

Intertek



Eliminate the Mysteries of Global Product Testing & Certification



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Introduction

When planning to sell an electronic or electrical product at home or abroad, you must comply with the legal trading requirements governing that product in your targeted markets. Whether that relates to product safety, use of hazardous substances, EMC emission and immunity rules or energy performance and labeling regulations, it's likely you will have to undertake some sort of product testing to validate your compliance claims. Often you need a formal declaration of product conformity. Furthermore in some territories and for some specific product groups you will be obliged to obtain an independent certification/approval from a recognized body for your product to show it meets minimum requirements.

So how do you decide which testing to do and how much? Where can you learn what regional product regulations apply? And how can you maximize your product compliance to enable you to enter multiple markets quickly and cost effectively? In this paper we'll answer these questions and explore the basic mechanics of testing and certification and how you can apply them to reduce your time to market.

Getting Started

The most fundamental questions you need to answer when anticipating any testing or certification activities are:

- What do I want to sell?
- How long is the intended product life?
- Where do I want to sell it?

Armed with this information you can begin to assess your testing and certification needs.

As a project of this nature has far reaching implications on production costs, return on investment, market access and potentially product liability - a knowledge of workable options and regulatory variables will be invaluable to choosing a cost effective and appropriate route to compliance. So the first action on your list should be to get some expert help. This will save you a great deal of time in extensive research.

The expert could be a senior engineer from your team, an outside consultant or an expert from an established testing laboratory, just be sure of their technical credentials.

Assess the conceptual value of product

The next thing to do is to assess the conceptual product. Is it of high value? Is it technically complex? Is it an unproven technical innovation? Is it likely to be in every household? Is the product likely to have a number of iterations and generations? If you answer yes to any of these questions, then testing and certification is almost certainly going to be recommended – and in some cases required by law. However if your product is of lesser value or each unit is likely to be custom made or a your product is intended to be 'disposable' with perhaps a shorter lifespan - then perhaps testing without a full product certification/approval (at a lower financial investment) will be more appropriate. Documentation such as test reports and certificates are illustrative of the expected safety performance of a product – based on the performance of previously tested units.

Confer with your experts. They will be able to give you advice and guidance on your product obligations and make recommendations about which route would be advisable – testing in-house, or independent testing and certification.

Once the value of a product is determined to warrant a test and certification investment, you'll need to check if it is still financially viable with the requirements of the target market. If compliance for a particular target market turns out to be prohibitively expensive in comparison to the value of the product, then maybe the plan to sell a particular product to a particular country will need to be reconsidered.

To obtain pricing information for the compliance process you will need to contact your test and certification partner who will be happy to supply you with costs and time scales to complete the project. However you will need to give them some basic information to produce the quotation:

Request for Quotation Checklist:

- What is the product?
- What is the intended use? (e.g. domestic, medical, industrial, military, etc.)
- What are the intended geographical markets for the product?
- How many variations will there be on the product? (e.g. color variations, additional functionality for premium models, etc.)
- What is the likely power rating of the product?
- Where will it be manufactured?
- When is the intended launch of the product?

Choosing a testing and certification partner

If your organization doesn't already have a relationship with a testing and certification partner, how should you choose one?

A quick search of the Internet will pull up number of different laboratories you can use. When choosing between them, make a list of your key purchasing drivers and use this as your guide. While keeping production costs down is vital, the companies offering the cheapest rates aren't necessarily the best value. Many manufacturers have found it useful to consider the following:

- Product portfolio (e.g. range of certification/approval marks available)
- Service portfolio (and specifically particular areas of industry or product expertise)
- Geographic "Access" Features (available certifications/approvals and marks that give you maximum market access – or that cover the most geographical areas)
- Reputation (which brand names already choose to work with them and what endorsements have they made?)
- Local service offerings – can they assist in both country of sale and at the manufacturing location?
- Responsiveness – can they give fast, quality service that improves your time to market?
- Do they provide good value/cost effectiveness?

Certification/Approval Marks

There are dozens of certification/approval marks available. Some of these are product specific. Some of these are region or country specific. But almost all deal with a notable

aspect of the product, such as its safety, EMC emissions or immunity, energy efficiency or materials composition. Familiarity with some of the Marks available will help you to determine what you require for your product. Here are some examples of the Marks you are likely to see on various products:

National Marks



Fig 1: Example of a national mark - ETL Mark (USA)

National Marks are issued by a recognized certification body approved by the government of that country. They are often mandatory for country access – even if only for certain product groups.

These Marks are only issued when a product meets the applicable Standards governing that product. In addition, the facility where the product is manufactured has been inspected to ensure continuity.

Products bearing the Marks will also be subject to “surveillance” activities from the issuing certification bodies – where random samples are regularly checked to ensure that all products carrying the certification/approval Mark are made to the same specification as the originally tested products.

Some national schemes also require the manufacturer to have completed a Systems Certification assessment such as ISO9001.

Regional Marks

1) Mandatory



Fig 2: A mandatory regional mark - CE Marking (Europe)

Arguably the most well know “regional mark” is CE Marking. The CE Mark is used by manufacturers selling products in the EU who are obliged by European regulations to make a Declaration of Conformity for their products. This indicates that they meet essential requirements of the European Directives (including characteristic requirements such as safety and EMC performance) that apply to their products.

CE Marking is applied by the manufacturers themselves – it is not issued by a 3rd Party certification body.

2) Voluntary



Fig 3: e.g. of a non-mandatory regional mark - The ENEC Mark (Europe)

Voluntary marks such as ENEC are available from a variety of certification bodies within a region and require product safety testing, a factory inspection and regular product surveillance to be carried out. In this regard they are similar to national Marks. Using regional marks like ENEC means you don't have to repeat your test program for each country, saving you time and money and maximizing market access.

Performance (or Quality) Marks



Some manufacturers use non-mandatory Marks to additionally highlight aspects of product performance or quality. This helps further differentiate their products in the marketplace.

The tests required for such marks are usually conducted against a baseline of recognized criteria for a product.

Fig 4: A Quality & Performance Mark (no regional restrictions)

Materials Marks



Most markets now have in place legislation to minimize the amount of hazardous substances that go into the making of a product. This is to reduce the amount of hazardous material that will end up in landfill at the end of product life which could contaminate land and potentially pose a hazard to people and animals.

Fig 5: A 'Restriction of Hazardous Substances' (RoHS) Mark

Many certification bodies can measure the levels of hazardous substance in products and certify materials compliance with legislation. Some schemes offer product Marks, like the one shown and some offer documentation that can be used for port access and technical files.

Fast Facts: The CB Scheme:

- The CB Scheme is run by an international group of certification bodies known as the IECCE. It enables a mutual acceptance of test reports and certificates dealing with the safety of electrical products and components between member bodies. A manufacturer holding a CB Certificate from one member body can obtain the certification Marks of another.
- The scheme is based on the use of harmonized IEC Standards and declared national differences.
- The CB Scheme is recognized in 49 countries worldwide.

Non-Marking Schemes & Basic Testing Activities

IECEE CB Scheme

Obtaining full product certification through the IECCE CB scheme will help to achieve acceptance and recognition by the authorities of up to 49 countries worldwide. While some authorities accept a CB Certificate as evidence of compliance without the need to apply for a specific national certification, others do not. In this case manufacturers can use their CB Certificate to apply for the nationally recognized certification of their target markets, without the need to conduct all of their testing again from scratch. Sometimes national deviations in Standards and regulations may require some additional assessment of a product, but supplemental tests are not always required as many countries use harmonized Standards. Essentially, one CB certificate can be used in

applications for national certification to all 49 members – ensuring core testing does not need to be repeated.

Test Reports & Certificates

Test Reports & Certificates show that a product has been tested, but they are not a full product certification/approval – i.e. there can be no use of a Mark on the product or packaging. Note that these documents may not always be recognized by government authorities (it largely depends on the status and reputation of the issuing body) but these are widely used and recognized in the distribution channel.

Test reports and paper certificates are typically used in technical files by manufacturers of bespoke, short run or short lifetime products to bring an assurance of product safety to everyone in the supply chain. Known colloquially as “Type test certificates” – many forms of these are available, including:

Certificate of Type Tests - Issued when a complete series of type tests prescribed in a Standard has been made successfully on a product.

Certificate of Short-Circuit Rating - Verifies the short-circuit performance of the design. The Certificate may include the results of other type tests, e.g. mechanical endurance tests.

Certificate of Making and Breaking Capacity - Verifies the overload switching capability of equipment to which a short-circuit rating is not usually assigned. This Certificate may also include the results of other type tests.

Certificate of Temperature-Rise Performance - Verifies the temperature-rise limits of the equipment by performance of the appropriate type test specified by the Standards only where these tests are performed as complete type tests and not as a part of a sequence of tests.

Certificate of Dielectric Performance - Verifies all dielectric ratings of the equipment by performance of the appropriate type tests specified by the Standards only where these tests are performed as a complete type test and not as part of a sequence of tests.

Certificate of Compliance - As well as showing that successful type tests have been conducted against a relevant standard, a certificate of compliance shows that all aspects of all relevant Standards applicable to the product have been met, including physical requirements and labeling. The validity of Compliance certification is limited to the specific item and date of the test, but it is indicative of the safety performance of a model type. These are often used to show compliance of low volume or shorter life products where a full certification/approval is not considered financially viable.

Test Report – A Test Report is issued when otherwise satisfactory tests cannot be included in a Certificate for one or more reasons, e.g. verification of non-standard ratings.

TIP: Quicken time to market with test reports and certificates that can be accepted between country branches of the same organization or via inter-agency agreements known as Memorandums of Understanding (MOU). This approach often removes the need for additional testing, saving time and money as extra samples do not need to be shipped and processed. Additionally, a local agency will speak the native language and can help with interpretation of local Standards and Regulations, reducing the likelihood of oversights and errors in compliance. The local team is also likely to be recognized by the local authorities.

The Benefits of Full Product Certification/Approval

Entering New Markets Abroad

While local markets are easier to secure than foreign ones, certification can make the export process easier and faster. Every country you wish to sell products in may have its own national requirements for safety, electromagnetic compatibility and energy consumption – and full certification/approval can demonstrate conformity with these.

Differentiating Yourself From Competitors

If every manufacturer of electrical or electronic products has to apply a National or Regional Mark to their goods, how can distributors, retailers and consumers differentiate between them? Non-mandatory product certification/approval can differentiate your brand from that of your competitors and visibly demonstrates that you have responded to your duty to produce safe products by investing in 3rd party validation.

Additionally, by undergoing the certification/approval process you demonstrate your support of recognized best practice. With full product certification/approval for your products you can promote their ongoing safety in the marketplace - giving you a long-term competitive advantage.

Anti-Counterfeiting Measures

Safety testing and certification also helps protect you against counterfeiting. Even when market competitors produce counterfeit certifications, you have solid evidence to show that your genuine products are safe, with documented factory inspections, tested products and up-to-date technical files.

Furthermore, most product safety certification/approval schemes require random samples of product to be checked regularly to ensure product continuity. This provides greater chance of spotting a counterfeit early on.

Defense against accusations of liability

Should the worst happen and your product unexpectedly fail – and accusations of product liability become levied against you – product certification/approval provides

compelling evidence that due care was taken to produce a safe product as prescribed by applicable standards.

Recognition by Retailers

Some retailers require products be independently certified/approved by preferred laboratories before they can be stocked on shelves. Certification/approval can increase the number of viable channels you have to market your product.

Maintaining your Certification/Approval

The issuing certification body will conduct random checks on your products to ensure your continuing compliance and typically ask to inspect the manufacturing site on an annual, semi-annual, or even quarterly basis to monitor the process.

Occasionally, the Standards which govern full product certification/approval change or expire, and therefore these will need to be reviewed to ensure compliance with the revised or new Standard. This may be as simple as updating paperwork where the technical file is reviewed, but sometimes additional testing is required.

Another variable to continued certification/approval is critical (sometimes called 'listed') material or component substitution. If these are notified to the certification body, the substitutions can be checked to ensure that the safety of the product has not been compromised. If the certification body is not notified of such changes the certification/approval can potentially become invalid.

Optimizing the Testing and Certification/Approval Process

- Involve your testing and certification partner in the product design phase to help point out potential non-conformities early. This can help save significant time and money in re-testing and re-design later on.
- Where possible, "design for compliance" using the latest version of the appropriate product Standard as a guide.
- Consider scheduling EMC and Safety testing at the same time. Your testing and certification partner can help you plan this to reduce time and costs.
- Check what paperwork the laboratory needs to process your project and compile it as soon as possible. This too can greatly shorten your overall project turnaround and help get products to market faster.

Maximizing Territorial Compliance

Target Markets

Deciding where to launch a completely new product, or choosing where to export an existing one, can be shaped by many things: the activity of competitors, the economy

and wealth of the region, or even the need for a particular product or innovation to meet a local challenge. Considering the product regulations for target territories early in the design phase is essential and can help to maximize potential revenue.

Are the requirements of a particular target market the same as anywhere else in the region? Can the test and certification required for that region be used to gain access to any other markets? For example if country A is the target and countries B & C have the same product regulations (even with some local deviations), then B & C could be viable additional markets as the lion's share of the required compliance work will already be completed.

A great example of this situation is Europe. The Directives governing electrical products in the region apply to all EU member nations, with each country highlighting any local deviations that need to be considered. This means that regional compliance work for regulations such as the General Product Safety Directive, the Low Voltage Directive and the CE Marking Directive provide the fundamental framework for individual country access. Companies can therefore increase their potential revenue with incremental markets of sale.

For wider geographical compliance, utilize the CB Scheme where one test certificate can be recognized by the authorities in multiple countries – or be used as the basis for an application of a National Mark if local certification is required for specific country market access.

Understanding Requirements Beyond Certification

Many manufacturers believe that simply testing their product to specific standards is enough to gain market access when, in fact, there is much more to consider. Every aspect of a product should be examined. Are manufacturers using the right labeling? Is the User Manual in all required languages? Does a product name translate to something improper that could offend local sensibilities? Are manufacturers required to have a local office established in that country manned by local people or those fluent in the local language?

Try to gain an in-depth understanding of market access requirements beyond certification. Additional regulations must be considered and addressed, including local representation, permitted importers, and product classification requirements.

Manufacturers can speak to their local embassy who will be able to provide them with specific guidance, customs forms and even examples of what paperwork will be required to enter specific new markets. Or they can work closely with their testing and certification partner who can also supply them with comprehensive advice and guidance on the requirements for market access.

You may also want to explore pre-shipment inspections. Some countries require these inspections as a demonstration of product regulatory compliance for country access. Many international testing and certification bodies are recognized and trusted by foreign

governments to conduct these inspections so they can also help manufacturers prepare for them. Incorrect labeling, inadequate user guides or improper packaging/branding can keep a product out of the market, significantly impacting on revenue and return on investment.

Working with a certification or testing agency that has locally approved offices accepted by that government with branches in the manufacturer's own country can provide local staff to help manage the process and communications internally. If the manufacturer's current certification or testing agency has no office in the target country, it is likely that they may maintain a Mutual Recognition Agreement (MRA) with the primary compliance body in that country instead. These agreements enable one body to recognize the test reports or certificates of the other – so again test work may not have to be repeated.

Key Steps For Simplifying Testing & Certification

- Know where you want to export your product and check the market access requirements. If multiple markets with similar requirements can be identified, revenue opportunities can be increased.
- If you don't have an existing relationship with a test and certification laboratory, choose one that can offer you maximum market access, enable you to get the most from your investment, and quicken your time to market.
- Utilize all available sources of market access expertise – from senior colleagues, international trade teams at the embassies and your testing and certification partners to help you plan both local and global compliance strategy.
- Remember that testing and certification can be leveraged for more than just market access. You can also benefit from product differentiation, anti-counterfeiting activities, defense against accusations of liability and increased recognition and acceptance by retailers.
- When planning for market access, consider the market requirements beyond safety testing – including materials use, energy consumption, labeling and local import and distribution laws in your target market.



For more information on product testing and global certifications:

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