



Go to market guide for the BSI Kitemarks for EV Chargers

Guidance document on testing and certification



Who is BSI?

The British Standards Institution (BSI) is a globally recognized National Standards Body, providing trusted **testing, certification, and compliance services**. Through our Product Certification division, we support manufacturers in ensuring that **electric vehicle (EV) chargers** meet essential **safety, smart functionality, interoperability, and cybersecurity** requirements for global market access.

For EV charger manufacturers, BSI offers:

- Third-party testing and certification to **electrical safety, EMC, and wireless standards**;
- Support with **CE, UKCA, and global market access** through the IECCE CB Scheme;
- Voluntary certification schemes such as the **BSI Kitemark™ for EV Charging, Smart Charging, or Accessible Infrastructure**.

BSI helps you confidently navigate evolving technical and regulatory requirements—supporting safe installation, grid integration, user trust, and



FAQs

1 What is EV charger testing and why is it required?

EV charger testing confirms that your product meets legal and technical requirements across key areas including:

- **Electrical safety;**
- **Electromagnetic compatibility (EMC);**
- **Smart charging and cybersecurity;**
- **Wireless connectivity (if applicable);**
- **Environmental performance and durability.**

Testing is essential to affix the **CE** or **UKCA mark**, allowing market access in the EU and UK respectively, and supports wider **global recognition** via the **IECEE CB Scheme**.

2 What types of EV chargers need testing?

All EV chargers, whether **domestic, commercial, public, or network-connected**, must undergo testing. This includes:

- **AC wallboxes** (Mode 3 chargers);
- **DC fast chargers** (public rapid chargers);
- **Smart chargers** with connectivity or demand response features;
- **Accessible EV chargers** intended for public use.

3 What standards apply to my EV chargers?

Your applicable standards will vary depending on the product type and market destination. Common standards include:

- **IEC 61851-1 / IEC 61851-23** – General requirements for conductive charging;
- **IEC 62196 series** – Charging interface (plugs, sockets, connectors);
- **EN 61000-6-x series** – EMC emissions and immunity;
- **ETSI EN 303 645** – IoT cybersecurity baseline (UK/EU);
- **EN 18031** – Radio equipment cybersecurity (EU);
- **PAS 1878 / PAS 1879** – Smart and demand-side response;
- **PAS 1899** – Accessible EV charging.

We'll help you identify the right standards for your product, including those that support **smart, safe, and secure operation**.



4 What is CE and UKCA marking requirements?

CE marking is mandatory for EV chargers sold in the EU, confirming compliance with directives such as:

- Low Voltage Directive (LVD);
- Electromagnetic Compatibility Directive (EMC);
- Radio Equipment Directive (RED).

From **2025**, smart and wireless chargers must also meet **cybersecurity requirements** under RED Article 3.3 (EU). In the UK, The Electric Vehicles (Smart Charge Points) Regulations and the **PSTI Regulations** include cybersecurity requirements. Both marks require:

- Product testing;
- A technical documentation file;
- A **Declaration of Conformity**.

5 What is the BSI Kitemark™ for EV Charging?

The **BSI Kitemark™** is a voluntary mark of excellence. For EV chargers, it can demonstrate:

- Independent **third-party certification** to safety, performance, and interoperability standards;
- Ongoing **surveillance testing and audits**.
- Trusted assurance for **consumers, installers, local authorities, and fleet operators**.



Plug into the market of EV users

Step 1 Read and Understand the Standards

EV chargers must meet specific standards depending on their design, features, and target market. Below are the most commonly applicable standards:

Safety Standards

IEC 61851 series – Electric Vehicle Conductive Charging System

- Part 1: General requirements for all types of conductive EV chargers (AC and DC);
- Part 23: DC charging stations;
- Covers voltage limits, protection mechanisms, communication with the EV, and temperature control.

IEC 62196 series – Plugs, Socket-Outlets, Vehicle Connectors

- Defines physical charging interfaces such as Type 1, Type 2, and CCS;
- Ensures compatibility across manufacturers and regions.

Radio & Connectivity Standards

EN 18031 series – Radio equipment cybersecurity

- Applies in the EU to any EV charger with wireless functionality (Wi-Fi, Bluetooth, GSM);
- Includes RF performance, antenna safety, and cybersecurity.

ETSI EN 303 645 – Cybersecurity for Consumer IoT

- Baseline security for connected products;
- Covers default password handling, secure updates, and privacy.

EMC Standards

EN 61000 series – Electromagnetic Compatibility

- EN 61000-6-1: Generic immunity;
- EN 61000-6-3: Generic emissions;
- Ensures the charger does not interfere with, or get disrupted by, other electrical equipment.

Smart Charging Standards

PAS 1878 – Smart Appliances: Demand-Side Response Functions

- Requirements for chargers to modulate output based on grid demand;
- Enables integration into energy flexibility schemes.

PAS 1879 – Interoperability Framework

- Ensures that smart appliances can communicate with energy management systems;
- Supports market-wide interoperability.

Accessibility Standard

PAS 1899:2022 – Accessible EV Charging

- Covers public charger usability for disabled users;
- Specifies bay dimensions, reach zones, lighting, and display design.

For planning approval and funding, UK public chargers should align with PAS 1899.

Plug into the market of EV users

Step 2 Prepare Your Technical Documentation

- Design drawings and circuit schematics;
- Safety, cybersecurity and EMC risk assessments;
- Radio frequency and cybersecurity design specs;
- User manuals and installation instructions;
- Test reports and supporting evidence;
- Draft Declaration of Conformity.



Step 3 Submit Your Product for Testing

- Engage a notified body (such as BSI) for third-party testing;
- Schedule factory production control (FPC) audits;
- Complete lab tests to required standards;
- Resolve any non-conformities or product modifications.



Step 4 Achieve Certification and Apply the Mark

- Finalise Declaration of Conformity;
- Affix CE or UKCA marking as applicable;
- Consider BSI Kitemark™ certification for added value and consumer confidence.



Go to market ready EV charger

Testing considerations you may want to make when meeting specific market regulations for EV chargers. This is not a comprehensive list, but rather a guide to help provide direction and prompt further thought on EV charger testing.

1 Housing & Electrical Safety

IEC 61851-1/-23

Tested to verify electrical protection, thermal performance, and safe operation across charge modes (AC/DC).

2 Connector & Plug Interface

IEC 62196

Ensures compatibility with Type 1, Type 2, and CCS connectors; proven durability over repeated use.

3 EMC Shielding

IEC 61851-21-2,
EN 61000-6-1 and EN 61000-6-3

Demonstrates immunity from interference and limits emissions to protect surrounding devices.

4 Smart Charging Controller

PAS 1878 / PAS 1879

Verifies grid-responsive features like load balancing, scheduling, and secure data exchange.

5 EU : Radio Equipment Directive (RED)

EN 18031 Standards

Covers antenna performance, signal reliability, and cyber-resilience under Article 3.3 (from 2025).

6 Cybersecurity

Certified to ETSI EN 303 645 & UK PSTI Requirements

Built-in protections against tampering, misuse, and data leaks.

7 Accessibility Features

PAS 1899:2022

Tested for inclusive use—reach height, lighting, audio feedback, and cable handling.

8 Global Market Certification

IECEE CB Scheme Recognized

One tested product can be accepted in 50+ international markets.

BSI Kitemark™ for EV Chargers

Independently tested and continuously audited demonstrates long-term quality, safety, and performance.



Other schemes and market-specific marks to consider

Mark	Region	Purpose
CE Marking	EU	Demonstrates conformity to LVD, EMC, RED, RoHS
UKCA Marking	GB	Required for UK safety, EMC, and installation compliance
IECEE CB Scheme	Global	Simplifies entry into 50+ markets with mutual recognition
PSTI Compliance (UK)	UK	Mandatory cybersecurity baseline from April 2024
Radio Equipment Directive (RED)	EU	Mandatory cybersecurity from August 2025
BSI Kitemark™	UK/Global	Voluntary certification for safety, smartness, or accessibility

Start your EV charger certification journey

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