

# ISO 10882-2:2024-04 (E)

## Health and safety in welding and allied processes - Sampling of airborne particles and gases in the operator's breathing zone - Part 2: Sampling of gases

---

<b>Contents</b>		<b>Page</b>
Foreword .....		v
Introduction .....		vi
<b>1</b>	<b>Scope .....</b>	<b>1</b>
<b>2</b>	<b>Normative references .....</b>	<b>2</b>
<b>3</b>	<b>Terms and definitions .....</b>	<b>2</b>
3.1	General terms .....	2
3.2	Measurement terms .....	2
3.3	Welding terms .....	4
3.4	Analytical terms .....	4
<b>4</b>	<b>Description of measurement methods .....</b>	<b>5</b>
4.1	General .....	5
4.2	Direct reading electrical apparatus .....	6
4.2.1	Applicability .....	6
4.2.2	Operating principles .....	6
4.2.3	Availability .....	6
4.3	Detector tubes .....	6
4.3.1	Applicability .....	6
4.3.2	Pumped detector tubes .....	6
4.3.3	Diffusive detector tubes .....	7
4.4	Indirect methods involving laboratory analysis .....	7
4.4.1	Applicability .....	7
4.4.2	Pumped sampler methods .....	7
4.4.3	Diffusive sampler methods .....	8
<b>5</b>	<b>Requirements .....</b>	<b>8</b>
<b>6</b>	<b>Assessment strategy .....</b>	<b>8</b>
<b>7</b>	<b>Measurement strategy .....</b>	<b>9</b>
7.1	General .....	9
7.2	Personal exposure measurements .....	9
7.3	Fixed-point measurements .....	9
7.4	Selection of measurement conditions and measurement pattern .....	9
7.4.1	General .....	9
7.4.2	Screening measurements of time-weighted average concentration and worst- case measurements .....	9
7.4.3	Measurements for comparison with occupational exposure limit values and periodic measurements .....	10
<b>8</b>	<b>Sampling .....</b>	<b>10</b>
8.1	Sampling position .....	10
8.1.1	Personal sampling .....	10
8.1.2	Fixed-point sampling .....	11
8.2	Sampling equipment .....	11
8.2.1	Direct reading electrical apparatus .....	11
8.2.2	Detector tubes .....	11

8.2.3	Pumped sorbent tubes .....	11
8.2.4	Diffusive samplers .....	11
8.2.5	Construction materials .....	11
8.3	Sample filtration .....	11
8.4	Multiple sampling .....	11
8.5	Volume of sampling line .....	12
8.6	Flow rate .....	12
8.7	Handling of temperature, pressure and humidity data .....	12
<b>9</b>	<b>Measurement of individual gases and vapours .....</b>	<b>12</b>
9.1	General .....	12
9.2	Ozone (0,01 ppm to 3 ppm) .....	12
9.2.1	Special sampling requirements .....	12
9.2.2	Direct reading electrical apparatus .....	12
9.2.3	Detector tubes .....	13
9.2.4	Indirect methods involving laboratory analysis .....	13
9.3	Carbon monoxide (3 ppm to 500 ppm) .....	13
9.3.1	Direct reading electrical apparatus .....	13
9.3.2	Detector tubes .....	13
9.3.3	Indirect methods involving laboratory analysis .....	13
9.4	Carbon dioxide (500 ppm to 100 000 ppm) .....	13
9.4.1	Origin .....	13
9.4.2	Direct reading electrical apparatus .....	13
9.4.3	Detector tubes .....	14
9.4.4	Indirect methods involving laboratory analysis .....	14
9.5	Nitric oxide (1 ppm to 100 ppm) and nitrogen dioxide (0,3 ppm to 250 ppm) .....	14
9.5.1	General .....	14
9.5.2	Direct reading electrical apparatus .....	14
9.5.3	Detector tubes .....	14
9.5.4	Indirect methods involving laboratory analysis .....	14
9.6	Vapours .....	15
9.6.1	General .....	15
9.6.2	Direct reading electrical apparatus .....	15
9.6.3	Detector tubes .....	15
9.6.4	Indirect methods involving laboratory analysis .....	15
<b>10</b>	<b>Recording of test data and presentation of results .....</b>	<b>15</b>
	<b>Annex A (informative) Measurement of individual gases and vapours .....</b>	<b>17</b>
	<b>Annex B (informative) Example of a test report .....</b>	<b>18</b>
	<b>Bibliography .....</b>	<b>21</b>