis:</b>	Solvent extraction and analysis by HPLC (high-performance liquid chromatography) with UV detection
<b>Accuracy:</b>	± 25%, exceeds OSHA requirements
<b>Storage:</b>	<p><i>Before use:</i> ≤ 39.2 F (4 C)</p> <p><i>After use:</i> ≤ 39.2 F (4 C) and analyze within 3 weeks</p>
<b>Temperature Effects:</b>	No effect on sampling rate between 10 and 30 C
<b>Humidity Effects:</b>	No effect from 10 to 80% relative humidity; do not use below 10% RH
<b>Wind Effects:</b>	No effect from 5 to 100 cm/sec
<b>Interferences:<sup>†</sup></b>	<ul style="list-style-type: none"> <li>• Large amounts of carbonyl compounds may reduce the uptake of formaldehyde</li> <li>• Use in ozone levels &lt; 0.5 ppm</li> </ul>
<b>Dimensions:</b>	3.4 x 1.1 x .35 in (8.6 x 2.8 x .89 cm)
<b>Weight:</b>	0.38 oz (10.8 gm)

### UMEX<sup>200</sup> for Sulfur Dioxide and/or Nitrogen Dioxide

UMEX<sup>200</sup> uses tape treated with triethanolamine (TEA) for the passive collection and analysis of sulfur dioxide and/or nitrogen dioxide. Analysis is by ion chromatography (IC) with conductivity detection. **Cat. No. 500-200**

### UMEX<sup>300</sup> for Ammonia

UMEX<sup>300</sup> uses tape treated with sulfuric acid for the passive collection and analysis of ammonia. Analysis is by solvent extraction and ion chromatography (IC) with conductivity detection for the ammonium ion. **Cat. No. 500-300**

### UMEX<sup>100</sup> Sampling Rates for Other Aldehydes

Compound	Sampling Rate (ml/min)
Formaldehyde (full validation)	<b>28.6</b> (velocity 5 to 100 cm/sec, 15 min to 24 hrs) <b>20.4</b> (velocity < 5 cm/sec, 1 to 7 days)
Acetaldehyde	22.8 <sup>∞</sup>
Benzaldehyde	13.5 <sup>∞</sup>
Butyraldehyde	15.8 <sup>∞</sup>
Crotonaldehyde	9.71 <sup>∞</sup>
Glutaraldehyde	14.0 <sup>∞</sup>
Hexanaldehyde (hexanal)	9.66 <sup>∞</sup>
Isovaleraldehyde	15.5 <sup>∞</sup>
Propionaldehyde (propanal)	14.0 <sup>∞</sup>
Chloroacetaldehyde	19.4 <sup>**</sup>
Decylaldehyde	10.4 <sup>**</sup>
Heptanaldehyde	12.8 <sup>**</sup>
Nonanaldehyde	11.6 <sup>**</sup>
o-Phthaldehyde	12.83 <sup>**</sup>
o-Tolualdehyde	12.7 <sup>**</sup>
Valeraldehyde	15.4 <sup>**</sup>

<sup>∞</sup> Partial validation; see *Passive Sampling Guide* at <http://www.skinc.com/catalog/passive-guide.php>.

<sup>\*\*</sup> Calculated sampling rate; see online *Passive Sampling Guide* at [www.skinc.com](http://www.skinc.com)

### References

Levin, J.O. and Lindahl, R., "Diffusive Air Sampling of Reactive Compounds - A Review," *Analyst*, Vol. 119, January 1994, pp. 79-83

Levin, J.O., Lindahl, R., and Anderson, K., "High-performance Liquid Chromatographic Determination of Formaldehyde in Air in the ppb and ppm Range Using Diffusive Sampling and Hydrazone Formation," *Nat. Inst. of Occ. Health, Research Dept. in Umea, Analytical Chem. Div., P.B. 6104, S-90006 Umea, Sweden Environ. Tech. Letter 9, 1988, pp. 1423-1430*

OSHA Method 1007 Formaldehyde (Diffusive Samplers), May 2005

Levin, J.O., Lindahl, R., and Anderson, K., "A Passive Sampler for Formaldehyde in Air Using 2,4-Dinitrophenylhydrazine-coated Glass Fiber Filters," *Environ. Sci. and Tech.*, Vol. 20, No. 12, 1986, pp. 1273-1276

### Ordering Information

Description	Cat. No.
<b>UMEX<sup>100</sup> Passive Sampler for Formaldehyde<sup>†</sup> and Other Aldehydes,<sup>†‡</sup> individually packaged in aluminized pouch, pk/10</b>	<b>500-100</b>
<b>Treated Tape, for QC purposes only, pk/50</b>	<b>P20084</b>
<b>Stand for Area Sampling</b>	<b>690-302</b>

<sup>†</sup> Limited shelf-life; storage at ≤ 39.2 F (4 C) required.

<sup>‡</sup> **Note:** If sampling in an atmosphere containing formalin, see [www.skinc.com/instructions/1795.pdf](http://www.skinc.com/instructions/1795.pdf) for field study information.

<sup>#</sup> Designed for single use only. Do not reuse UME<sup>x</sup> samplers.

### SKC Limited Warranty and Return Policy

SKC products are subject to the SKC Limited Warranty and Return Policy, which provides SKC's sole liability and the buyer's exclusive remedy. To view the complete SKC Limited Warranty and Return Policy, go to <http://www.skinc.com/warranty>.

