

# ISO 23320:2022-04 (E)

## Workplace air - Gases and vapours - Requirements for evaluation of measuring procedures using diffusive samplers

---

Contents	Page
Foreword .....	v
Introduction .....	vi
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	1
4 Symbols and abbreviated terms .....	1
5 Types of samplers .....	3
6 Requirements .....	3
6.1 General .....	3
6.2 Sampler requirements .....	3
6.2.1 Nominal uptake rate .....	3
6.2.2 Air velocity/sampler orientation .....	3
6.2.3 Sampler leak test .....	4
6.2.4 Shelf life .....	4
6.2.5 Sampler identification (for commercially available diffusive samplers) .....	4
6.2.6 Marking .....	4
6.2.7 Instructions for use .....	4
6.3 Measuring procedure requirements .....	5
6.3.1 Sampling procedure requirements .....	5
6.3.2 Analytical procedure requirements .....	5
6.3.3 Expanded uncertainty .....	6
6.3.4 Method description .....	6
7 General test conditions .....	7
7.1 Reagents .....	7
7.2 Apparatus .....	7
7.3 Independent method .....	7
7.4 Generation of a calibration gas mixture .....	8
7.4.1 General .....	8
7.4.2 Determination of mass concentration .....	8
8 Test methods .....	9
8.1 General .....	9
8.2 Sampler test methods .....	9
8.2.1 Determination of (nominal) uptake rate .....	9
8.2.2 Air velocity .....	10
8.2.3 Sampler leak test .....	11
8.2.4 Shelf life (for Type A impregnated supports) .....	11
8.2.5 Sampler identification .....	12
8.2.6 Marking .....	12
8.2.7 Instructions for use .....	12
8.3 Measuring procedure test methods .....	12
8.3.1 Determination of the sampling conditions .....	12
8.3.2 Analytical procedure test methods .....	13

8.3.3	Method recovery and method precision .....	15
8.4	Uncertainty of measurement .....	17
8.4.1	Identification of random and non-random uncertainty components .....	17
8.4.2	Estimation of individual uncertainty components .....	17
8.4.3	Calculation of expanded uncertainty .....	19
9	Test report .....	19
<b>Annex A (informative) Fundamentals of diffusive sampling .....</b>		<b>20</b>
<b>Annex B (informative) Estimation of uncertainty of measurement .....</b>		<b>23</b>
<b>ISO 23320:2022(E) Annex C (informative) Calculation of uptake rates from diffusion coefficients .....</b>		<b>33</b>
<b>Annex D (informative) Example of estimation of expanded uncertainty .....</b>		<b>35</b>
<b>Bibliography .....</b>		<b>38</b>