

IOM Sampler

A Gold Standard for Personal Inhalable Particulate Sampling



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The IOM Sampler, developed by J. H. Vincent and D. Mark at the Institute of Occupational Medicine (IOM) in Scotland, meets the ACGIH sampling criteria for inhalable particulate mass. 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 μm in aerodynamic diameter and closely simulates how airborne workplace particles are inhaled through the nose and mouth. Because both the cassette and the filter are weighed as a single unit before and after sampling, all particles collected (even larger ones) are included in the analysis. The cassette can be cleaned, reloaded with a new filter, and reused. The IOM is one of the most effective inhalable particulate samplers available.

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 sample inhalable and respirable fractions individually or simultaneously. By inserting a MultiDust polyurethane foam (PUF) disc of specific porosity into the inlet of the IOM cassette, 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 for determination of the inhalable fraction. Analysis is gravimetric. *Only IOMs manufactured after June 2000 are suitable for MultiDust sampling.*

► 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 μm

► 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

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

[†] 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.
IOM Sampler and cassette , [‡] in conductive plastic, with transport clip and cover	225-70A
IOM Sampler and cassette , [‡] in stainless steel, with transport clip and cover	225-76A
IOM Sampler , [‡] in conductive plastic, with stainless steel cassette, transport clip, and cover	225-79A
Accessories	
Cassette assembly , in conductive plastic, with transport clip and cover	225-71A
Cassette assembly , in stainless steel, with transport clip and cover	225-75A
Transport Clip and Cover for cassette	225-72A
IOM Calibration Adapter	391-01
Single Hole Lead Head , for sampling lead to MDHS 6	225-52
Seven Hole Head	225-50
Asbestos Head , 25-mm cowled aluminum sampler designed for use with a gridded filter as per HSG (UK) 248 for asbestos fibers	225-54A

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

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

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

