

BSI: responding to fast-moving electric vehicle charging market

A BSI whitepaper



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By 2035 there will be a: By 2050 there will be a:



increase in vehicles
using UK roads



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Introduction: Electric vehicles, an accelerating market

The market for electric vehicle (EV) charging products is accelerating at pace. Industry figures suggest¹ that there were 395,000 pure-electric cars on UK roads at the end of December 2021, and more than 740,000 plug-in models (including plug-in hybrids).

With increasing consumer demand, greater availability of vehicles and government support, sales of electric vehicles are growing strongly in parallel to the development of UK charging point infrastructure.

This growth is set to continue, with UK roads expected to make way for 23.2² million vehicles (including passenger and HGVs vehicles) by 2023 (55% of all vehicles on the road) and by 2050 possibly up to 49.0 million (100%).

Such an acceleration will require a significant increase in charging stations. Complexity is added by the variety of routes to market for EV charging, which include manufacturer-owned public check points; network providers enabling charging at service stations; and consumer in-home installations via utilities firms, leasing companies and car manufacturers.

Meanwhile, the Government's Rapid Charging Fund³, announced as part of a £500 million

commitment for EV infrastructure, aims to ensure that there is a rapid-charging network ready to meet long-term consumer demand for electric vehicle charge points ahead of need.

This is still an emerging industry, with an influx of new global players that previously had little guidance on excellence and quality. Market growth at this speed requires independent market assurance and this is where BSI can help, with a route map to assurance that includes:

- **BSI Electric Vehicle Charging Kitemark**
- **Supply chain verification (Due diligence)**
- **Type testing**
- **Market access (IECEE CB scheme)**



¹ <https://www.nextgreencar.com/electric-cars/statistics/>

² <https://www.theccc.org.uk/wp-content/uploads/2020/12/The-UKs-transition-to-electric-vehicles.pdf>

³ <https://www.gov.uk/government/publications/government-vision-for-the-rapid-chargepoint-network-in-england>

BSI Electric Vehicle Charging Kitemark

Independent market assurance of quality and safety.

BSI has developed a Kitemark for Electric Vehicle Charging points to address the current industry challenges.

Kitemark certification is the ultimate mark of trust. First developed in the early 20th Century, the Kitemark recognises excellence in manufacturing and service provision. BSI Kitemark certification tells a customer that a company or service goes the extra mile.

The Kitemark will support market assurance around the rapid expansion and technological advancement in electric vehicles and their associated systems.

The Kitemark complements BSI's existing electric vehicle charging standards:

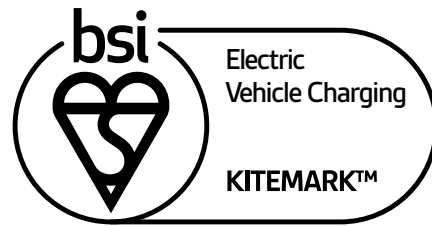
BS EN IEC 61851-1:2019 Electric vehicle conductive charging system Part 1: General requirements

BS EN 62196-1:2014 Plugs, socket-outlets, vehicle connectors and vehicle inlets — Conductive charging of electric vehicles Part 1: General requirements

BS EN 62196-2:2017 Plugs, socket-outlets, vehicle connectors and vehicle inlets — Conductive charging of electric vehicles Part 2: Dimensional compatibility and interchangeability requirements for a.c. pin and contact-tube accessories

BS EN 62196-3:2014 Plugs, socket-outlets, vehicle connectors and vehicle inlets — Conductive charging of electric vehicles Part 3: Dimensional compatibility and interchangeability requirements for d.c. and a.c./d.c. pin and contact-tube vehicle couplers.

Prior to the launch of BSI's Kitemark, assurance was focused solely on compliance with the minimum technical specification, which includes British Standards. The Kitemark helps manufacturers not only meet but also exceed the minimum technical requirements set out by the Office for Zero Emission Vehicles (OZEV) and differentiate themselves from the competition by providing a quality mark from a third party organization.



Good for manufacturers, assurance for consumers

The BSI Kitemark is helpful for manufacturers looking for market differentiation and wishing to export products globally, along with component assemblers and importers.

Consumers and end purchasers who will be increasingly required to install charging points over the next few years will welcome the use of the Kitemark brand, with its strong commercial engagement for procurement decision-makers.

End users and purchasers with limited knowledge of these systems will look for market assurance that the products they install are safe and fit for purpose. The BSI Kitemark provides this.

Due diligence verification and type testing

Although due diligence is not a type 5 scheme like Kitemark it can help provide reassurance. The Due Diligence Verification scheme from BSI does provide reassurance to companies offering their own or third-party products to the market.

The supply chain for EV chargers represents several challenges particularly in terms of finding and verifying trusted suppliers. This has been an important issue in recent months, when due to the Covid-19 pandemic there have been shortages of various substrates.

This reduced availability can impact on the amount of unverified suppliers entering the market, which carries its own risks. Having found a supplier, how much can they be relied on in terms of quality and can any documentation they provide be trusted?

Due diligence verification gives a level of assurance and confidence in the supply chain and in the quality of the product supplied. BSI can provide different levels of assurance based on the level of risk perceived from the supplier.



Confidence Level 1

Suitable for when risk is relatively low, this involves a desktop review of relevant declaration of conformities and test report(s) provided by a company or their supplier.

The products aren't physically tested, but samples are disassembled with components compared against test reports to check for discrepancies between build and bill of materials.

Confidence Level 2

In addition to the documentation review described in Confidence Level 1, BSI conducts electrical safety testing against the relevant product standard on a stock product at one of our Centres of Excellence. Samples are checked to confirm if they meet electrical safety criteria.

Confidence Level 3

This includes all steps covered in level 1 and 2, plus factory production surveillance.

Comparison is made between models being manufactured and models and technical data used for certification. In-line and final inspection quality control tests and procedures are also reviewed.

Each level comes with a Due Diligence Verification certificate from BSI.

Type testing

During the development stages of a product's manufacture, BSI can assist with type testing, based on company requirements according to industry standards and/or manufacturer specifications.

A common challenge when developing a new product lies in the uncertainty around whether the current stage already meets the desired outcome or standard requirements. BSI works with clients to provide testing to help them at any stage of the product development journey. This can help save time and costs.

The main advantage of testing while in the process of developing a product, is that it gives the peace of mind that the product is fit for purpose and will perform as intended. This can reduce the cost of re-working the final product, if it should fail when tested. This in turn can speed up the time taken to launch to market, for a more efficient process.

IECEE CB Scheme – placing products on international markets

As demand for EV chargers grows worldwide, it is important for manufacturers to be able to access international markets with their products.

The IECEE CB scheme offers one route to market, allowing manufacturers to use one test report (CB test report) to place products on to various international markets that form part of a mutual recognition agreement. The IECEE CB Scheme is a single standard for electrical products and components. BSI is an IECEE National Certification Body (NCB).

Currently, there over 50 countries within the IECEE CB scheme. For many, this is perceived as a quick route to compliance across numerous countries. However, as much as the CB scheme is recognized by several countries, there are still some local requirements that will need to be met before a product can be legally placed on to a given market.

BSI team can help navigate through the relevant country's requirements.

Our current scope relating to electrical vehicle charging includes, but is not limited to:

- EV charging
- Electronic controls
- Switches and automatic controls for household appliances
- EMC (Electro Magnetic Compatibility) of products
- Audio visual, information and communication technology

A test and certification report from BSI will be recognised by customs and port authorities and by other NCBs in the 50-plus countries that are members of the IEC.

What is the IECEE CB Scheme?

The Scheme is the IEC's system for conformity testing and certification of electrotechnical equipment and components. The system is based on mutual recognition of CBTCs (Certification Body Test Certificates) by IEC members.

The scheme shows that product complies with applicable standards; or local implementations of them. Even though, some countries may have additional local requirements, the scheme is gaining more recognition and some countries that are not members of the IECEE CB scheme accept the test certificate as proof that the product meets the safety requirements of the applicable standard(s) for that region.

CBTCs are recognised all over the world, from America to Australia, Argentina to Vietnam, Belgium to Bahrain. A full list of participating countries can be found on the ICEE website⁴. Equally, the scheme is gaining more recognition and some countries that are not members of it accept the test certificate as proof that the product meets the safety requirements of the applicable standard(s) for that region.

⁴ <https://www.iecee.org/dyn/www/?p=106:40:0>



What are the benefits of the Scheme for EV charger manufacturers?

Wherever an EV charger is being exported to, a CB certificate can be an important 'first staging post' on the route to compliance. It tells jurisdictions the product already meets many of their requirements. The robustness of the scheme is good for both buyers and sellers. Manufacturers with IECEE CB certificates know that the risks of product recalls and legal problems are lower.

Although it doesn't have its own product mark or symbol, CB certification can be used to obtain national certification marks such as the BSI Kitemark for the UK, the S Mark for Sweden, the GS Mark for Germany, the SAFETY Mark for Singapore and the ETL Mark for the USA. It can also form part of the technical file on a product and be used to support the declaration for CE and UKCA Marking conformity.

It can be seen as a way of speeding up entry to other markets, although other permits may also be needed

to sell a product, depending on individual country requirements. The most widely accepted third-party conformity assessment scheme operating in the world today, the IECEE CB Scheme is a simple type test scheme with no on-going requirements.

Working with BSI

As a fully participating member of the CB scheme, and approved CBTL (CB Testing Laboratory) BSI can help manufacturers achieve CB certification and can identify the relevant local standards for their products. This saves the time and expense of finding an additional accreditation service based in the export market(s) and shipping products abroad for testing.

There is also the opportunity to upgrade a CB certificate to the BSI Kitemark, with no further test needed if products are already certified to IEC standards.

In conclusion

As electric vehicles become the norm on our roads, growth in the market for charging products to keep them moving is accelerating.

BSI offers a wide scope of testing and technical file review services, together with a Kitemark for Electric Vehicle Charging, providing this emerging industry with the opportunity to provide confidence and assurance through certification.

Disclaimer

It is not intended, nor should it be taken to imply, that the information in this paper should override existing legal and regulatory requirements. BSI accepts no liability arising from the use of or reliance on the material contained on this document, which is provided on the basis that the BSI is not rendering professional advice. Before relying on the material, users should carefully make their own assessment as to its relevance for their purposes, and should obtain any appropriate professional advice relevant to their particular circumstances.

Why choose BSI?

BSI has been developing world-leading standards for over 100 years and continues to break new ground. Our blend of heritage and newness makes us unique – we are the only organization that can offer such a powerful combination of innovation and international reach.

We work closely with leading manufacturers to ensure their products meet the latest regulations to gain market access. We focus on delivering a testing and certification partnership underpinned by quality, safety, reliability, and accuracy aligned to your product development requirements. That's why we're best placed to help you understand standards and to meet the requirements.

At BSI we share knowledge, innovation, and best practice to help people and organizations realize their potential. We are client-centric, agile, and collaborative.

BSI: Inspiring trust for a more resilient world.

Our products and services

Knowledge

The core of our business centres on the knowledge that we create and impart to our clients. In the standards arena we continue to build our reputation as an expert body, bringing together experts from industry to shape standards at local, regional and international levels. In fact, BSI originally created eight of the world's top 10 management system standards.

Assurance

Independent assessment of the conformity of a process or product to a particular standard ensures that our clients perform to a high level of excellence. We train our clients in world-class implementation and auditing techniques to ensure they maximize the benefits of standards.

Compliance

To experience real, long-term benefits, our clients need to ensure ongoing compliance to a regulation, market need or standard so that it becomes an embedded habit. We provide a range of services and differentiated management tools which help facilitate this process.



For more information on certification for electric vehicle chargers

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