

# IOM Sampler

A Gold Standard for Personal Inhalable Particulate Sampling



## IOM Sampler

Only the authentic IOM Sampler developed by the Institute of Occupational Medicine (IOM) in Scotland has been tested by the Health and Safety Laboratory, Health and Safety Executive (HSE) in the UK and verified to meet the ISO/CEN convention (ISO 7708).\* The IOM Personal Inhalable Sampler is a sampling head that houses a reusable 25-mm filter cassette with specified filter for the collection of inhalable airborne particles. When attached to a personal sampling pump operating at 2 L/min and clipped near a worker's breathing zone, the IOM effectively traps particles up to 100  $\mu\text{m}$  in aerodynamic diameter and **closely simulates how airborne workplace particles are inhaled through the nose and mouth**. The plastic cassette with filter is weighed as a single unit before and after sampling for gravimetric analysis. A stainless steel IOM cassette can be used for chemical analyses and bioaerosol sampling.

## IOM Accessories

- **Calibration adapter**  
Easy to use; simple and accurate calibration
- **Cassette**  
Conductive plastic or stainless steel
- **Transport clip and cover**  
Protect loaded filter cassette without IOM body during transportation



## IOM MultiDust Sampling

Using the IOM Inhalable Sampler with a MultiDust foam disc and filter transforms the IOM into a versatile personal dust sampler, able to separate and collect inhalable and respirable fractions simultaneously. By inserting a MultiDust polyurethane foam (PUF) disc of specific porosity into the IOM cassette inlet, **respirable** particles can be collected on the filter at the back of the cassette. The sample collected on the foam can be weighed with the filter to determine the **inhalable** fraction. Analysis is gravimetric.

\* Reference: Kenny, et al., "A Collaborative European Study of Personal Inhalable Aerosol Sampler Performance," *Ann. Occup. Hyg.*, Vol. 4, No. 2, 1997, pp. 135-153

## ► Meets U.S. and international standards

- ACGIH sampling criteria for inhalable particulate
- ISO®/CEN health-related fractions of bioaerosols
- Preferred sampler for HSE Method MDHS 14/4
- NIOSH Method 5700 for particulate formaldehyde
- Australian standard for inhalable particulate
- Complies with MDHS 25/3 for organic isocyanates (stainless steel model only)
- Complies with MDHS 6/3 for lead (with accessory head)
- OSHA-equivalent method for particulates not otherwise regulated (PNOR)†

## ► Economical and reusable

## ► Small and lightweight

- Plastic model weighs less than 2 ounces (55 grams)

## ► Efficient particulate sampling up to 100 $\mu\text{m}$

## ► Maintains sample integrity

- Removable 25-mm cassette system eliminates filter handling
- Cassette and filter are weighed as a single unit to include all collected particles in analysis

## ► Stainless steel cassette available for chemical analysis

- Autoclavable for bioaerosol sampling

‡ Reference: OSHA letter November 8, 2011; contact SKC for a copy

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### Performance Profile

<b>Flow Rate:</b>	2 L/min*
<b>50% Cut-point:</b>	100 µm at 2 L/min inhalable fraction 4.0 µm at 2 L/min respirable (with MultiDust)
<b>Construction:</b>	Molded conductive plastic (polypropylene) or stainless steel
<b>Maximum Operating Temperature:</b>	<b>Plastic IOM and cassette:</b> 212 F (100 C) with no pressure <sup>†</sup> <b>Stainless steel IOM and cassette:</b> 392 F (200 C) - suitable for autoclaving and solvent washing
<b>Filters:</b>	25-mm membrane or fibrous filter
<b>Weight:</b> (plastic model with cassette)	< 2 oz (55 gm)
<b>Analysis:</b>	Gravimetric or chemical (stainless steel model)
<b>Tubing:</b>	1/4-in ID

\* For sampling at higher flow rates, see Technical Note 1977 at [www.skinc.com/catalog/pdf/instructions/1977.pdf](http://www.skinc.com/catalog/pdf/instructions/1977.pdf)

† The plastic IOM is not suitable for autoclaving or ethylene oxide sterilization.

### References

Mark, D. and Vincent, J. H., "A New Personal Sampler for Airborne Total Dust in Workplaces," Ann. Occup. Hyg. Vol. 30, 1986, pp. 89-102

ACGIH Technical Committee on Air Sampling Procedures: Particle Size-selective Sampling in the Workplace, ACGIH, Cincinnati, Ohio, 1984

Kenny, L.C., Bowry, A., Crook, B., and Stancliffe, J.D., "Field Testing of a Personal Size-selective Bioaerosol Sampler," American Occupational Hygiene, Vol. 43, No. 6, 1999, pp. 393-404

Kenny, L.C., Chung, K.Y.K., Dilworth, M., Hammond, C., Jones, J. Wynn, Shreeve, Z., and Winton, J., "Applications of Low-cost Dual-fraction Dust Samplers," Ann. Occup. Hyg., Vol. 45, No. 1, 2001, pp. 35-42

Wang, C. et al., Field Evaluation of Personal Sampling Methods for Multiple Bioaerosols at doi: 10.1371/journal.pone.0120308.

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### Size-selective Bioaerosol Sampling

Previously used only for sampling chemical particles, the IOM Sampler with MultiDust foam disc has been tested by the HSE's Health and Safety Laboratory (UK), which has determined it to be an effective size-selective sampler for bioaerosols.

It has been shown that the IOM Sampler, loaded with a user-sterilized polycarbonate filter\*\* and MultiDust polyurethane foam disc,\*\* is not only an efficient collector of inhalable and respirable fractions of bioaerosols, but it also better maintains survivability of microorganisms when compared to filter-only sampling. This has been attributed to the MultiDust foam's large surface area and open cell structure, which diffuses airflow to reduce microbial dehydration. Analysis is by growth culture or microscopy.

A study, using culture assay, epifluorescence microscopy, and microscopy analyses, has determined that the IOM Sampler loaded with a polycarbonate filter provides efficient sampling for personal exposure assessment of multiple bioaerosols, particularly bacteria.

\*\* The MultiDust foam disc must be washed and sterilized with UV light and the polycarbonate filter autoclaved before sampling. For optimum results, handle all components of the sampler and media with sterile gloves and forceps before and after sampling.

### Ordering Information

IOM Samplers, use with filter, select from below	Cat. No.
<b>IOM Sampler and cassette</b> , <sup>‡</sup> in conductive plastic, with transport clip and cover	<b>225-70A</b>
<b>IOM Sampler and cassette</b> , <sup>‡</sup> in stainless steel, with transport clip and cover	<b>225-76A</b>
<b>IOM Sampler</b> , <sup>‡</sup> in conductive plastic, with stainless steel cassette, transport clip, and cover	<b>225-79A</b>
<b>Accessories</b>	
<b>Cassette assembly</b> , in conductive plastic, with transport clip and cover	<b>225-71A</b>
<b>Cassette assembly</b> , in stainless steel, with transport clip and cover	<b>225-75A</b>
<b>Transport Clip and Cover</b> for cassette	<b>225-72A</b>
<b>IOM Calibration Adapter</b>	<b>391-01</b>
<b>Single Hole Lead Head</b> , for sampling lead to MDHS 6	<b>225-52</b>
<b>Seven Hole Head</b>	<b>225-50</b>
<b>Asbestos Head</b> , 25-mm cowled aluminum sampler designed for use with a gridded filter as per HSG (UK) 248 for asbestos fibers	<b>225-54A</b>

MultiDust Foam Discs, use with filters, select from below		
<b>MultiDust Foam Discs for Respirable and Inhalable PM</b>	pk/10	<b>225-772</b>
	pk/50	<b>225-772-50</b>

25-mm Filters, each sample requires its own filter	
<b>PVC</b> , 5.0 µm, pk/100	<b>225-5-25</b>
<b>Glass Fiber</b> , 1.0 µm, pk/500	<b>225-702</b>
<b>MCE</b> , 0.8 µm, pk/100	<b>225-1930</b>
<b>Polycarbonate</b> , 0.8 µm, pk/100	<b>225-1601</b>
<b>Gelatin</b> , sterilized, pk/50	<b>225-9551</b>

‡ A 25-mm filter is required for sampling with the IOM; see above.

