ANALYT MESSTECHNIK



TECHNICAL NOTE

SKC ULTRA Passive Sampler

Sampling rates for 87 volatile organic compounds when the air at the sampler moves slower than 5 cm/s, as in much environmental sampling.

AMTC-TN-0008

About this note

The SKC ULTRA Passive Sampler collects volatile organic compounds by diffusion, without a pump. Its sampling rate depends on how fast the air moves past it. This technical note gives the sampling rates for 87 compounds when the air at the sampler moves slower than 5 cm/s, the case in much environmental sampling.

Using the low-velocity rates (p. 4) explains when these rates apply and how to calculate a concentration with them. Sampling rates A–Z (p. 5) is the table itself.

For air that moves faster, and for the choice of sampler and analysis, use the ULTRA reference guide (Analyt-MTC document AMTC-RF-0005). How to deploy, close, store and ship the sampler is described in the operating instructions (AMTC-IN-0050).

How this note marks information

NOTICE

Practices not related to personal injury — damage to the product, the process or the sample.

Note
Information that helps understanding; never a hazard.

Document information

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Manufacturer	SKC Inc.

Revision history

Rev.	Date	Change
2	October 2026	Quality programme: new document type, number and identity pages.
1	October 2026	First issue.

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CHAPTER 1

Using the low-velocity rates

A passive sampler takes up a compound only as fast as fresh air reaches its face. Where the air is almost still, it takes up less per minute, so the calculation needs a lower sampling rate.

When these rates apply

Use the rates in this note when the air velocity at the sampler is below 5 cm/s. Environmental sampling often takes place in such still air. For faster air, use the standard sampling rates in the ULTRA reference guide AMTC-RF-0005.

The note gives one rate per compound and does not distinguish between the ULTRA sorbents. Which sampler suits a compound and which analysis the laboratory uses are given in AMTC-RF-0005.

NOTICE

A sample taken in still air but calculated with the standard rate comes out about 40 % too low. For toluene the standard rate (690-101, thermal desorption, AMTC-RF-0005) is 14.5 mL/min, the low-velocity rate 8.90 mL/min. When the air velocity at the sampler is below 5 cm/s, calculate with the low-velocity rate in this note.

From collected mass to concentration

Multiply the sampling rate *U* by the sample time *t* to get the equivalent air volume. The collected mass *m* divided by that volume is the average concentration:

$$C\ [\mu g/m^3] = 1000 \times m\ [ng] / (U\ [mL/min] \times t\ [min])$$

Example. Toluene, low velocity, 8.90 mL/min, sampled for 24 h (1440 min): the equivalent volume is 8.90 × 1440 = 12 816 mL. If the laboratory finds 100 ng, the concentration is 1000 × 100 / 12 816 = 7.8 µg/m³.

Reading the rate table

1. Find the compound. The table is alphabetical; prefixes such as n-, t-, cis-, trans-, alpha-, m-, o-, p- and position numbers (1,2-) are ignored in the sort. A compound known by several names is listed once, with the other names under it; each other name has a short "see" line at its own place.
2. Note the sampling rate in mL/min and give it to the laboratory with the start and stop times of the sample.
3. Check the **Validated** column. "yes" means the rate has been partially or fully validated; "–" means it has not.

Note

Two compounds are listed twice in the SKC's table, with different rates: n-butyl acetate (10.40 and 10.35 mL/min) and 4-ethyltoluene (3.95 and 8.34 mL/min). Both values are printed. Ask Analyt-MTC before you report a result for 4-ethyltoluene.

CHAPTER 2

Sampling rates A–Z

Sampling rate of the SKC ULTRA Passive Sampler at an air velocity below 5 cm/s. Validated: "yes" = partial or full validation, "–" = not validated (see Reading the rate table (p. 4)).

Compound	mL/min	Validated
Acetone	12.60	yes
Acrylonitrile	18.76	yes
t-Amyl methyl ether methyl tert-amyl ether	10.96	yes
Benzene	10.70	yes
Bromodichloromethane	8.57	–
Bromoform	9.43	–
1-Bromopropane	8.47	yes
1,3-Butadiene	10.41	–
2-Butanone methyl ethyl ketone, MEK	6.27	yes
n-Butyl acetate	10.40 / 10.35[a]	yes
Butyl acrylate	8.23	yes
t-Butyl ethyl ether ethyl tert-butyl ether	9.725	–
t-Butyl methyl ether methyl tert-butyl ether, MTBE	9.84	yes
p-tert-Butyltoluene 4-tert-butyltoluene	4.01	yes
Carbon tetrachloride	10.41	yes
3-Carene	6.83	yes
Chlorobenzene	5.98	yes
p-Chlorobenzotrifluoride OXSOL 100	7.30	yes
Chloroform	10.14	yes
3-Chlorostyrene	5.15	–
Cumene isopropyl benzene	8.97	yes
Cyclohexane	7.76	yes
Cyclohexanone	8.13	yes
n-Decane	4.96	–
DIBK: see Diisobutyl ketone		
Dibromochloromethane	7.58	–
1,2-Dibromoethane	9.06	–
1,2-Dichlorobenzene	10.70	yes
1,4-Dichlorobenzene	10.74	–
1,1-Dichloroethane	9.25	yes

Compound	mL/min	Validated
1,2-Dichloroethane ethylene dichloride	11.79	yes
cis-1,2-Dichloroethene	11.54	yes
trans-1,2-Dichloroethene	10.20	yes
1,1-Dichloroethylene	9.74	yes
1,2-Dichloroethylene isomer not stated	11.50	yes
Dichloromethane methylene chloride	10.29	yes
1,2-Dichloropropane propylene dichloride	10.44	yes
cis-1,3-Dichloropropene	6.74	yes
trans-1,3-Dichloropropene	6.62	yes
Diisobutyl ketone DIBK	6.34	yes
1,4-Dioxane	8.64	–
Ethanol ethyl alcohol	11.7	yes
Ethyl acetate	9.26	yes
Ethyl acrylate	7.61	yes
Ethyl benzene	9.02	yes
Ethylene dichloride: see 1,2-Dichloroethane		
Ethyl methacrylate	8.96	yes
Ethyl tert-butyl ether: see t-Butyl ethyl ether		
2-Ethyltoluene	6.59	–
3-Ethyltoluene	5.29	–
4-Ethyltoluene	3.95 / 8.34[b]	–
n-Heptane	9.38	yes
Hexafluorobenzene	7.77	–
n-Hexane	9.59	yes
2-Hexanone methyl butyl ketone, MBK	6.46	yes
Hexone: see Methyl isobutyl ketone		
Isopentane	8.41	–
Isopropanol isopropyl alcohol	10.17	yes
Isopropyl acetate	9.57	–
Isopropyl benzene: see Cumene		

Compound	mL/min	Validated
Limonene	5.55	–
MBK: see 2-Hexanone		
MEK: see 2-Butanone		
Methyl acrylate	13.01	yes
Methyl butyl ketone: see 2-Hexanone		
Methyl chloroform: see 1,1,1-Trichloroethane		
Methyl cyclohexane	8.89	yes
Methyl cyclohexanol	4.97	yes
Methylene chloride: see Dichloromethane		
Methyl ethyl ketone: see 2-Butanone		
Methyl isobutyl ketone MIBK, hexone	7.29	yes
Methyl methacrylate MMA	9.52	–
Methyl tert-amyl ether: see t-Amyl methyl ether		
Methyl tert-butyl ether: see t-Butyl methyl ether		
MIBK: see Methyl isobutyl ketone		
MMA: see Methyl methacrylate		
Monochlorotoluene OXSOL 10	6.22	yes
MTBE: see t-Butyl methyl ether		
Naphthalene	2.71	–
Nonane	6.55	yes
Octafluorotoluene	9.32	–
n-Octane	8.58	yes
OXSOL 10: see Monochlorotoluene		
OXSOL 100: see p-Chlorobenzotrifluoride		
OXSOL 2000: see Trifluoromethylbenzene		

Compound	mL/min	Validated
PCE: see Tetrachloroethylene		
n-Pentane	10.71	yes
Perchloroethylene: see Tetrachloroethylene		
alpha-Pinene	7.06	yes
n-Propylbenzene	6.41	–
Propylene dichloride: see 1,2-Dichloropropane		
Styrene	9.04	yes
TCE: see Trichloroethylene		
1,1,2,2-Tetrachloroethane	9.98	yes
Tetrachloroethylene perchloroethylene, PCE	10.00	yes
Tetrahydrofuran	10.30	yes
Toluene	8.90	yes
1,2,4-Trichlorobenzene	4.6	–
1,1,1-Trichloroethane methyl chloroform	9.40	yes
1,1,2-Trichloroethane	9.64	yes
Trichloroethylene TCE	11.47	yes
1,2,3-Trichloropropane	6.1	yes
Trifluoromethylbenzene OXSOL 2000	7.35	yes
1,2,4-Trimethylbenzene	9.92	–
1,3,5-Trimethylbenzene	7.29	–
Vinyl acetate	11.40	yes
Vinyl chloride	17.35	–
m-Xylene	7.78	yes
o-Xylene	8.11	yes
p-Xylene	8.42	yes

[a] Listed twice in the SKC's table, with 10.40 and 10.35 mL/min.

[b] Listed twice in the SKC's table, with 3.95 and 8.34 mL/min. Ask Analyt-MTC which rate applies before you report a result.

CHAPTER 3

Contacts

Contact and support

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Analyt-MTC can help with

- deciding whether your site counts as low velocity;
- compounds that are not in this note;
- the compounds listed with two rates;
- ordering samplers and accessories.

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