

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 |
| | Annex A (informative) Fundamentals of diffusive sampling | 20 |
| | Annex B (informative) Estimation of uncertainty of measurement | 23 |
| | ISO 23320:2022(E) Annex C (informative) Calculation of uptake rates from diffusion coefficients | 33 |
| | Annex D (informative) Example of estimation of expanded uncertainty | 35 |
| | Bibliography | 38 |