

C Characteristics of Air Sampling

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Table C.1 Methods to demonstrate the representativeness of air sampling

Method	Include	Comparison	Acceptance criteria
Comparison with lapel samplers	Workers whose annual intakes must be monitored under 10 CFR 20.1502(b) because intakes are likely to exceed 10% of an ALI and whose dose of record will be based primarily on air sampling.	Compare intakes measured by air sampling with intakes measured by lapel samplers for at least 1 week for continuous operations or for several operations for repeated short-duration operations.	The ratio of the intakes calculated from air sampling divided by the intakes calculated from lapel samplers should exceed 0.7 when averaged for all workers in the comparison. The ratio for each individual worker should exceed 0.5. (The values of 0.7 and 0.5 were selected so that the accuracy of intakes based on air sampling would be compatible with the accuracy expected of external radiation dosimeters.)
Comparison with bioassay results	Workers whose annual intakes must be monitored under 10 CFR 20.1502(b) because intakes are likely to exceed 10% of an ALI and whose dose of record will be based primarily on air sampling.	Compare the sum of the intakes determined from air sampling with the sum of the intakes calculated from those bioassay measurements.	The ratio of the sum of the intakes calculated from air sampling divided by the sum of the intakes calculated from bioassay measurements should exceed 0.7 when averaged for all workers included in the comparison. The ratio for each individual worker should exceed 0.5 for each individual worker.
Comparison with multiple samplers	Work locations at which airborne concentrations are likely to exceed 0.3 DAC and that are generally occupied by workers whose	Use multiple samplers to take measurements at four more locations around the worker's head.	The concentration determined by the fixed-head sampler divided by the concentration averaged for all the multiple heads should exceed 0.7 for the work station.
Comparison with quantitative airflow measurements	Work stations at which the average annual airborne concentrations are likely to exceed 0.1 DAC	Release a tracer material near the source release point. Measure its concentration with the fixed-head sampler and with another sampler placed close to the worker's head.	The concentration measured by fixed-head sampler divided by the concentration by the sampler placed close to the worker's head should exceed 0.7.

¹U.S. Nuclear Regulatory Commission, Regulatory Guide 8.25, Air Sampling in the Workplace, Revision 1, June 1992.

Table C.2 Collection efficiency and flow resistance of selected air sampling filter media¹

Filter class	Filter designation	Supplier	Collection efficiency, percent, for retaining 0.3 µm DOP			Flow resistance, mmHg				
			10.7 Velocity cm/sec	26.7 Velocity cm/sec	53 Velocity cm/sec	35 Velocity cm/sec	53 Velocity cm/sec	71 Velocity cm/sec		
Cellulose	Whatman 41	W&R Beleton, Ltd., England	64	72	84	96	24	36	48	72
	SS 589/1	Scheicher & Schuell, Germany	46	56	66	80	18	27	37	56
	TFA-41	The Staplex Co., USA	62	74	86	96	23	40	48	61
Cellulose-Asbestos	S-P Rose	Etalissements Schneider-Poelman, France	99.18	99.28	99.52	99.75	38	57	75	112
	HIV-70	Hollingsworth & Vose, USA	99.6	99.2	99.2	99.6	44	64	67	127
Glass-Fiber	MSA 1106 B	Mine Safety Appliance Co., USA	99.998	99.992	99.952	99.978	20	30	40	61
	Gelman E	Gelman Instrument Co., USA	99.974	99.964	99.970	99.986	19	28	38	57
Membrane	Milipore AA (Pore size 0.8 µm)	Milipore Filter Corp. USA	99.992	99.995	99.990	—	96	142	195	285
	Gelman AM-1 (Pore size 5 µm)	Gelman Instrument Co., USA	88	88	92	95	56	64	117	190

¹Standard Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities, ANSI N13.1, American National Standards Institute, Inc. 1989.

Table C.3 Number of points for duct diameter^a

Duct diameter in inches	Minimum number of points
2 - 16	1
8 - 12	2
14 - 18	3
20 - 28	4
30 - 48	5
50 and larger	6

^aStandard Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities, ANSI N13.1, American National Standards Institute, Inc. 1969.

Table C.4 Number of points for duct area^a

Duct area	Suggested number of points
Less than 0.5 sq. ft.	1
1 - 2 sq. ft.	4
2 - 25 sq. ft.	6 - 12
> 25 sq. ft.	20

^aStandard Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities, ANSI N13.1, American National Standards Institute, Inc. 1969.