

مركز الإمارات العالمي للاعتماد

Emirates International Accreditation Centre

Specific Requirements for Accreditation of Air Quality Testing Laboratories

EIAC-RQ-LB-008

Signatories	
Approved:	Head of Laboratories Accreditation Department

Revision history			
Issue no.	Rev. No.	Details	Date
00	00	Issue for use	05-10-2026

Table of Contents

1.0	Forward	3
2.0	Definitions.....	3
3.0	Scope	4
4.0	General Requirements.....	4
5.0	Structural requirements.....	4
6.0	Resource Requirements.....	4
7.0	Process Requirements.....	8
8.0	Management System Requirements.....	14
9.0	References.....	15
Annex 1: The Maximum Permissible Error Limits for Sensors Used to Measure Ambient Air Quality.....		16
Annex 2: The Maximum Permissible Error Limits for Sensors Used to Measure Air Quality And Environmental Pollutants in Specific Industrial Facility Components.		17
Annex 3: The Maximum Permissible Error Limits for Sensors That Are Used to Measure Air Quality And Environmental Pollutants in Specific Elements in Non-Industrial Premises and Workplaces.....		18
Annex 4: Standard Test Methods for Indoor and Workplace Environments.		19
Annex 5: Standard Test Methods for Outdoor and Ambient Atmosphere Testing.		22
Annex 6: Standard Test Methods for Stationary Sources Emissions Testing.....		28
Annex 7: Standard Test Methods for Transport Exhaust Emissions Testing.		33
Annex 8: Standard Test Methods for Clean Rooms Testing.		35

1.0 Forward

- 1.1 This document describes the requirements for accreditation of Air quality testing laboratories and/or its attached or standalone mobile testing unit/s in Testing under the accreditation program operated by Emirates International Accreditation Center (EIAC).
- 1.2 The requirements for accreditation of Testing Laboratories are basically the current edition of ISO/IEC 17025 including relevant latest editions of EIAC Requirements available at www.eiac.gov.ae and as well as the criteria for performing testing according to the technical standards defined in the scope of accreditation by each Laboratory.
- 1.3 The laboratories are required to comply with all the requirements listed in the latest edition of the international standard ISO/IEC 17025 “General requirements for the competence of testing and calibration laboratories”, While the Specific Criteria document EIAC-RQ-LB-008 shall be used in conjunction with ISO/IEC 17025. Further, the laboratory shall follow the national and local laws and regulations as applicable.
- 1.4 This document should be read in conjunction with the International Standard ISO/IEC 17025 “General requirements for the competence of testing and calibration laboratories” , and EIAC document EIAC-RQ-GNL-001, EIAC-RQ-GNL-002 Accreditation Requirements.
- 1.5 While accreditation will normally be an indication of the quality of services offered by the Laboratories, it should not be regarded as a guarantee that the Laboratory will always maintain a particular level of performance. It shall not, in any way, diminish the contractual obligation between the Laboratory and its users.
- 1.6 This document is subject to revision periodically when deemed necessary. It is the responsibility of the Accredited Laboratories to ensure that the latest version of this document is available for reference and implementation.

2.0 Definitions

For the purpose of these Requirements, the relevant terms and definitions are given in the latest edition of ISO/IEC17025 in addition to the following supporting definitions:

2.1 Air Quality Testing Laboratory:

Any laboratory which is performing measurements and/or sampling in Ambient, Indoor, Stationary source emissions and clean rooms. These parameters may include gases, Particulates, meteorological parameters, noise, and lighting.

2.2 Laboratory Proficiency Testing Program:

Determinations of laboratory testing performance by means of inter- laboratory comparisons organized by external bodies.



Note: For the purposes of this document, the term laboratory proficiency tests means continuous schemes – where laboratories are required to participate at regular intervals on a continuous basis.

2.3 Inter-laboratory comparisons

Refer to the assessment and comparison of the performance of different laboratories when conducting the same or similar tests or measurements.

3.0 Scope

3.1 The scope of the accreditation program shall cover the tests carried out for air quality testing as given in Annexes 4 to 8 which includes: (Ambient, Indoor, stationary source emissions, transport exhaust emissions and clean rooms).

3.2 Laboratories may apply for accreditation of other tests not listed in Annexes 4 to 8; however, accreditation will depend on availability of resources and expertise accordingly, EIAC shall inform the applicant laboratory whether the test can be accredited or not. For in-house and laboratory-developed methods, the relevant clauses of ISO/IEC 17025: 2017 shall apply.

4.0 General Requirements

4.1 Impartiality

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

4.2 Confidentiality

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply. It's the laboratory's responsibility to protect the confidentiality of its customers when using any rented equipment, customers' information shall not be disclosed at any case to equipment owner without customer prior approval.

5.0 Structural requirements

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

6.0 Resource Requirements

6.1 General

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

6.2 Personnel

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply, in addition to:

6.2.1 Technical Responsible/ Technical Manager/ Technical Supervisor

6.2.1.1 Education: Qualifications of minimum graduation or equivalent with air related discipline (B.Sc. degree in environmental Science /Chemistry /or equivalent).

6.2.1.2 Work Experience: 5 years' work experience (reduced to 3 years in case of higher education degrees) in laboratory sector as environmental engineer/analyst/technician with ability.

- a. To demonstrate competence in specific technical processes used within the environmental testing.
- b. To perform calculations necessary to convert field data into a final result.
- c. To interpret and explain results.

6.2.1.3 Should possess knowledge of the current Emirates regulatory requirements and applicable Codes of Practice including but not limited to:

- a. Federal Law No. (24) of 1999 on the Protection and Development of the Environment.
- b. Federal Law No. (11) of 2006 amending provisions of Federal Law No. (24) of 1999.
- c. Cabinet Decree No. (12) of 2006 regarding Regulation Concerning Protection of Air from Pollution.
- d. Ministerial Resolution 359/2015 regarding the technical requirements for air quality monitoring devices (applicable for quarries and crushers).

6.2.1.4 Should possess a combination of technical knowledge, experience and skills relevant to the measurement methods listed at accreditation scope.

6.2.1.5 Should have a clear understanding of all sampling equipment and instruments used when carrying out the relevant measurements. ;

6.2.1.6 Should have familiarity with any analytical methods used to analyses samples collected using the relevant methods.

6.2.2 Environmental engineer/ Analysts /Technicians or equivalent position:

6.2.2.1 Work Experience: one year practical experience in air quality testing;

6.2.2.2 Should have a clear understanding of all sampling equipment and instruments used when carrying out the relevant measurements;

6.2.2.3 Should be familiar with any analytical methods used to analyze samples collected using the relevant methods.

6.2.2.4 Have an independent ability to perform calculations necessary to convert field data into a final result.

6.2.3 Analysis of results, including statements of conformity or opinions and interpretations

The personnel responsible for the opinions and interpretation included in test reports should, in addition to the appropriate qualifications, training, experience and satisfactory knowledge of the testing carried out, also have:

6.2.3.1 Work Experience: not less than 5 years' practical experience (reduced to 3 years in case of higher education degrees) in air quality testing.

6.2.3.2 Knowledge of the general requirements expressed in the UAE legislation and standards (as explained in section 6.2.1.3); and

6.2.3.3 An understanding of the significance of deviations is found regarding the normal conditions.

6.2.3.4 Have the statistical knowledge required to select and apply decision rules.

6.2.4 Personnel Records

Training Records for authorized staff should include at least:

- Training records on the scope of measurements from known training providers in this field either local or international.
- records of the operators should include experimental and theoretical training program on operation, calibration, and routine maintenance of the test equipment.

6.3 Facilities and environmental conditions

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

6.4 Equipment

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply, in addition to:

6.4.1 Master equipment to be registered with EIAC. The laboratory shall have access to all items of sampling, measurement and test equipment required for the correct performance of the tests (including sampling, preparation of test, testing, processing and analysis of test data).

6.4.2 In those cases where the laboratory needs to use equipment outside its permanent control, it shall ensure that the requirements of ISO/IEC 17025:2017 are met.

6.4.3 The equipment used for measurement shall be capable of achieving the measurement accuracy defined in Cabinet Decree No. (86) Of 2023 regarding technical regulations for controlling air quality (Annexes 1,2 and 3).



- 6.4.4 Laboratory documents shall include a clear procedure for handling, maintenance, verification, intermediate checks and calibration (internal and /or external) for each specific type of equipment, to meet the requirements of ISO/IEC 17025:2017, test methods requirements, and the laboratory acceptance criteria.
- 6.4.5 If some equipment is rented and not under permanent laboratory control, the laboratory shall retain at least the following records:
- The identity of the item of equipment and its software
 - The manufacturer's name, type identification, and serial number or other unique identification
 - Checks that equipment complies with the specification.
 - Dates, results and copies of reports and certificates of all calibrations, adjustments, acceptance criteria and the due date of next calibration.
- 6.4.6 The laboratory shall establish and maintain procedures for servicing equipment before and after each measurement or series of measurements in order to independently quantify any environmental failing and calibration drift.
- 6.4.7 Measurement values that indicate failing or drift shall be evaluated for usability before they are reported to the customer as final results.
- 6.4.8 Equipment used for field measurement activities shall be calibrated and /or checked (where applicable) prior to use.
- 6.4.9 Criteria for the acceptance of equipment calibration and / or intermediate checks shall be established.
- 6.4.10 Zero checks for gas measuring equipment shall be performed by pure nitrogen cylinders.
- 6.4.11 Expiry dates of chemical sensors included to any of lab equipment shall be identified, controlled and will be communicated to lab related personnel.
- 6.4.12 If repair of defective equipment shall more than three months. The laboratory shall inform EIAC, without delay, of defective equipment and action plan to deal with this situation.
- 6.5 Metrological traceability:**
- All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply, in addition to:
- 6.5.1 It is EIAC policy that all accredited air quality testing laboratories shall use standard gas cylinders and reference standards or calibrated artifacts for the validation/verification of critical steps and processes in their methods.
- 6.5.2 The gas monitoring equipment shall be calibrated at accredited lab according to the ISO 17025



- 6.5.3 The calibration of gases analyzer shall be multipoint covering the range from 50-150% of the measurement range.
- 6.5.4 The traceability of the standard gas cylinders used for intermediate checks and /or internal calibration can be demonstrated by ensuring it is supplied by a reference material producer accredited to ISO 17034 for the gas mixture/concentration of interest.
- 6.5.5 Traceability for oxygen measurement is also required, the use of cleaned dry ambient air with an oxygen content of 20.9% as a field check gas is acceptable (relative uncertainty 0.5 %) as defined in BS EN 14789:2017.
- 6.6 Externally provided products and services:**
- 6.6.1 All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply, in addition to:
- 6.6.2 When a laboratory subcontracts work, whether because of unforeseen reasons (e.g. workload, need for further expertise or temporary incapacity), this work shall be placed with a competent subcontractor accredited in the same scope of required tests.
- 6.6.3 The laboratory is responsible to the customer for the subcontractor's work.

7.0 Process Requirements

7.1 Review of requests, tenders, and contracts:

- 7.1.1 All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply, in addition to:

It's the responsibility of the lab to document all exceptions that will be requested by the customer out of the accredited test methods including sampling, duration , and number of measurements.

7.2 Selection, verification, and validation of methods

- 7.2.1 All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply, in addition to:

The test methods of air quality monitoring can be found in the website of the following organizations:

1. Standards New Zealand
2. Standards Association of Australia
3. United States Environmental Protection Agency
4. European and International standards
5. International Standardization Organization Subcommittee:
 - ✓ ISO/TC 146/SC 1: Stationary source emissions
 - ✓ ISO/TC 146/SC 2: Workplace atmospheres
 - ✓ ISO/TC 146/SC 3: Ambient atmospheres

This document and all its contents are property of Emirates International Accreditation Centre (EIAC). The content is protected by copyrights laws. Any printed copy of it shall be treated as 'Uncontrolled'. Always refer to the controlled online version.....Page 8 of 36



- ✓ ISO/TC 146/SC 4: General aspects
 - ✓ ISO/TC 146/SC 5: Meteorology
 - ✓ ISO/TC 146/SC 6: Indoor air
6. Or any equivalent test method (standards or In-house methods) but the selected test methods should contain at least the following information:
- a. Appropriate identification;
 - b. Scope;
 - c. Description of the type of item to be tested;
 - d. Parameters or quantities and ranges to be determined;
 - e. Equipment, including technical performance requirements;
 - f. Reference standards and reference materials required;
 - g. Environmental conditions required and any stabilization period needed;
 - h. description of the procedure, including
 - ✓ affixing of identification marks, handling, transporting, storing and preparation of items,
 - ✓ checks to be made before the work is started,
 - ✓ checks that the equipment is working properly and, where required, calibration and adjustment of the equipment before each use,
 - ✓ the method of recording the observations and results,
 - ✓ any safety measures to be observed;
 - i. Criteria and/or requirements for approval/rejection;
 - j. data to be recorded and method of analysis and presentation;
 - k. The uncertainty or the procedure for estimating uncertainty.

The test methods should be defined in the scope of accreditation in terms test name, range, test method code as explained in the following table:

Type of Activity	Test Materials/ Products	Test Name	Test Method
Part 1: Initial, Surveillance & Reassessment			
Air Quality Monitoring	Ambient/ Outdoor Air Quality	Sulphur Dioxide (SO ₂) Range (3.0 -500 ppb)	EN 14212
		Carbon Monoxide (CO) Range (0.1 -50 ppm)	ISO 8760
		Carbon Dioxide (CO ₂) Range (10 -5000 ppm)	ISO 16000-26
		Ozone (O ₃)	EN 14625

This document and all its contents are property of Emirates International Accreditation Centre (EIAC). The content is protected by copyrights laws. Any printed copy of it shall be treated as 'Uncontrolled'. Always refer to the controlled online version.....Page 9 of 36

		Range (0.3 -500 ppb)	
		Sulphur Dioxide (SO ₂) Range (3.0 -500 ppb)	EN 14212
		Carbon Monoxide (CO) Range (0.1 -50 ppm)	In house Method (Lab code)
		Ozone (O ₃) Range (0.3 -500 ppb)	In house Method (Lab code)

7.3 Sampling

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply, in addition to:

7.3.1 It's EIAC's policy that sampling is mandatory for all laboratories seeking accreditation in the field of air quality testing, hence:

1. The laboratory shall establish and maintain procedures for the selection and documentation of field sampling and measurement points, collection, preservation, and transportation of samples, and operation of measurement instruments under variable conditions in the field environment.
2. ISO 16000 (all parts), ISO 16017-1, ISO 16017-2, ISO 12884 and ISO 9359 provide guidance for sampling strategies for sampling and field measurements.

7.3.2 Indoor Air Quality Measurements

7.3.2.1 Sample position

The sampling probe should be located between 150 to 200 cm from walls, and 100 to 200 cm from the floor at the center of the room or an occupied zone, not directly in front of air supply diffusers, induction units, floor fans, or heaters, or the exhaled breath of the operator, not under direct sunlight that will impact instrumentation, not within 3.5 m of an elevator or entrance if sampled at a corridor / lobby, 3m from doors.

7.3.2.2 Sampling Criteria

Measurement should not be made in any part of the premises/building where it is totally enclosed but not served by MVAC system, such as store rooms, plant rooms, switch rooms, or kitchens (in the case of restaurants), etc.

7.3.2.3 Sampling Period

Measurements should be made on an 8-hour basis except otherwise specified. Where it is not practicable to take 8-hour continuous measurement, surrogate measurement (i.e., an intermittent measurement strategy based on the average of half-hour measurements conducted at four time-slots) is accepted. Environmental engineer should take into account the operation pattern of the premises/building when choosing the four time-slots. As a

guideline, the four time-slots should be evenly distributed over the business hours, for office for example, buildings whereas for public places they should cover the worst-case scenario such as periods of highest occupancy.

7.3.2.4 Number of Sampling Points

At least one sample should be taken from each floor or from each area serviced by a separate air- handling unit. For large floor space, the guidelines for the minimum required number of sampling points are as follow:

Area of building (m ²) serviced by MVAC system	Minimum number of sampling points
Less than 3,000	1 per 500 m ²
3,000 - <5,000	8
5,000 - <10,000	12
10,000 - <15,000	15
15,000 - <20,000	18
20,000 - <30,000	21
More than 30,000	1 per 1200 m ²

7.3.3 Sampling Criteria for Ambient Air Measurements

7.3.3.1 The analyzer should be protected from rain, condensation, and rapid temperature fluctuation when operating in the field. Consideration should be given to equipment protection against excessively high or low temperatures. High temperatures may permanently damage sensitive electronic equipment, while low temperatures may cause condensation to form in instruments resulting in permanent damage.

7.3.3.2 Ensure all optical components are adequately protected against moisture effects (dew, precipitation).

7.3.3.3 Place the analyzer in an enclosure with atmospheric control so the temperature remains constant within $\pm 5^{\circ}\text{C}$. Adherence to these limits will contain the amount of drift caused by temperature variations.

7.3.3.4 Record the temperature and pressure of the atmosphere sample.

7.3.4 Sampling Criteria for Stationary Source Emissions Measurements.

The EN 15259 can be used as guidance for sampling requirements for monitoring stack emissions to air



7.4 Handling of test or calibration items

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

7.5 Technical records

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

7.6 Evaluation of measurement uncertainty

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply, in addition to:

- 1 Laboratory management should be aware of the effect that their own uncertainty of measurement will have effect on test results produced in their laboratory.
- 2 The lab shall estimate the uncertainty of measurements according to the requirements of the standard test method used or using any of below listed methods as a guide for its estimation process:
 - EURACHEM, GUM, ISO 11222, ISO 13752 and ISO 20988.
- 3 Sources contributing to the uncertainty include, but are not necessarily limited to, the reference standards and reference materials used, methods and equipment used, allowable span and zero drifts, environmental conditions, pressure and temperature corrections, properties and condition of the item being tested, and the operator.
- 4 Lab should report measurement of uncertainty in different individual range in absolute unit terms instead of percentage except for the measured expressed in ratio (e.g.: Oxygen).

7.7 Ensuring the validity of results

7.7.1 All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply, in addition to:

- a. It's the laboratory responsibility to ensure that PT or ILC reports will be matching to these criteria
- b. ILC (at least three accredited participants)
- c. the assigned value of PTs or ILCs is determined based on consensus values from expert laboratories or consensus value from participants.
- d. the assigned value shall be calculated using robust statistical methods as given in Annex C of ISO 13528:2022.
- e. The determination of standard deviation for proficiency assessment shall be done using one of the following methods as given in sub sections 8.2 and 8.4 of ISO 13528:2022:
 - By perception of experts
- f. The standard deviation for proficiency assessment shall be smaller than the maximum permissible error of analytes defined by regulatory authority or the test method.
 - By use of a general model

- g. The value of standard deviation for proficiency assessment can be derived from a general model e.g. Horwitz or Thompson models for the reproducibility of test methods.
- h. The PT or ILC report should include the criteria for acceptability of an assigned value and standard deviation for proficiency assessment in terms of its fitness for purpose.

7.8 Reporting of results

7.8.1 All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply, in addition to:

- a. In case of ambient measurements, GPS coordinates and Description of the measurement sites, Operational conditions, and surrounding conditions shall be included.
- b. The test reports/certificates shall include the signatures of the laboratory manager and operator.
- c. Test reports or certificates shall include the uncertainty associated with the measurement along with the confidence interval and coverage factor.
- d. When a statement of conformity to a specification or standard is provided, the laboratory shall employ decision rule based on binary statement with guard band and statements of conformity should be reported as:
 - a. Pass - acceptance based on guard band; the measurement result being below the acceptance limit, $AL = TL - w$.
 - b. Fail - rejection based on guard band; if the measurement result is above the acceptance limit, $AL = TL - w$.

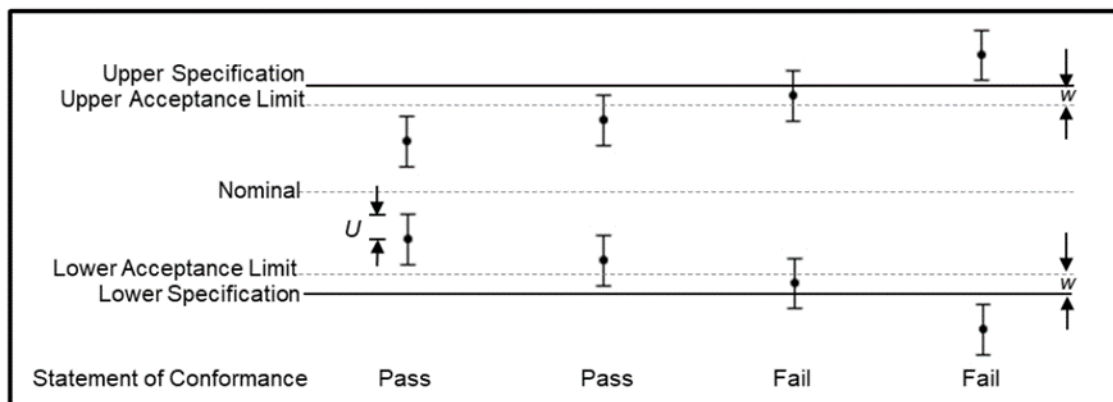


Figure1: Graphical representation of a Binary statement with a guard band (ILAC-G8:09/2019)

7.9 Complaints

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

7.10 Nonconforming work

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

7.11 Control of data and information management

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

8.0 Management System Requirements

8.1 Options

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

8.2 Management system documentation

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

8.3 Control of management system documents

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

8.4 Control of records

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply, in addition to:

- All records shall be maintained for a period specified by the client or regulatory authority or in the absence of such specificity for a minimum of four (4) years from the generation of the test reports/certificates.
- All records, except those which are generated by automated data collection systems or equipment, recorded directly, shall be promptly signed by the person responsible for producing the records, legibly and in permanent ink.

8.5 Actions to address risks and opportunities

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

8.6 Improvement

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

8.7 Corrective actions

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

8.8 Internal audits

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply, in addition to:

- The laboratory shall cover the sub-contractor's activities in its internal audit program, the internal audit of such subcontracted activities should be carried out during actual execution of the job at the subcontractor site.

- b. Internal audit program shall include witness of onsite activities and should be carried out during actual execution of the job at the customers' site.

8.9 Management reviews

All listed requirements under this sub clause as per the international standard ISO/IEC 17025:2017 shall apply.

9.0 References

- 9.1 Law number 2/2010 on conditions required for licensing laboratories operating in the emirate of Dubai.
- 9.2 ISO/ IEC 17025: 2017, General requirement for the competence of testing and calibration laboratories.
- 9.3 EIAC-RQ-GNL-001 General Accreditation Requirements.
- 9.4 EIAC-RQ-GNL-002 Conditions for using EIAC symbol.
- 9.5 EIAC-RQ-GNL-003 Accreditation Services Fee Structure.
- 9.6 EIAC-RQ-GNL-011 EIAC Requirements on Measurement Uncertainty in Testing, Calibration and Clinical/Medical Laboratories Instruments.
- 9.7 EIAC-RQ-GNL-012 EIAC Requirements on Metrological Traceability of Measurement Results

Annex 1: The Maximum Permissible Error Limits for Sensors Used to Measure Ambient Air Quality.

جدول (1) الخطأ الأقصى المسموح به لأدوات قياس جودة الهواء المحيط

#	نوع أداة القياس Instruments (sensors)	الخطأ الأقصى المسموح به MPE (Maximum permissible error)
1	مقياس الإضاءة / Lighting	±10 Lux
2	مقياس الضجيج / Noise	±10 dB
3	مقياس الحرارة / Thermometer	±0.5°C
4	مقياس الرطوبة النسبية / Relative Humidity	±5%
5	مقياس سرعة الرياح / Wind speed	±1.2 m/s
6	مقياس اتجاه الرياح / Wind direction	±5°
7	مقياس الضغط الجوي / Air pressure	±50 Pa

Annex 2: The Maximum Permissible Error Limits for Sensors Used to Measure Air Quality And Environmental Pollutants in Specific Industrial Facility Components.

جدول (2)

حدود الخطأ الأقصى المسموح به لمجسات قياس ملوثات جودة الهواء والبيئة لعناصر محددة للمنشآت الصناعية

Air quality analyzers Permissible error				
#	الملوثات Gas Monitored	الرمز Abbreviation	الخطأ الأقصى الصفري المسموح به Zero level permissible error	الخطأ الأقصى المسموح به للمجال اثناء العمل Working range Permissible error (During operation)
1	Sulfur dioxide	SO ₂	$\pm 3 \times 10^{-9}$	$\pm 10\%$
2	Hydrogen Sulfide	H ₂ S	$\pm 3 \times 10^{-9}$	$\pm 10\%$
3	Nitrogen Oxides	NO _x	$\pm 3 \times 10^{-9}$	$\pm 10\%$
4	Carbon Monoxide	CO	$\pm 0.2 \times 10^{-6}$	$\pm 10\%$
5	Carbon Dioxide	CO ₂	$\pm 4 \times 10^{-6}$	$\pm 10\%$
6	Ozone	O ₃	$\pm 3 \times 10^{-9}$	$\pm 10\%$
7	Hydrocarbon	HC	$\pm 0.2 \times 10^{-6}$	$\pm 10\%$
8	Methane	CH ₄	$\pm 0.2 \times 10^{-6}$	$\pm 10\%$
9	Benzene, Toluene, Ethylbenzene and Xylene	BTEX	$\pm 1 \times 10^{-9}$	$\pm 10\%$



Annex 3: The Maximum Permissible Error Limits for Sensors That Are Used to Measure Air Quality And Environmental Pollutants in Specific Elements in Non-Industrial Premises and Workplaces.

جدول رقم (3)

حدود الخطأ الأقصى المسموح به لمجسات قياس ملوثات جودة الهواء والبيئة لعناصر محددة للمنشآت غير الصناعية وأماكن العمل

Instrument/ Sensors	MPE
المركبات العضوية المتطايرة / VOC	± 5%
مقياس ثاني أكسيد الكربون / CO ₂	± 5%
أول أكسيد الكربون / CO	± 5%
الفورملدهيد / CH ₂ O	± 5%
الأوزون / O ₃	± 5%
ثاني أكسيد النيتروجين / NO ₂	± 5%
الجسيمات العالقة / PM _{2.5} , PM ₁₀ , TSP	± 5%
درجة الحرارة / T	± 0.3°C
الرطوبة النسبية / RH%	± 5%

Annex 4: Standard Test Methods for Indoor and Workplace Environments.

Analyte	Method	Technology
Total Suspended Particulate Matter	ASTM D4096	High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 0.1 µm)	CEN/TS 17660-2	High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 0.2 µm)	CEN/TS 17660-2	High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 0.3 µm)	CEN/TS 17660-2	High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 0.5 µm)	CEN/TS 17660-2	High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 1.0 µm)	CEN/TS 17660-2	High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 2.5 µm)	ISO 16000-37	High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 3.0 µm)	CEN/TS 17660-2	High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 4.0 µm)	CEN/TS 17660-2	High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 5.0 µm)	CEN/TS 17660-2	High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 6.0 µm)	CEN/TS 17660-2	High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 7.0 µm)	CEN/TS 17660-2	High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 8.0 µm)	CEN/TS 17660-2	High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 9.0 µm)	CEN/TS 17660-2	High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 10.0 µm)	ISO 16000-37	High-Volume Sampler and Gravimetric analysis
Sulphur Dioxide (SO ₂)	EN 14212	Ultraviolet fluorescence
Carbon Monoxide (CO)	ISO 8760	Chemical Reaction
Carbon Dioxide (CO ₂)	ISO 16000-26	Non-Dispersive Infrared Spectrometry (NDIR)
Ozone (O ₃)	EN 14625/ ISO 10313/ ISO 13964	Chemiluminescence/ Ultraviolet fluorescence
Ammonia (NH ₃)	EN 17346	Sampling and Ion Chromatography (IC)
Hydrogen sulfide (H ₂ S)	ASTM D4323	Rate of change of reflectance
Oxides of Nitrogen (NO _x)	ISO 8761	Colorimetric gas detection
Nitrogen Monoxide (NO)	ISO 8761	Colorimetric gas detection
Nitrogen Dioxide (NO ₂)	ISO 8761	Colorimetric gas detection
Hydrogen fluoride (HF)	ISO 21438-3	Sampling and Ion Chromatography (IC)
Hydrogen chloride (HCL)	ISO 21438-2	Sampling and Ion Chromatography (IC)

This document and all its contents are property of Emirates International Accreditation Centre (EIAC). The content is protected by copyrights laws. Any printed copy of it shall be treated as 'Uncontrolled'. Always refer to the controlled online version..... Page 19 of 36



Asbestos	ISO 22262-2	Gravimetric and microscopical methods
Sampling of volatile organic compounds	ISO 16000-5	Active or passive sampling and gas chromatography using
Organic Carbons (VOCs, VOCs, SVOCs)	ISO 16000-6/ ISO 16000-25	active sampling on sorbent tubes, thermal desorption and
Determination of total (gas and particle-phase) polychlorinated dioxin-like biphenyls (PCBs) and polychlorinated dibenzo-p-dioxins/dibenzofurans (PCDDs/PCDFs)	ISO 16000-14	Collection on sorbent-backed filters and analysis by high resolution gas chromatography combined with high resolution mass spectrometry (HRGC/HRMS)
Formaldehyde [HCOH] and other	ISO 16000-3/ SO 16000-4	Active sampling method and HPLC/ Diffusive sampling
Determination of phthalates	ISO 16000-33	gas chromatography/mass spectrometry (GC/MS)
Mercaptans (organic thiols)	ASTM D2913	Gas chromatography-Flame Ionization Detection
Methyl mercaptan	ASTM D2913	Gas chromatography-Flame Ionization Detection
Ethyl mercaptan	ASTM D2913	Gas chromatography-Flame Ionization Detection
Dimethyl sulfide (DMS)	ASTM D2913	Gas chromatography-Flame Ionization Detection
Dimethyl Disulfide(DMDS)	ASTM D2913	Gas chromatography-Flame Ionization Detection
Aluminum (Al)	ASTM D7035	ICP-OES
Antimony (Sb)	ASTM D7035	ICP-OES
Arsenic (As)	EN 15841	ICP-OES
Boron (B)	ASTM D7035	ICP-OES
Barium (Ba)	ASTM D7035	ICP-OES
Calcium (Ca)	ASTM D7035	ICP-OES
Cadmium (Cd)	EN 15841	ICP-OES
Cobalt (Co)	ASTM D7035	ICP-OES
Chromium (Cr)	ASTM D7035	ICP-OES
Copper (Cu)	ASTM D7035	ICP-OES
Iron (Fe)	ASTM D7035	ICP-OES
Mercury (Hg)	ASTM D7035	ICP-OES
Potassium (K)	ASTM D7035	ICP-OES
Lithium (Li)	ASTM D7035	ICP-OES
Lead (Pb)	EN 15841/ ISO 8518	ICP-OES

This document and all its contents are property of Emirates International Accreditation Centre (EIAC). The content is protected by copyrights laws. Any printed copy of it shall be treated as 'Uncontrolled'. Always refer to the controlled online version..... Page 20 of 36



Magnesium (Mg)	ASTM D7035	ICP-OES
Manganese (Mn)	ASTM D7035	ICP-OES
Mercury (Hg)	ASTM D7035	ICP-OES
Molybdenum (Mo)	ASTM D7035	ICP-OES
Nickel (Ni)	EN 15841	ICP-OES
Selenium (Se)	ASTM D7035	ICP-OES
Silver (Ag)	ASTM D7035	ICP-OES
Sodium (Na)	ASTM D7035	ICP-OES
Strontium (Sr)	ASTM D7035	ICP-OES
Tellurium (Te)	ASTM D7035	ICP-OES
Titanium (Ti)	ASTM D7035	ICP-OES
Thallium (Tl)	ASTM D7035	ICP-OES
Vanadium (V)	ASTM D7035	ICP-OES
Zinc (Zn)	ASTM D7035	ICP-OES
Total gaseous mercury	EN 15852	Cold Vapour Atomic Absorption Spectrometry (CVAAS)
Temperature (T)	AS/NZS 3580.14/ISO 8756	Direct measurement
Relative Humidity (RH)	AS/NZS 3580.14/ISO 8756	Direct measurement
Noise Exposure Level	ISO 9612	Direct Measurements
Light intensity	ISO/CIE 8995-1	Direct Measurements
Determination of heat stress at work place	ISO 7243	Wet Bulb Globe Temperature
Total Bacterial Count (TBC)	ISO 16000-36	Quantitative determination
A Total Fungal Count	ISO 16000-22	Quantitative determination

Annex 5: Standard Test Methods for Outdoor and Ambient Atmosphere Testing.

Analyte	Method	Technology
Total Suspended Particles (TSP)	ASTM D4096	Beta-Ray Absorption / High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 0.1 µm)	ISO 10473/ EN 12341	Beta-Ray Absorption / High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 0.2 µm)	ISO 10473/ EN 12341	Beta-Ray Absorption / High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 0.3 µm)	ISO 10473/ EN 12341	Beta-Ray Absorption / High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 0.5 µm)	ISO 10473/ EN 12341	Beta-Ray Absorption / High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 1.0 µm)	ISO 10473/ EN 12341	Beta-Ray Absorption / High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 2.5 µm)	ISO 10473/ EN 12341	Beta-Ray Absorption / High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 3.0 µm)	ISO 10473/ EN 12341	Beta-Ray Absorption / High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 4.0 µm)	ISO 10473/ EN 12341	Beta-Ray Absorption / High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 5.0 µm)	ISO 10473/ EN 12341	Beta-Ray Absorption / High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 6.0 µm)	ISO 10473/ EN 12341	Beta-Ray Absorption / High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 7.0 µm)	ISO 10473/ EN 12341	Beta-Ray Absorption / High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 8.0 µm)	ISO 10473/ EN 12341	Beta-Ray Absorption / High-Volume Sampler and Gravimetric analysis
Particulate Matter (PM 9.0 µm)	ISO 10473/ EN 12341	Beta-Ray Absorption / High-Volume Sampler and Gravimetric analysis

Particulate Matter (PM 10.0 µm)	ISO 10473/ EN 12341	Beta-Ray Absorption / High-Volume Sampler and Gravimetric analysis
Sulphur Dioxide (SO ₂)	EN 14212/ ISO 10498	Ultraviolet fluorescence
Carbon Monoxide (CO)	EN 14626/ISO 4224	Non-Dispersive Infrared (NDIR) sensors
Carbon Dioxide (CO ₂)	ISO 16000-26	Non-Dispersive Infrared (NDIR) sensors
Ozone (O ₃)	EN 14625/ ISO 10313/ ISO	Chemiluminescence/ Ultraviolet fluorescence
Ammonia (NH ₃)	EN 17346	Passive sampling and Ion Chromatography analysis
Hydrogen sulfide (H ₂ S)	ASTM D4323	Reflectance
Nitrogen Oxides (NO _x)	EN 14211/ISO 7996	Chemiluminescence
Nitrogen Monoxide (NO)	EN 14211/ISO 7996	Chemiluminescence
Nitrogen Dioxide (NO ₂)	EN 14211/ISO 7996	Chemiluminescence
gaseous acid air pollution index	ISO 4220	potentiometric titration
Asbestos	ISO 22262-2/ISO 10312/ ISO	gravimetry/transmission electron microscopy
Volatile Organic Carbons (VOCs)	ASTM D8460	Real-time measurement by gas chromatography
Methane	ISO 25140	Real-time measurement by gas chromatography
Ethane	ISO 14965	Cryogenic preconcentration and direct flame ionization detection
propane	ISO 14965	Cryogenic preconcentration and direct flame ionization detection
n-butane	ISO 14965	Cryogenic preconcentration and direct flame ionization detection
isobutane	ISO 14965	Cryogenic preconcentration and direct flame ionization detection
n-pentane	ISO 14965	Cryogenic preconcentration and direct flame ionization detection
n-hexane	ISO 14965	Cryogenic preconcentration and direct flame ionization detection
n-heptane	ISO 14965	Cryogenic preconcentration and direct flame ionization detection
Ethylene	ISO 14965	Cryogenic preconcentration and direct flame ionization detection
Propene	ISO 14965	Cryogenic preconcentration and direct flame ionization detection
Butenes	ISO 14965	Cryogenic preconcentration and direct flame ionization detection



Acetylene (C ₂ H ₂)	ISO 14965	Cryogenic preconcentration and direct flame ionization detection
Cyclopentane	ISO 14965	Cryogenic preconcentration and direct flame ionization detection
Cyclohexane	ISO 14965	Cryogenic preconcentration and direct flame ionization detection
Benzene	EN 16253/ISO 14965	Differential Optical Absorption Spectroscopy (DOAS)/ Cryogenic preconcentration and direct flame ionization detection
Toluene	EN 16253/ISO 14965	Differential Optical Absorption Spectroscopy (DOAS)/ Cryogenic preconcentration and direct flame ionization detection
Chlorobenzene	EN 16253/ISO 14965	Differential Optical Absorption Spectroscopy (DOAS)/ Cryogenic preconcentration and direct flame ionization detection
Ethylbenzene	EN 16253/ISO 14965	Differential Optical Absorption Spectroscopy (DOAS)/ Cryogenic preconcentration and direct flame ionization detection
p-Xylene	EN 16253/ISO 14965	Differential Optical Absorption Spectroscopy (DOAS)/ Cryogenic preconcentration and direct flame ionization detection
m-Xylene	EN 16253/ISO 14965	Differential Optical Absorption Spectroscopy (DOAS)/ Cryogenic preconcentration and direct flame ionization detection
o-xylene	EN 16253/ISO 14965	Differential Optical Absorption Spectroscopy (DOAS)/ Cryogenic preconcentration and direct flame ionization detection
1,2-dichlorobenzene	EN 16253/ISO 14965	Differential Optical Absorption Spectroscopy (DOAS)/ Cryogenic preconcentration and direct flame ionization detection
1,3-dichlorobenzene	EN 16253/ISO 14965	Differential Optical Absorption Spectroscopy (DOAS)/ Cryogenic preconcentration and direct flame ionization detection
1,4-dichlorobenzene	EN 16253/ISO 14965	Differential Optical Absorption Spectroscopy (DOAS)/ Cryogenic preconcentration and direct flame ionization detection
Naphthalene	EN 16253/ISO 14965	Differential Optical Absorption Spectroscopy (DOAS)/ Cryogenic preconcentration and direct flame ionization detection
Trichloroethylene	EN 16253/ISO 14965	Differential Optical Absorption Spectroscopy (DOAS)/ Cryogenic preconcentration and direct flame ionization detection

This document and all its contents are property of Emirates International Accreditation Centre (EIAC). The content is protected by copyrights laws. Any printed copy of it shall be treated as 'Uncontrolled'. Always refer to the controlled online version..... Page 24 of 36



Tetrachloroethylene	EN 16253/ISO 14965	Differential Optical Absorption Spectroscopy (DOAS)/ Cryogenic preconcentration and direct flame ionization detection
Styrene	EN 16253/ISO 14965	Differential Optical Absorption Spectroscopy (DOAS)/ Cryogenic preconcentration and direct flame ionization detection
Polycyclic aromatic hydrocarbons	ISO 12884, CEN/TS 16645	Collection on sorbent-backed filters with gas chromatographic/mass spectrometric analyses
benzo[a]pyrene	EN 15549	gas chromatography with mass spectrometric detection
Mercaptans (organic thiols)	NIOSH 2542 or equivalent	collection of samples with Gas Chromatography or real-time measurement by gas chromatography
Methyl mercaptan	NIOSH 2542 or equivalent	collection of samples with Gas Chromatography or real-time measurement by gas chromatography
Ethyl mercaptan	NIOSH 2542 or equivalent	collection of samples with Gas Chromatography or real-time measurement by gas chromatography
Dimethyl sulfide (DMS)	NIOSH 2542 or equivalent	collection of samples with Gas Chromatography or real-time measurement by gas chromatography
Dimethyl Disulfide(DMDS)	NIOSH 2542 or equivalent	collection of samples with Gas Chromatography or real-time measurement by gas chromatography
Determination of N-nitrosamines in Air	EN 16516 & CEN/TS 17985	LC-MS/MS
Nitrosodimethylamine	EN 16516 & CEN/TS 17985	LC-MS/MS
N-Nitrosomethylethylamine	EN 16516 & CEN/TS 17985	LC-MS/MS
N-Nitrosodiethylamine	EN 16516 & CEN/TS 17985	LC-MS/MS
N-Nitrosodipropylamine	EN 16516 & CEN/TS 17985	LC-MS/MS
N-Nitrosodiisopropylamine	EN 16516 & CEN/TS 17985	LC-MS/MS
N-Nitrosodibutylamine	EN 16516 & CEN/TS 17985	LC-MS/MS
N-Nitrosopiperidine	EN 16516 & CEN/TS 17985	LC-MS/MS
N-Nitrosopyrrolidine	EN 16516 & CEN/TS 17985	LC-MS/MS
N-Nitrosomorpholine	EN 16516 & CEN/TS 17985	LC-MS/MS
Aluminum (Al)	ASTM D7035	ICP-OES
Antimony (Sb)	ASTM D7035	ICP-OES
Arsenic (As)	EN 15841	ICP-OES
Boron (B)	ASTM D7035	ICP-OES
Barium (Ba)	ASTM D7035	ICP-OES



Calcium (Ca)	ASTM D7035	ICP-OES
Cadmium (Cd)	EN 15841	ICP-OES
Cobalt (Co)	ASTM D7035	ICP-OES
Chromium (Cr)	ASTM D7035	ICP-OES
Copper (Cu)	ASTM D7035	ICP-OES
Iron (Fe)	ASTM D7035	ICP-OES
Mercury (Hg)	ASTM D7035	ICP-OES
Potassium (K)	ASTM D7035	ICP-OES
Lithium (Li)	ASTM D7035	ICP-OES
Lead (Pb)	EN 15841	ICP-OES
Magnesium (Mg)	ASTM D7035	ICP-OES
Manganese (Mn)	ASTM D7035	ICP-OES
Mercury (Hg)	ASTM D7035	ICP-OES
Molybdenum (Mo)	ASTM D7035	ICP-OES
Nickel (Ni)	EN 15841	ICP-OES
Selenium (Se)	ASTM D7035	ICP-OES
Silver (Ag)	ASTM D7035	ICP-OES
Sodium (Na)	ASTM D7035	ICP-OES
Strontium (Sr)	ASTM D7035	ICP-OES
Tellurium (Te)	ASTM D7035	ICP-OES
Titanium (Ti)	ASTM D7035	ICP-OES
Thallium (Tl)	ASTM D7035	ICP-OES
Vanadium (V)	ASTM D7035	ICP-OES
Zinc (Zn)	ASTM D7035	ICP-OES
Total gaseous mercury	EN 15852	Cold Vapour Atomic Absorption Spectrometry (CVAAS)
Temperature (T)	AS/NZS 3580.14/ISO 8756	Direct measurement
Relative Humidity (RH)	AS/NZS 3580.14/ISO 8756	Direct measurement
Noise Level Measurement (Leq/Min/Max)	AS/NZS 3580.14:2014	Direct measurement
Light intensity	AS/NZS 3580.14:2014	Direct measurement

This document and all its contents are property of Emirates International Accreditation Centre (EIAC). The content is protected by copyrights laws. Any printed copy of it shall be treated as 'Uncontrolled'. Always refer to the controlled online version..... Page 26 of 36



Wind Speed (WS)	AS/NZS 3580.14:2014	Direct measurement
Wind Direction (WD)	AS/NZS 3580.14:2014	Direct measurement
Barometric Pressue	AS/NZS 3580.14:2014	Direct measurement
Solar Radiation	AS/NZS 3580.14:2014	Direct measurement
Electromagnetic Field	AS/NZS 3580.14:2014	Direct measurement
Rain (Rainfall / Drip Rate)	AS/NZS 3580.14:2014	Direct measurement
Rain (Droplet Size)	AS/NZS 3580.14:2014	Direct measurement
Rain (Wind Velocity)	AS/NZS 3580.14:2014	Direct measurement
Rain (Water Pressure)	AS/NZS 3580.14:2014	Direct measurement

Annex 6: Standard Test Methods for Stationary Sources Emissions Testing.

Analyte	Method	Technology
Total Suspended Particles (TSP)	ASTM D4096	High-Volume Sampler/Gravimetry
Particulate Matter Emissions from Stationary Sources	EN 13284-1/ EN 13284-2	High-Volume Sampler/Gravimetry
Particulate Matter (PM 0.1 µm)	EN 13284-1/ EN 13284-2	High-Volume Sampler/Gravimetry
Particulate Matter (PM 0.2 µm)	EN 13284-1/ EN 13284-2	High-Volume Sampler/Gravimetry
Particulate Matter (PM 0.3 µm)	EN 13284-1/ EN 13284-2	High-Volume Sampler/Gravimetry
Particulate Matter (PM 0.5 µm)	EN 13284-1/ EN 13284-2	High-Volume Sampler/Gravimetry
Particulate Matter (PM 1.0 µm)	EN 13284-1/ EN 13284-2	High-Volume Sampler/Gravimetry
Particulate Matter (PM 2.5 µm)	EN 13284-1/ EN 13284-2/ ISO	High-Volume Sampler/Gravimetry
Particulate Matter (PM 3.0 µm)	EN 13284-1/ EN 13284-2	High-Volume Sampler/Gravimetry
Particulate Matter (PM 4.0 µm)	EN 13284-1/ EN 13284-2	High-Volume Sampler/Gravimetry
Particulate Matter (PM 5.0 µm)	EN 13284-1/ EN 13284-2	High-Volume Sampler/Gravimetry
Particulate Matter (PM 6.0 µm)	EN 13284-1/ EN 13284-2	High-Volume Sampler/Gravimetry
Particulate Matter (PM 7.0 µm)	EN 13284-1/ EN 13284-2	High-Volume Sampler/Gravimetry
Particulate Matter (PM 8.0 µm)	EN 13284-1/ EN 13284-2	High-Volume Sampler/Gravimetry
Particulate Matter (PM 9.0 µm)	EN 13284-1/ EN 13284-2	High-Volume Sampler/Gravimetry
Particulate Matter (PM 10.0 µm)	EN 13284-1/ EN 13284-2/ ISO	High-Volume Sampler/Gravimetry
Total Particulate Matter (TPM)	EN 13284-1/ EN 13284-2	High-Volume Sampler/Gravimetry
Dust Content	EN 13284-1/ ISO 9096/ ISO	High-Volume Sampler/Gravimetry
Sulphur Dioxide (SO ₂)	EN 14791/ ISO 7935	Ion Chromatography/ NDIR/FTIR/NDUV
Carbon Monoxide (CO)	EN 15058 / ISO 12039	Infrared Absorption Method
Carbon Dioxide (CO ₂)	ISO 12039	Infrared Absorption Method
Oxygen (O ₂)	EN 15058 / ISO 12039	Paramagnetism
Ammonia (NH ₃)	EN 2826	Direct Measurements
Hydrogen sulfide (H ₂ S)	ASTM D4323	Gas Chromatography/ Optical Reflectance
Oxides of Nitrogen (NO _x)	EN 14792 and ISO 10849	Chemiluminescence/NDIR/FTIR/NDUV
Nitrogen Monoxide (NO)	EN 14792 and ISO 10849	Chemiluminescence/NDIR/FTIR/NDUV

This document and all its contents are property of Emirates International Accreditation Centre (EIAC). The content is protected by copyrights laws. Any printed copy of it shall be treated as 'Uncontrolled'. Always refer to the controlled online version..... Page 28 of 36



Nitrogen Dioxide (NO ₂)	EN 14792 and ISO 10849	Chemiluminescence/NDIR/FTIR/NDUV
Hydrogen fluoride (HF)	ISO 15713	Isokinetic Sampling/ ISE or Ion chromatography
Silicon Fluoride [SiF ₄]	ISO 15713	Isokinetic Sampling/ ISE or Ion chromatography
Hydrogen chloride (HCL)	EN 1911	Ion Selective Electrode
Nitrous Oxide (N ₂ O)	ISO 21258	Non-dispersive infrared method (NDIR)
Sulphur Trioxide (SO ₃)	ASTM D2010	Isokinetic sampling/Lead Dioxide speciation/ barium-thorin titration / Ion chromatography
Formaldehyde [HCOH] and other Carbonyl Compounds	CEN/TS 18040/CEN/TS 17638	Active sampling method and HPLC/ Diffusive sampling method and HPLC
Carbon	ISO 8178-3	filter-type smoke meter
Total Volatile Organic Carbons (VOCs)	EN 12619	Continuous flame ionization detector method
Dioxins and Furans, PCDDs (Polychlorinated dibenzo-p-dioxins) and Determination of greenhouse gas emissions in Iron and steel industry	EN 1948 Parts 1,2 and 3 ISO 19694-1/ISO 19694-2	High-Resolution Gas Chromatography coupled with High-Resolution Mass Spectrometry Determination of Carbon Dioxide (CO ₂) emission by NDIR/FTIR/determination of emission factors/ carbon balance determination
Determination of greenhouse gas emissions in Cement industry	ISO 19694-1/ISO 19694-3	Determination of Carbon Dioxide (CO ₂) emission by NDIR/FTIR/determination of emission factors/ carbon balance determination
Determination of greenhouse gas emissions in Aluminium industry	ISO 19694-1/ISO 19694-4	Determination of Carbon Dioxide (CO ₂) emission by NDIR/FTIR/determination of emission factors/ carbon balance determination
Determination of greenhouse gas emissions in Lime industry	ISO 19694-1/ISO 19694-5	Determination of Carbon Dioxide (CO ₂) emission by NDIR/FTIR/determination of emission factors/ carbon balance determination
Determination of greenhouse gas emissions in Ferroalloys and silicon industry	ISO 19694-1/ISO 19694-6	Determination of Carbon Dioxide (CO ₂) emission by NDIR/FTIR/determination of emission factors/ carbon balance determination
Determination of greenhouse gas emissions in Semiconductor and display industries	ISO 19694-1/ISO 19694-7	Determination of Carbon Dioxide (CO ₂) emission by NDIR/FTIR/determination of emission factors/ carbon balance determination
Aluminum (Al)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Antimony (Sb)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)



Arsenic (As)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Boron (B)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Barium (Ba)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Calcium (Ca)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Cadmium (Cd)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Cobalt (Co)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Chromium (Cr)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Copper (Cu)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Iron (Fe)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Mercury (Hg)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Potassium (K)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Lithium (Li)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Lead (Pb)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Magnesium (Mg)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)

This document and all its contents are property of Emirates International Accreditation Centre (EIAC). The content is protected by copyrights laws. Any printed copy of it shall be treated as 'Uncontrolled'. Always refer to the controlled online version..... Page 30 of 36

Manganese (Mn)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Mercury (Hg)	EN 13211/ISO 5409/EN 14884	Inductively Coupled Plasma-Mass Spectrometer (ICP-MS) /Automated Measuring Systems
Molybdenum (Mo)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Nickel (Ni)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Selenium (Se)	EN 14385/ISO 17211	Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Silver (Ag)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Sodium (Na)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Strontium (Sr)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Tellurium (Te)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Titanium (Ti)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Thallium (Tl)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Tin (Sn)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Vanadium (V)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)



Zinc (Zn)	EN 14385	Wet-Chemical Isokinetic Sampling Procedure/ Inductively Coupled Plasma-Mass Spectrometer (ICP-MS)
Flue Gas Velocity	ISO 10780 & ISO 16911-1	Pitot tubes, type L und type S,
Volumetric Flow Rate	ISO 10780 & ISO 16911-1	Pitot tubes, type L und type S,
Temperature	ISO 10780 & ISO 16911-1	Direct Measurements
Water Vapour	EN 14790	Condensation/Adsorption Technique
Measurement Sections and Sites	ISO 15259	Direct Measurements
Determination of heat stress at work place	ISO 7243	Wet Bulb Globe Temperature
Noise Exposure Level	ISO 9612	Direct Measurements

Annex 7: Standard Test Methods for Transport Exhaust Emissions Testing.

Analyte	Method	Technology
Determination of Particulate Matter Mass from Light Duty Mobile Sources (Vehicles)	ASTM D8108	Gravimetry
Determination of Non-methane hydrocarbon (NMHC) testing from vehicle exhaust	ISO 8178-1/ ISO 8178-2/ ISO 8178-3	Exhaust Gas Analyzer Comply with OIML R 99-1 & 2
Sulphur Dioxide (SO ₂) from Road Vehicles	ISO 3833/ ISO 3929	Exhaust Gas Analyzer Comply with OIML R 99-1 & 2
Carbon Monoxide (CO) from Road Vehicles	ISO 3833/ ISO 3929	Exhaust Gas Analyzer Comply with OIML R 99-1 & 2
Carbon Dioxide (CO ₂) from Road Vehicles	ISO 3833/ ISO 3929	Exhaust Gas Analyzer Comply with OIML R 99-1 & 2
Oxygen (O ₂) from Road Vehicles	ISO 3833/ ISO 3929	Exhaust Gas Analyzer Comply with OIML R 99-1 & 2
Hydrogen sulfide H ₂ S) from Road Vehicles	ISO 3833/ ISO 3929	Exhaust Gas Analyzer Comply with OIML R 99-1 & 2
Nitrogen Monoxide (NO) from Road Vehicles	ISO 3833/ ISO 3929	Exhaust Gas Analyzer Comply with OIML R 99-1 & 2
Nitrogen Dioxide (NO ₂) from Road Vehicles	ISO 3833/ ISO 3929	Exhaust Gas Analyzer Comply with OIML R 99-1 & 2
Carbon Monoxide (CO) from Motorcycles	ISO 3833/ ISO 17479	Exhaust Gas Analyzer Comply with OIML R 99-1 & 2
Carbon Dioxide (CO ₂) from Motorcycles	ISO 3833/ ISO 17479	Exhaust Gas Analyzer Comply with OIML R 99-1 & 2
Hydrocarbons (HC) from Motorcycles	ISO 3833/ ISO 17479	Exhaust Gas Analyzer Comply with OIML R 99-1 & 2
Sulphur Dioxide (SO ₂) from combustion (RIC) engines	ISO 8178-2/ ISO 8178-3	Non-Dispersive Infrared Analyzer
Carbon Monoxide (CO) from combustion (RIC) engines	ISO 8178-2/ ISO 8178-3	Non-Dispersive Infrared Analyzer

This document and all its contents are property of Emirates International Accreditation Centre (EIAC). The content is protected by copyrights laws. Any printed copy of it shall be treated as 'Uncontrolled'. Always refer to the controlled online version..... Page 33 of 36

Carbon Dioxide (CO ₂) from combustion (RIC) engines	ISO 8178-2/ ISO 8178-3	Non-Dispersive Infrared Analyzer
Oxygen (O ₂) from combustion (RIC) engines	ISO 8178-2/ ISO 8178-3	Paramagnetic Detector
Hydrogen sulfide (H ₂ S) from combustion (RIC) engines	ISO 8178-2/ ISO 8178-3	Non-Dispersive Infrared Analyzer
Nitrogen Monoxide (NO) from combustion (RIC) engines	ISO 8178-2/ ISO 8178-3	Non-Dispersive Infrared Analyzer
Nitrogen Dioxide (NO ₂) from combustion (RIC) engines	ISO 8178-2/ ISO 8178-3	Non-Dispersive Infrared Analyzer
Oxygen (O ₂) from Natural Gas-Fired Reciprocating Engines	ASTM D6522	Paramagnetic Detector
Nitrogen Monoxide (NO) from Natural Gas-Fired Reciprocating Engines	ASTM D6522	Electrochemical Cells
Nitrogen Dioxide (NO ₂) from Natural Gas-Fired Reciprocating Engines	ASTM D6522	Electrochemical Cells
Carbon Monoxide (CO) in Car Parks and Tunnels	EN 50545	Diffusion/ Aspirated Detectors
Nitrogen Monoxide (NO) in Car Parks and Tunnels	EN 50545	Diffusion/ Aspirated Detectors
Nitrogen Dioxide (NO ₂) in Car Parks and Tunnels	EN 50545	Diffusion/ Aspirated Detectors
Hydrogen fluoride (HF) in Car Parks and Tunnels	EN 50545	Diffusion/ Aspirated Detectors
Hydrogen chloride (HCL) in Car Parks and Tunnels	EN 50545	Diffusion/ Aspirated Detectors

Annex 8: Standard Test Methods for Clean Rooms Testing.

Analyte	Method	Technology
Classification of air cleanliness by particle concentration	ISO 14644-1	Light Scattering Airborne Particle Counters
Particulate Matter (PM 0.1 µm)	ISO 14644-1	Light Scattering Airborne Particle Counters
Particulate Matter (PM 0.2 µm)	ISO 14644-1	Light Scattering Airborne Particle Counters
Particulate Matter (PM 0.3 µm)	ISO 14644-1	Light Scattering Airborne Particle Counters
Particulate Matter (PM 0.5 µm)	ISO 14644-1	Light Scattering Airborne Particle Counters
Particulate Matter (PM 1.0 µm)	ISO 14644-1	Light Scattering Airborne Particle Counters
Particulate Matter (PM 2.5 µm)	ISO 14644-1	Light Scattering Airborne Particle Counters
Particulate Matter (PM 3.0 µm)	ISO 14644-1	Light Scattering Airborne Particle Counters
Particulate Matter (PM 4.0 µm)	ISO 14644-1	Light Scattering Airborne Particle Counters
Particulate Matter (PM 5.0 µm)	ISO 14644-1	Light Scattering Airborne Particle Counters
Airflow	ISO 14644-3/ EN 12469/ EN 14175-3/ EN 14175-4	Direct Measurement
Air Velocity	ISO 14644-3/ EN 12469/ EN 14175-3/ EN 14175-4	Direct Measurement
Air Changes/Hour.	ISO 14644-3/ EN 12469/ EN 14175-3/ EN 14175-4	Direct Measurement

Differential Pressure,	ISO 14644-3/ EN 12469/ EN 14175-3/ EN 14175-4	Direct Measurement
Leakage test [The HEPA filter integrity]	ISO 14644-3/ EN 12469/ EN 14175-3/ EN 14175-4	Direct Measurement
Temperature	ISO 14644-3/ EN 12469/ EN 14175-3/ EN 14175-4	Direct Measurement
Relative Humidity	ISO 14644-3/ EN 12469/ EN 14175-3/ EN 14175-4	Direct Measurement
Air flow Direction	ISO 14644-3/ EN 12469/ EN 14175-3/ EN 14175-4	Direct Measurement
Recovery Time and Recovery Rate	ISO 14644-3/ EN 12469/ EN 14175-3/ EN 14175-4	Direct Measurement