



UNDERSTANDING ISO 17025 CLAUSE 6.3 – FACILITIES AND ENVIRONMENTAL CONDITIONS

Facility Integrity – The Foundation of Reliable Results

A laboratory's technical competence is only as strong as the environment in which its activities take place. Clause 6.3 reminds us that **facility integrity is not a background requirement—it is a core determinant of measurement validity, staff safety, and customer confidence.**

A well-designed, well-maintained facility ensures that equipment performs as intended, environmental influences are controlled, and staff can work efficiently without unnecessary risk or interference. On Mondays, we set the tone for the week by reinforcing the principle that **a stable, suitable, and well-managed facility is the backbone of every accredited laboratory.**

To meet Clause 6.3, laboratories must ensure that:

- **Environmental conditions do not invalidate results** or compromise the required quality of measurement.
- **Facility layout supports workflow and effective separation of spaces**, prevents cross-contamination, and protects the integrity of samples, test results and equipment.
- **Utilities such as power, water, ventilation, and lighting** are adequate, reliable, and monitored.
- **Access controls** protect sensitive areas and prevent unauthorized interference with samples, testing activities and equipment.
- **Housekeeping and cleanliness** are maintained at levels appropriate to the technical activities performed.

A facility is not static—it evolves with new methods, new equipment, and new risks. This means laboratories must:

- Conduct **regular facility risk assessments**.
- Document and respond to **environmental deviations** (temperature, humidity, vibration, dust, electromagnetic interference, etc.).
- Maintain **preventive maintenance schedules** for infrastructure and utilities.
- Ensure **staff awareness** of how environmental conditions influence measurement uncertainty and result validity.

When facilities are treated as strategic assets rather than operational afterthoughts, laboratories strengthen their impartiality, credibility, and technical authority. A well-managed facility is a visible sign of a laboratory that takes quality seriously.

Environmental Control – Protecting the Validity of Every Result

Environmental conditions are not merely background variables—they are **critical measurement influencers**. Temperature, humidity, vibration, dust, airflow, electromagnetic interference, and even noise can affect equipment performance, sample stability, and staff behaviour. Clause 6.3 requires laboratories to **identify**,



monitor, control, and document these influences to ensure that results remain valid under all operating conditions.

Environmental control begins with understanding **which conditions matter for which activities**. For example:

- Dimensional measurements may require **tight temperature control**.
- Chemical analyses may require **humidity stability** to prevent sample degradation.
- Microbiological testing may require **strict airflow and contamination control**.
- Balances and sensitive instruments may require **vibration-free zones and stable/rigid work benches**.

To comply with Clause 6.3, laboratories must:

- Define **environmental specifications** for each activity or instrument.
- Install **monitoring systems** capable of detecting deviations in real time.
- Maintain **records of environmental data** for traceability and audit readiness.
- Implement **corrective actions** when environmental conditions drift outside acceptable limits.
- Ensure **staff understand the impact** of environmental deviations on measurement uncertainty.

Environmental control is not about perfection—it is about **fitness for purpose**. The key question is always: *Do the environmental conditions support the validity of the results?* A laboratory that actively monitors and manages its environment demonstrates maturity, competence, and a commitment to scientific integrity. Environmental control is not a cost—it is an investment in credibility.

Access Control – Protecting the Integrity of Laboratory Activities

Access control is one of the most underestimated aspects of Clause 6.3. Laboratories must ensure that **only authorized personnel** enter areas where testing, calibration, sample storage, or sensitive equipment are located. Uncontrolled access introduces risks such as contamination, tampering, accidental interference, and compromised impartiality.

Effective access control includes:

- **Physical barriers** (locked doors, restricted zones, controlled entry points).
- **Digital access systems** (key cards, biometric scanners, electronic logs).
- **Visitor management procedures** (sign-in registers, escorts, temporary access badges).
- **Clear signage** indicating restricted areas.
- **Documented authorization lists** for staff and contractors.

Access control is not about limiting movement—it is about **protecting the validity of results**. When unauthorized individuals enter testing areas, the risks include:

- Sample mix-ups or contamination.
- Disturbance of environmental conditions.
- Interference with equipment settings.
- Breaches of confidentiality.
- Compromised chain of custody.



Clause 6.3 requires laboratories to **evaluate risks associated with facility access** and implement controls proportionate to those risks. This includes:

- Reviewing access rights regularly.
- Training staff on the importance of controlled access.
- Ensuring contractors and visitors understand laboratory rules.
- Documenting incidents and taking corrective action.

A laboratory that manages access effectively demonstrates professionalism, impartiality, and a commitment to protecting the integrity of its work.

Housekeeping and Contamination Control – Small Actions, Big Impact

Cleanliness is not cosmetic—it is **a technical requirement**. Clause 6.3 emphasizes that laboratories must maintain facilities that support valid results, and this includes **housekeeping, contamination control, and orderly workspaces**. A clean laboratory reduces risk, improves workflow, and strengthens confidence in the reliability of results.

Effective housekeeping includes:

- Keeping benches and equipment free of unnecessary items.
- Ensuring waste is removed promptly and safely.
- Preventing cross-contamination through proper sample handling.
- Maintaining clean floors, storage areas, and utilities.
- Ensuring chemicals and reagents are stored correctly.
- Using colour-coded cleaning tools where appropriate.

Contamination control is especially critical in laboratories performing:

- Microbiological testing
- Chemical analysis
- Environmental monitoring
- Materials testing
- Forensic or trace analysis

To comply with Clause 6.3, laboratories must:

- Define **cleaning schedules** and responsibilities.
- Document **cleaning procedures** and ensure staff follow them.
- Use **appropriate cleaning agents** that do not interfere with testing.
- Maintain **records of cleaning activities** for audit purposes.
- Train staff on contamination risks and prevention strategies.

A clean laboratory is a safe laboratory—and a credible one. Housekeeping is one of the simplest yet most powerful ways to demonstrate professionalism and technical competence.

Facility Maintenance – Sustaining Reliability Week After Week

Facility maintenance is a critical requirement under Clause 6.3. A laboratory cannot produce reliable results if its infrastructure, utilities, and environmental controls are not maintained proactively. Maintenance is not a reaction—it is a **planned, documented, and risk-based activity**.



Maintenance includes:

- **HVAC systems** to stabilize temperature and humidity.
- **Electrical systems** to ensure stable power supply.
- **Lighting systems** to support accurate visual inspection.
- **Water supply and drainage** for laboratories requiring controlled water quality.
- **Compressed air, gas lines, and extraction systems** where applicable.
- **Structural integrity** of walls, floors, ceilings, and work surfaces.

To comply with Clause 6.3, laboratories must:

- Establish **preventive maintenance schedules**.
- Document **maintenance activities**, including contractor work.
- Record **breakdowns, repairs, and corrective actions**.
- Assess **risks associated with facility failures**.
- Ensure **maintenance does not compromise testing activities**.
- Verify that **post-maintenance checks** confirm continued suitability.

A well-maintained facility reduces downtime, protects equipment, and ensures that environmental conditions remain within acceptable limits. It also demonstrates to auditors and customers that the laboratory is committed to long-term quality and operational excellence.

Maintenance reinforces the message that **quality is continuous, not occasional**.

Facility Stewardship – Everyone Protects the Testing Environment

Clause 6.3 reminds us that facilities and environmental conditions are not passive background elements—they are active contributors to the validity, impartiality, confidentiality and defensibility of every result a laboratory produces. This week's focus has shown that the physical environment is a shared responsibility, and every staff member plays a role in protecting the integrity of the laboratory's operations.

A compliant facility is one that is fit for purpose, risk-assessed, monitored, and maintained. But beyond the infrastructure itself, Clause 6.3 highlights something deeper: the culture of environmental awareness. Staff must understand how temperature, humidity, vibration, airflow, contamination, lighting, noise, and access control influence measurement uncertainty, equipment stability, and sample integrity. When people understand the “why,” they naturally protect the “how.”

Several key themes:

- Environmental control is a technical requirement, not a housekeeping preference.
- Access control protects impartiality, confidentiality, and the chain of custody.
- Housekeeping and contamination control directly influence the reliability of results.
- Preventive maintenance is essential to sustaining stable environmental conditions.
- Facility layout and workflow design reduce risk and improve operational efficiency.

A strong facility management approach requires:

- Documented environmental specifications for each activity.
- Continuous monitoring and recorded evidence of compliance.
- Clear responsibilities for cleaning, maintenance, and environmental checks.
- Prompt corrective action when deviations occur.
- Staff who understand how their behaviour affects the laboratory environment.



The real message of Clause 6.3 is that quality is not only built into methods and equipment—it is built into walls, floors, airflows, access points, and daily habits. When staff take ownership of the environment, the laboratory becomes more resilient, more consistent, and more credible.

A laboratory's environment is one of its most powerful quality tools—when managed well, it protects impartiality, strengthens confidence, and supports every result issued.

