

Understanding KS Certification: A Gateway to the South Korean Solar Market

A Technical and Strategic Guide to South Korean Market Entry

Content Partner: J. v. G. technology GmbH

Turnkey solar module production lines — since 1997

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Technical Overview: KS Certification for the South Korean Solar Market



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

KS C 8...

Performance Standard

Design qualification and
type approval — based on
IEC 61215

KS C 8...

Safety Standard

Safety qualification — based
on IEC 61730

6–12 mo

Certification Timeline

From application to
certificate, depending on
manufacturer readiness

3 Tiers

Carbon Footprint Rating

Mandatory tiered scoring —
directly affects market
eligibility

 Certification: KS C 8561 / KS C 8562 · Market: South Korea · Additional requirement: Carbon footprint certification ·
Focus: Solar module manufacturing compliance · Source: PVKnowHow / J.v.G. Technology GmbH

What Is KS Certification?

Definition

- Korean Industrial Standards (KS) — national standardization system for South Korea
- Regulated by the Korean Agency for Technology and Standards (KATS)
- Administered by bodies including the Korea Energy Agency (KEA)
- Covers both product performance and manufacturing quality management

Market Access Implications

- Non-negotiable prerequisite for government-led solar projects
- Required for selling to the broader South Korean market
- Functions as quality assurance and market regulation simultaneously
- Post-certification: annual follow-up audits and product testing required

IEC vs. KS: Key Differences

Dimension	IEC Certification	KS Certification
Basis	IEC 61215 / IEC 61730	KS C 8561 / KS C 8562 (harmonized, not identical)
Scope	Module design and safety — type testing only	Product + production facility evaluation
Factory Audit	Not required	Mandatory on-site inspection
Carbon Footprint	Not required	Mandatory — tiered scoring system
Sample Selection	Manufacturer-provided samples	Auditors select samples directly from production line
Test Location	Accredited laboratory (global)	Accredited laboratory in Korea
IEC Certificate Validity	Accepted as global baseline	Beneficial but grants no exemption from KS process



A manufacturer with existing IEC certificates cannot use them to gain KS approval. The KS process is an independent, holistic evaluation of both product and production environment.

Carbon Footprint Certification: An Additional Barrier

Why It Is Required

- South Korea's renewable energy policy links procurement eligibility to environmental performance
- Carbon footprint scoring is embedded within the KS certification framework
- Modules are rated across three tiers — higher tier = stronger market position

What Must Be Documented

- Full lifecycle CO₂ emissions from raw material to finished module
- Energy source mix used in manufacturing (coal vs. renewables matters)
- Supply chain transparency — origin of cells, glass, encapsulants, frames

Strategic Implication

- Manufacturers with high-carbon supply chains face scoring penalties
- Sourcing from low-carbon regions or using renewable energy in production is advantageous
- Carbon documentation must be prepared before the KS audit — not after

Technical Testing Procedures Under KS

- 1 Visual Inspection**
Assessment of module surface, frame, junction box, and labeling against KS requirements
Deviations from IEC baseline must be identified and documented
- 2 Electrical Performance Testing**
STC and NOCT power output measurements at accredited Korean laboratory
IV curve characterization, Pmax verification, and efficiency confirmation
- 3 Environmental Stress Testing**
Damp heat (85°C / 85% RH, 1000 hrs), thermal cycling, humidity-freeze sequences
Mirrors IEC 61215 protocol — but samples are auditor-selected from production
- 4 Safety Qualification Testing**
Insulation resistance, wet leakage current, dielectric withstand — per KS C 8562
Fire safety class and mechanical load testing also required
- 5 Gel Content & Adhesion Verification**
Encapsulant crosslink degree (gel content) and peel force tests on production samples
Lamination process quality directly impacts test outcomes

Factory Audit Process

Audit Scope

- Full production line inspection by accredited Korean auditors
- Covers all manufacturing steps: stringing, lay-up, lamination, framing, testing
- Quality management system documentation reviewed on-site

Sample Selection Protocol

- Auditors — not the manufacturer — select modules from live production
- Selected samples are sealed and shipped to a Korean accredited laboratory
- No pre-screening or cherry-picking of samples is permitted

Process Documentation Required

- Lamination recipes, temperature profiles, and cycle logs
- In-process quality control records (EL inspection, IV flash test results)
- Equipment calibration certificates and maintenance records

Post-Certification Follow-Up

- Annual surveillance audits required to maintain certificate validity
- Any significant process change must be reported and may trigger re-evaluation
- Certificate can be suspended if audit findings are not resolved within defined timeframe

Certification Timeline: Phase by Phase

1

Phase 1 — Preparation

Gap analysis vs. KS requirements · Carbon footprint documentation · Internal process audit

~1-2 months

2

Phase 2 — Application & Factory Audit

Submission to certification body · Scheduling and conducting on-site factory inspection

~1-3 months

3

Phase 3 — Laboratory Testing

Auditor-selected samples shipped to Korea · Full KS C 8561 / 8562 test sequence

~2-4 months

4

Phase 4 — Review & Issuance

Certification body reviews all results · Certificate issued upon full compliance

~1-3 months

 Total indicative timeline: **6-12 months** from application to certificate. Timeline is heavily influenced by manufacturer preparation quality and responsiveness to audit findings.

South Korean Market Entry Barriers

Regulatory Barriers

- KS certification is mandatory — no alternative compliance pathway exists
- Carbon footprint tiering directly restricts eligibility for public tenders
- Language barrier: all documentation submissions must be in Korean
- Local representative or liaison with Korean certification bodies is effectively required

Operational Barriers

- Factory audit requires production to be running — cannot certify an idle line
- Auditor-selected sampling means production quality must be consistent, not exceptional
- Annual re-audit creates ongoing compliance cost and operational dependency
- Any module design or process change may require partial re-certification

Strategic Planning for Manufacturers

Start Early

- Initiate KS gap analysis 12–18 months before target market entry date
- Carbon footprint data collection takes significant lead time
- Do not assume IEC certification accelerates or simplifies the KS process

Stabilize Production First

- Auditor-selected samples must reflect everyday production — not a best-case run
- Lamination process control, EL inspection, and flash test systems must be fully operational
- Process documentation must be complete, current, and audit-ready

Engage Experienced Support

- An experienced European turnkey provider with KS project history reduces risk significantly
- Local Korean certification consultants are essential for language and regulatory navigation
- Proven turnkey manufacturing concepts come with pre-validated process documentation

Role of the Turnkey Provider in KS Certification

1

Process Readiness

A proven turnkey manufacturing concept delivers pre-validated lamination recipes, calibration records, and process control documentation required for audit

2

Audit Preparation

An experienced European turnkey provider supports manufacturers in conducting internal pre-audits — identifying gaps before the official inspection

3

Reduced Learning Curve

Turnkey lines include on-site team training — operators understand process parameters that directly affect KS test outcomes such as gel content and peel force

❏ Source: PVKnowHow / J.v.G. Technology GmbH — based on composite case study scenarios drawn from real KS certification projects.

Key Takeaways

1 KS certification is a standalone process

IEC certificates are not transferable — a full Korean evaluation is always required

2 Carbon footprint is not optional

Tiered scoring directly determines market eligibility — preparation must begin early

3 Factory audit tests everyday quality

Auditor-selected samples mean consistent production is more important than peak performance

4 Plan for 6–12 months minimum

Timeline depends heavily on preparation quality and responsiveness to findings

5 Experienced support reduces risk

A proven turnkey manufacturing concept with KS project history shortens the path to certification

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

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