

# A Guide to INMETRO Certification for Solar Modules in Brazil

A Technical & Process Overview for PV Manufacturers

**Content Partner: J. v. G. technology GmbH**

*Turnkey solar module production lines — since 1997*

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# Technical Overview: INMETRO Certification for Solar Modules in Brazil



Created as part of the PVKnowHow Knowledge Network



Prepared by J.v.G. Technology GmbH



European specialists in turnkey solar module production lines

# Key Project Data

## Type 5

**Certification Model**

Product + quality  
management system  
evaluation

## IEC

**Applicable Standards**

IEC 61215 (performance) /  
IEC 61730 (safety)

## 6–9mo

**Certification Timeline**

Typical end-to-end duration  
from engagement to  
certificate

## Brazil

**Target Market**

Mandatory for  
commercialization within  
Brazil

📄 Certification type: INMETRO Type 5 · Standards: IEC 61215 / IEC 61730 · Factory requirement: Audited production facility · Source: PVKnowHow / J.v.G. Technology GmbH

# Why INMETRO Certification Matters

## Legal Requirement

- Mandatory under INMETRO Ordinance No. 004/2011
- No certificate = no legal commercialization in Brazil
- Applies to both domestically produced and imported modules
- Required for grid connection and project financing approvals

## What It Confirms

- Products comply with IEC 61215 and IEC 61730 internationally recognized standards
- Factory can consistently produce compliant modules over time
- Quality management system is effective and audited
- Modules carry the official INMETRO seal – visible market signal

# The Role of the OCP (Certification Body)

## What Is an OCP?

- OCP = Organismo de Certificação de Produto
- INMETRO-accredited third-party certification body
- Examples: TÜV Rheinland, TÜV SÜD, Bureau Veritas, others

## OCP Responsibilities

- Conducts the factory audit and quality system evaluation
- Oversees sample selection and laboratory test coordination
- Issues formal recommendation for certificate issuance

## Key Principle

- Certification cannot be self-declared – OCP engagement is mandatory
- An existing IEC certificate does not replace the OCP process
- OCP conducts annual surveillance audits post-certification

# Factory Audit Process

- 1 — Application & OCP Engagement**

Manufacturer formally engages an INMETRO-accredited OCP

Scope defined: module type(s), production lines, quality system documentation
- 2 — Document Review**

OCP reviews quality manual, production procedures, and process control records

Non-conformities identified and remediation plan agreed
- 3 — On-Site Factory Audit**

OCP auditor visits the production facility

Verifies physical processes match documented procedures; inspects QMS implementation
- 4 — Sample Selection**

Modules selected from production for independent laboratory testing

Sampling protocol follows INMETRO / IEC requirements
- 5 — Audit Findings Resolution**

Manufacturer addresses identified non-conformities before proceeding

OCP confirms corrective actions prior to certificate recommendation


# Quality Management Requirements

## QMS Core Requirements

- Quality management system aligned with ISO 9001 principles
- Documented production procedures for all critical process steps
- Traceability of materials, components, and finished modules
- Calibrated test and measurement equipment with records

## Process Control Evidence

- Incoming material inspection records (cells, glass, encapsulant, backsheet)
- In-process quality checkpoints documented and monitored
- Final EL inspection and flash test data per module
- Non-conformance management and corrective action system

 Type 5 certification verifies both the product design and the factory's ongoing ability to produce compliant modules consistently.

# Sample Testing & IEC Standards

## IEC 61215 — Design Qualification & Type Approval

- Performance testing: output at standard test conditions (STC)
- Environmental durability: damp heat, thermal cycling, humidity freeze
- Mechanical load, hail impact, UV pre-conditioning tests
- Maximum power degradation threshold: no more than 5% loss after stress sequences

## IEC 61730 — Safety Qualification

- Electrical safety: insulation resistance, dielectric withstand, wet leakage current
- Fire classification and thermal resistance testing
- Construction requirements: junction box, cables, connectors, materials
- Application class assignment determines voltage and installation category

## INMETRO-Specific Considerations

- INMETRO standards align with IEC but require local OCP-managed test execution
- Existing CB/IEC reports may reduce repeat testing — but do not replace process
- Energy efficiency labeling (ENCE) assigned upon successful testing (Class A–E)

# Certificate Issuance



- ✔ The INMETRO seal signals compliance with all mandatory Brazilian quality and safety regulations — a prerequisite for market access, grid connection, and project financing.

# Annual Surveillance Audits

## Certification Is Not a One-Time Event

- INMETRO Type 5 requires annual surveillance audits by the OCP
- Audits verify QMS remains effective and products continue to meet standards
- Production changes (new cell types, new formats) may trigger re-evaluation
- Certificate can be suspended if non-conformities are not resolved

## Ongoing Compliance Requirements

- Maintain up-to-date quality records and process documentation
- Report significant product or process changes to the OCP promptly
- Periodic sample testing may be required during surveillance cycle
- Factory must remain accessible for unannounced or short-notice audits

# Common Certification Challenges

## Documentation Gaps

- Incomplete or informal production procedures fail document review
- Lack of calibration records for measurement equipment
- No formal non-conformance management system in place

## Production Facility Readiness


- Factory processes not aligned with documented procedures at time of audit
- Key production steps lack measurable process control parameters
- Traceability breaks between incoming materials and finished modules

## IEC Test Failures

- Encapsulant material or lamination quality issues surface in damp heat testing
- Electrical safety failures linked to junction box or connector specification
- First-time applicants often underestimate sample preparation requirements

# Timeline Expectations

- 1** — **Months 1–2: Application & Document Preparation**  
OCP engaged; quality manual and process documentation submitted for review
- 2** — **Months 2–3: Document Review & Gap Closure**  
OCP reviews documentation; manufacturer addresses identified gaps
- 3** — **Months 3–4: Factory Audit & Sample Selection**  
On-site audit conducted; production samples selected for laboratory testing
- 4** — **Months 4–7: Laboratory Testing (IEC 61215 / IEC 61730)**  
Full IEC test sequences executed by accredited laboratory; typical duration 8–16 weeks
- 5** — **Months 7–9: Certificate Issuance**  
OCP submits recommendation; INMETRO reviews and issues Certificate of Conformity

 Total timeline: 6–9 months under normal conditions. Delays in documentation readiness or test failures extend the process significantly.

# FAQ Highlights

## Does an existing IEC certificate suffice for Brazil?

**No.** INMETRO certification is mandatory and must be conducted through an INMETRO-accredited OCP. Existing IEC reports may reduce re-testing, but do not replace the local process.

## What is the difference between IEC and INMETRO Type 5?

**IEC** is product-type approval only. **INMETRO Type 5** certifies both the product design and the factory's quality management system — ensuring consistent production over time.

## Can a new manufacturer with no prior IEC certification apply?

**Yes.** A new production facility can apply directly. Full IEC 61215 and IEC 61730 test sequences will be required. An experienced turnkey production line provider can significantly reduce preparation time.

## What triggers re-certification?

Significant product changes (new cell technology, new module format) or production process changes must be reported to the OCP and may require partial or full re-evaluation.

# Strategic Conclusion

1

## Market Access Prerequisite

INMETRO certification is the non-negotiable entry requirement for Brazil — the world's 4th largest solar market by annual additions

2

## Factory Readiness is the Critical Variable

Timeline and cost are driven primarily by production facility and QMS readiness — not by the certification process itself

3

## Integrated Approach Reduces Risk

An experienced European turnkey provider builds certification-ready production processes from day one — reducing audit findings and re-testing cycles

☐ Source: PVKnowHow / J.v.G. Technology GmbH · Certification type: INMETRO Type 5 · Standards: IEC 61215 / IEC 61730  
· Market: Brazil

# About the Content Partner

## **J. v. G. technology GmbH** – The DESERT Company

Founded in 1997 in Bavaria, Germany. Family-owned engineering company specializing in turnkey solar module production lines.

More than 90 factory projects delivered worldwide.

On-site team training included – no prior manufacturing experience required.

### Key areas:

Turnkey PV manufacturing lines | DESERT Technology® |  
TÜV-certified module designs | Factory planning to production

[www.jvg-thoma.com](http://www.jvg-thoma.com)

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Source:

<https://www.pvknowhow.com/countries/brazil/inmetro-certification-solar-modules-brazil>

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