

**ELECTRICAL & ELECTRONICS
E&E SERVICES**



TRUSTED FOR REAL LIFE

**SAFETY, QUALITY AND SUSTAINABILITY SOLUTIONS
FOR THE ELECTRICAL & ELECTRONICS INDUSTRY**

SGS

BUILDING CONSUMER TRUST

Today's consumers demand safe, quality products with increasing levels of sustainability. From the food they eat and the clothes they wear to the toys in the nursery and the car they drive, they put their trust in you to reduce risk during production.



Partner with SGS for consumer goods and retail solutions to grow confidence and trust in your products and brand. Savvy shoppers have instant access to product data and consumer reviews. It only takes one product recall, one vocal customer/user group or one environmental mistake and your brand may never recover the confidence and trust you've worked so hard to build.

CREATING QUALITY ABOVE AND BEYOND EXPECTATIONS

Manufacturing and retailing is about more than simply producing and selling goods. You must meet regulatory standards covering consumer safety, environmental protection and resource conservation. To create products that are trusted for real life, you need the support of a third party testing, certification and verification partner. Trust our industry expertise coupled with decades of experience and the largest, best equipped network of offices and laboratories to support you grow your business.

THINKING SUSTAINABLY

Customers, consumers and stakeholders want you to demonstrate a commitment to sustainability too. Today, buying decisions are not just based on price and quality but also on a manufacturer's impact on the environment and community.

Work with our Sustainability experts to ensure that all aspects of your business are socially responsible. We also support you in measuring and monitoring your product's environmental impact over its entire life cycle with our Life Cycle Assessment, Sustainable Packaging Design and Carbon Footprint services, while our Hazardous Substance Management Services manage the risks that chemicals may pose to human health.

EVERYDAY PRODUCTS FOR EVERYDAY LIFE

With over 130 years experience our expertise reaches the broadest range of consumer goods:

- Automotive
- Cosmetics, Personal Care & Household
- DIY, Tools & Hardware
- Electrical & Electronics
- Food
- Home Furnishings & Housewares
- Medical Devices
- Packaging
- Sports & Outdoor
- Textiles & Footwear
- Toys & Juvenile Products

TRUSTED FOR REAL LIFE - WITH SGS

We are a leading independent third party service provider and offer efficient solutions to support safeguard quality, safety and sustainability throughout all stages of the global supply chain.

We can fulfil all your testing, certification, technical assistance, audit, inspection and verification needs. Our services can be employed either stand alone, or as part of an integrated package.

Our extensive resources and expert knowledge of the consumer goods and retail industry allow us to deliver outstanding value at every step in your project by providing:

- Rapid turnaround time
- Value-based pricing
- Technical assistance
- Key account management

ELECTRICAL & ELECTRONICS SERVICES

Electrical and electronic product manufacturers and retailers are under increasing pressure from clued up consumers who know about sustainability, energy efficiency and green issues. Partner with SGS to deliver well designed, desirable goods that are trusted for real life whilst ensuring quality, safety and sustainability for retailers and consumers.

SOLUTIONS

- Hazardous substances
- Product safety
- Functional safety
- EMC (Electromagnetic Compatibility Compliance)
- Audit & certification
- Performance & reliability
- Product inspection
- Sustainability (ErP - Energy related Products, Ecodesign, Energy Efficiency, PEP - Product Environmental Profile, etc.)

CLIENT SPECIFIC SOLUTIONS

- Retail programmes
- Technical assistance

NEW MARKETS AND PRODUCTS

- Electro medical devices
- Wireless devices & applications
- Micro & nanotechnology products
- Photovoltaic modules

COVERING ALL CONSUMER ELECTRONICS

- Household appliances
- Luminaries
- Batteries
- Power supplies
- IT & T
- Audio/Video equipment
- Power tools
- Automotive parts



TO YOUR ADVANTAGE

We identify the applicable regulations and standards for each of your specific products and target markets.

SGS can support you to reduce risk, improve efficiency and ensure compliance to contractual or regulatory requirements in all your manufacturing, sourcing, distribution and retailing operations.

THINKING SUSTAINABLY

Across our global network of sustainability experts we can support your company in its strategy by offering a range of services covering the environmental, safety and social aspects of sustainability:

- Restricted substances management
- Social responsibility solutions
- Ecodesign services

RETAILER BRAND SOLUTIONS

At every step of your project, we are committed to adding value to your work by providing rapid turnaround times, value-based pricing, cost effectiveness, technical assistance, key account management, local support, timely accurate reporting and pro-active feedback.

Avoid golden sample failures. Our expertise and services will give you reliable proof of quality and prepare you for consumer protection organisations that want to test your products.

Our comprehensive services support ensure that your products comply with regulations, standards and contractual specifications. This allows you to demonstrate due diligence at an early stage in your supply chain, reducing delays and enabling a faster time to market.

TESTS THAT WORK FOR YOU

A tailor-made performance testing programme from SGS may include:

PERFORMANCE TESTING

Performance testing includes a minimum of three tests:

- Functionality
- Handling
- Durability/endurance

SAFETY

- Surveillance screening
- Fault analysis
- Full compliance – against relevant legal requirements

EMC/R&TTE

- Pre-compliance
- Diagnostics
- Full compliance

FITNESS FOR USE (FFU)

Including: functionality, handling, durability, artwork (user manual, label rating, packaging)

RELEVANT INSPECTIONS

On production samples: During Production Inspection (DUPRO), Final Random Inspection (FRI), Loading supervision (optional).

BENCHMARKING

How does your product perform against your competitors'?

- Functionality
- Handling durability/endurance
- Quality

TECHNICAL DOCUMENT REVIEW

Ensure your paperwork is complete and up-to-date, save time and expense in the event of defects and warranty claims:

- Protocol service
- Technical file assessments





PRODUCT CATEGORIES

The types of products covered by our services include small and medium household products, such as:

- Kitchen appliances
- Personal care
- Audio/visual
- Lighting
- IT
- Power tools
- Toys

Large household goods, such as:

- Washing machines
- Refrigerators
- Dishwashers

OTHER RELATED SERVICES

Our portfolio of services is designed for retailers and importers. It includes consultancy services, CE seminars for EU Directives and IEC international standards, on-site staff training and individual awareness of new directives and regulations, including:

- RoHS II
- REACH/SVHC
- WEEE
- EuP/ErP
- Energy Efficiency

PRODUCT RECALLS

We cover this crucial topic for all retailers and importers through highly customisable services:

- Risk assessments
- Safety issues identification
- Workshops for product development

THE MARK OF SUCCESS

The SGS test mark is a quality mark you can trust. Successful applications are assured that the product meets all relevant quality requirements.

It allows you to demonstrate your commitment to product safety and assures the product's efficiency to consumers. Independent testing and validation demonstrates that a product meets, or exceeds, key purchasing criteria and gives your customers reassurance and peace of mind when choosing to buy.

No more golden sample failures and retailers have reliable proof that all products are the same quality as the initial samples.

ANOTHER KIND OF BENCHMARK

The Ecodesign Benchmark aims to provide designers with the metrics needed to include environmental requirements into new product design specifications. This service evaluates the environmental footprint of an existing product against another brand, in order to define good design practices. It can also be used to set minimum environmental performance targets.

The deliverable provides design teams with guidelines and technical design recommendations. These enable them to comply with environmental regulations, market requirements, industry standards and/or to develop products with a lower environmental footprint than other brands. All without increasing the unit cost, or compromising performance. The benchmark covers energy efficiency, mechanical parts, electronic design and packaging design. It also includes a screening life cycle assessment, a measurement of recyclability and the ease of dismantling for recyclers.

This is a pragmatic approach for designers to successfully implement Ecodesign into the product development process.

PRODUCT SAFETY

Certifications are mandatory in certain countries and for certain products. Voluntary certification schemes are also often required by retailers and/or consumers. To achieve certification and the associated certification mark, goods must undergo product testing and a production assessment.

WHY CERTIFICATION?

- Fast market access for your product
- Competitiveness in more markets
- Send a signal to potential clients that quality is your major focus
- Get higher ratings when you're evaluated by retailers & importers
- Improved reliability - market leading third party proof of product conformity

SGS offers certifications that support you gain a competitive advantage in the various markets in which you are interested.

The SGS Safety marks allow you to demonstrate that your product fulfils all relevant and applicable product safety requirements.

GET A PRICE BENEFIT

- Adapt the certification programme to your production development plan
- Eliminate design errors that can affect your reputation and market position
- Combined certification and audits - save management both time and money.

Our capabilities in product safety testing and certification, combined with our global accreditations allow us to offer you the most appropriate safety marks for your destination market(s).

You can see below a sample of SGS safety marks, as well as other national marks for which we support you.



SGS GS



SGS TÜV GS



SGS CEBEC



SGS Fimko



SGS North America



SGS Product Safety



SGS Bauart



SGS TÜV Bauart



CB Scheme



CE Marking



ENEC



HAR



Japan PSE



China CCC



Russia EAC



Korea KC



Australia RCM

EMC ELECTROMAGNETIC COMPATIBILITY



EMC - electrical products must be disturbance free and therefore electromagnetically compatible (EMC) with other E&E equipment. Consumer electronics should not introduce intolerable electromagnetic disturbances into the environment and should not be affected by such disturbances. Our EMC testing and certification services support you meet and exceed the requirements set by other national marks, including:



SGS EMC



China CCC



US FCC



CE Marking



CB Scheme



Taiwan BSMI



Japan VCCI



e/E mark



Russia EAC



Korea KC



Australia RCM

Canada ICES-003 Class B
Canada NMB-003 Classe B

Canada ICES

RoHS SERVICES



The RoHS directive restricts the use of six hazardous materials in E&E products that are “dependent on electric current or electromagnetic fields for at least one intended function”. Some product exclusions still apply. Since 2006, other countries, such as China, Korea, India, Japan, Vietnam and the US states of California and New Jersey, have also adopted RoHS-like requirements.

THE “HAZARDOUS” SUBSTANCES

RoHS is often referred to as the lead-free directive, but it restricts the use of these six substances including other heavy metals and two flame retardants:

- Lead
- Mercury
- Cadmium
- Hexavalent chromium
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ether (PBDE)

The maximum permitted concentration limits are established by weight of homogenous material - for example, the insulation in an electrical cable or the solder on a component lead.

ROHS II

The EU Directive 2002/95/EC Restriction of Hazardous Substances (RoHS) has been in effect since July 1, 2006 and was revised in 2011. The changes in Directive 2011/65/EU, also known as “RoHS II” will slowly take effect over six years. Selected examples of major changes in the new directive are:

- RoHS is now a CE marking directive
- Expanded product scope including medical devices, monitoring and control equipment and
- Four year maximum validity of exemptions, with the possibility of extension
- New “obligations” for importers, manufacturers and distributors

YOUR BENEFITS

SGS has over 28 accredited RoHS laboratories worldwide and 1,000 specialists in this field, providing E&E industries with the requisite, independent data to achieve RoHS compliance. Some of the RoHS - related services we provide include:

- Product risk assessments
- Process gap analysis and consulting
- Full product and material testing to IEC 62321 standards
- XRF screening
- SGS RoHS Certificate of Conformity (CoC)
- Verification services
- Training

RELATED ENVIRONMENTAL PRODUCT SERVICES

- WEEE services
- REACH/SVHC
- PEP (Product Environmental Passport)
- Verification services
- Green inspection services
- Related chemical tests
- IECEE HS reporting services
- Ecodesign
- Life Cycle Assessment (LCA)
- ErP - Energy related Product services
- Ecodesign training
- Carbon footprint marks
- etc

PRODUCT INSPECTION

Peace of mind - always.

Proactive problem identification and solution implementation are essential to the success of any company. SGS provides an answer to both and offers much more.

PROVIDING ASSURANCE

Our Quality Assurance Programme (QAP) ensures there is no flaw in a product's design and that the production and delivery systems are functioning efficiently. Through product evaluation, factory assessment, product inspection, and shipment control, QAP enables manufacturers to identify potential production pitfalls, allowing for a faster time-to-market.

BRINGING IMPROVEMENTS

It is one thing to identify a problem and another to effectively solve it. While the QAP will identify effective ways to improve product quality, through the Quality Improvement Programme (QIP), we will assume responsibility for implementing the solutions. QIP allows us to become deeply involved in the entire process and to give you increased control over product design and quality. In addition to QIP and QAP, we provide comprehensive individual customer modules, to ensure all your inspection needs are being met.

YOUR BENEFITS

Our QAP & QIP services support manufacturers to:

- Create/maintain a high-end and high-value product line
- Develop a strong concept of quality
- Assess factory capability
- Create strong relationships with suppliers in the long-term
- Discover causes of non-conformity and prevent them from occurring
- Mitigate other potential risks and avoid product recalls
- Achieve a faster time-to-market

Our Product Inspection services give you access to:

- A large network of inspectors and auditors worldwide
- Experience (we perform thousands of inspections & audits every year)
- Fast processing/fewer delays
- Widely recognised reports
- Risk protection



WIRELESS

We are your independent, experienced global partner in testing & certification for the wireless industry.

TRUSTED PARTNER

Our wireless experts are active members and contributors to:

- GCF – Global Certification Forum
- PTCRB – PCS Type Certification Review Board
- PVG – PCS Validation Group
- OMA – Open Mobile Alliance
- CTIA – Cellular, Telecom and Internet Association

WIRELESS SERVICES

We operate accredited testing labs providing wireless network systems such as radio base stations, broadband access multiplexers (DSLAM), switches or routers the following services:

- Product safety assessment
- EMC testing
- Product reliability assessment (Climatic, Vibration, Earthquake, HALT)
- Air interface testing for radio base stations
- Signalling protocol conformity verification (SIP, SIGTRAN, CCS)
- Pre-compliance testing
- Product design support
- On-site testing
- Test system development
- Notified body
- Compliance management & consultancy
- Thermal simulation
- System certification

MOBILE SERVICES

The SGS E&E service portfolio for cellular mobile terminal manufacturers/multipliers includes:

- RF & Protocol conformance testing
- GSM/GPRS/EDGE/AMR/UMTS/HSDPA/CDMA/EVDO/LTE
- Bluetooth qualification testing
- Wi-Fi
- Environment reliability testing
- Validation service
- Field testing (IOT)
- SAR testing
- Health & safety testing
- EU R&TTE test services
- EMC testing
- OTA testing
- Consultancy services
- Client rooms
- International certification schemes
- Near Field Communications (NFC)
- Wireless Power Consortium (WPC)
- Acoustics and more

WHY SGS?

We maintain a highly experienced team of engineers who play an active role in multiple standard boards and are members of various industry groups.

We provide comprehensive testing solutions for telecom products through its network of state-of-the-art labs:

- Mobile phone laboratory
- Bluetooth laboratory
- Wi-Fi laboratory
- Network system laboratory
- Safety & EMC laboratory
- Environment reliability laboratory

All our labs are ISO 17025/GCF/PTCRB/CTIA accredited and are strategically located in:

- Asia (Taiwan & Korea)
- US (California & Kansas)

BATTERY SERVICES



Make sure your customers' first impression of your private label batteries is a lasting one. SGS can provide battery comparison testing against national and international standards. We can also provide side by side comparison data and continued validation to make supplier selection an easy task.

ENHANCE QUALITY THROUGHOUT YOUR SUPPLY CHAIN

Need third party verification of packaging, labelling and certifications? Let us manage your supply chain. SGS offers the following services related to batteries:

- ANSI C18.1M-1, C18.2M-1 and C18.3M-1 Performance testing
- IEC 61960-1 Performance testing
- Battery Directive 2006/66/EC Hazardous substance analysis and Capacity
- Third party verification of packaging, labelling and certifications
- Client defined profiles such as device specific and capacity at various temperatures

LITHIUM-ION BATTERIES

One of the advantages of Lithium-ion batteries is their ability to provide longer operation times, when compared to other battery chemistries. This capability can also raise concerns when it comes to safety. Lithium-ion batteries are more likely to present dangers to the customer when mishandled, or not properly manufactured. Two of the primary risks to customers could be battery fire and explosion.

LITHIUM-ION SAFETY TESTING

We offer the following safety testing services related to Lithium-ion batteries:

- ANSI C18.3M-2 Safety testing
- IEC 62133, IEC 60086-X Safety testing for CB Scheme Certification
- UL 1642 Lithium cell safety testing
- UL 2054 Battery safety testing
- IEEE 1725 Battery safety in cellular phones
- IEEE 1625 Battery safety in mobile computing devices (laptop and netbook)
- CB Scheme Certification

To support you address battery safety concerns, we offer safety testing and factory auditing services to ensure your merchandise meets industry accepted criteria. We can also support you specify continued compliance sampling to capture any changes to the qualification lot.



SGS North America



SGS GS



CB Scheme



Taiwan BSMI

PERFORMANCE & RELIABILITY TESTING

Are you sure your products are as good as you think they are?

PERFORMANCE

Performance is related to ensuring a product actually works as well as promised. Performance testing is not related to any directives and in most cases it is performed at the end of the product development stage, after all safety, EMC or chemical tests have been done. It's a comprehensive survey, which entails verifying all relevant test protocols and certificates and creating the required Technical Construction File (TCF).

YOUR BENEFITS

- Find out the real capacity of your product
- Get a quality mark from SGS
- Benchmark information to compare with your competitors

RELIABILITY

Reliability is the ability of an object to perform a required function under given conditions for a given time frame. Reliability testing ensures a product works as expected under normal and extreme conditions.

Such measurements enable manufacturers and retailers to estimate a product's life span and identify weaknesses that might lead to the product's failure.

YOUR BENEFITS

- Lower costs associated with in warranty and after sale product failures
- Higher brand recognition and increased consumer trust in your product



ELECTRO MEDICAL DEVICES

Achieving a fast time to market requires comprehensive regulatory knowledge and a flexible approach in establishing the most suited assessment procedure. With specific combinations of tests and audits you can ensure compliance with requirements of multiple certifications at the same time.



TESTING

Our testing portfolio includes:

- **EU/INTERNATIONAL PRODUCT SAFETY**, including testing to the IEC/EN 60601 and IEC/EN 61010 series and the CB scheme that covers testing requirements of over 52 countries
- **US NRTL** (UL & AAMI Standards) and **STANDARDS COUNCIL OF CANADA** (CSA Standards)
- **EMC TESTING** (IEC/EN 60601-1-2, and IEC/EN 61326 series including CB Scheme)
- Approval for **OVERLAPPING EC DIRECTIVES**: Machinery Directive; Personal Protective Equipment; Pressure Equipment; Non Automatic Weighing Equipment; R&TTE
- **FUNCTIONAL SAFETY**
- **WIRELESS TESTING/TELEMEDICINE**
- **BATTERIES**, testing to IEC 62133 for secondary cells and batteries containing alkaline or other non-acid electrolytes, and to IEC 60086-4 for lithium primary batteries.
- **RESTRICTED SUBSTANCE TESTING**, including testing to RoHS2 requirements for Medical Devices
- **PACKAGING TESTING**
- **USABILITY**

CERTIFICATION

Our range of regulatory and quality audit and certification services cover the following requirements:

- **ISO 13485**
- **ISO 9001** and **ISO 14001**
- **93/42/EEC** as amended by 2007/47/EC (Medical Devices Directive, CE Marking for Europe)
- **98/79/EC** (In Vitro Diagnostic Medical Device Directive, CE Marking for Europe)
- **CMDCAS** (Canadian Medical Devices Regulations)
- **510(k) SUPPORT SERVICES** for test data, advisory, and factory follow-up
- **U.S. Food & Drug Administration (FDA) SITE INSPECTIONS**
- **JPAL** (Japanese Regulations for Medical Devices)
- **OTHER EC DIRECTIVES** (CE marking of PPE, Pressure Vessels, NAWI and more)
- Global Regulatory Certifications, including third party certifications for Taiwan, Australia, Hong Kong and Brazil (INMETRO)

AND MUCH MORE

Other services related to medical devices include:

- **BIOCOMPATIBILITY EVALUATION**
Biological evaluation of medical devices according to ISO 10993
- **AUDITS** - Supplier Audits, Gap Analysis Audits and Pharmaceutical and Cosmetic GMP Audits
- **CLINICAL TRIALS**
- **HYGIENIC QUALIFICATION** of production facilities
- **MICROBIOLOGICAL TESTS OF PRODUCTS** before and after sterilization
- **PRODUCT CONTROL FOR POSSIBLE TOXIC RESIDUES** from the sterilization process
- **TRAINING**, including QMS/Auditing (ISO 13485; internal auditing), Global Regulations (CE marking, FDA, JPAL), Sterilization (Radiation, Ethylene Oxide, Steam), Risk Management (ISO 14971) and Product Safety & EMC (the IEC 60601 series), including Functional Safety
- **SOFTWARE** and **CYBERSECURITY ANALYSIS**
- **MULTIFUNCTIONALITY** and **SIMULATION EVALUATIONS**

MICROELECTRONICS

SGS' microelectronics division focuses specifically on areas that use micro or nanostructures and thin film technologies.

HIGH-TECH ANALYSIS AT A DIFFERENT SCALE

The microelectronics division of SGS Institut Fresenius is the leading provider of analytical services for the semiconductor industry and its components suppliers. The microelectronics division focuses specifically on areas that use micro or nanostructures and thin film technologies.

Our key knowledge of materials, surfaces and layers enables us to support our customers through individualised chemical and physical analyses throughout all value added chain phases, from product and technology development to processes control and final products.

SPECTRUM OF CAPABILITIES

We support you in:

- Research and development
- Quality control
- Environmental simulation
- Root cause analysis of failures and damages
- Lab outsourcing solutions

By means of:

- Process media and auxiliary materials testing
- Trace and dopant analysis
- Surface and thin film analysis
- Analysis for back-end of line
- Analysis for electronic packaging and assembly



SGS is the world's leading inspection, verification, testing and certification company.

Recognised as the global benchmark for quality and integrity, we employ 90,000 people and operate a network of more than 2,000 offices and laboratories around the world.

We identify the applicable regulations and standards for each of your specific product and target markets. We support you reduce risk, improve efficiency and ensure compliance to contractual or regulatory requirements in all your manufacturing, sourcing, distribution and retailing operations.

As you consider your company's compliance challenges, let SGS support you to make the best decisions for your business.

To keep abreast of the developments reshaping your industry sector, subscribe to our free publications at: www.sgs.com/consumersubscribe.sus



CONTACT US

SGS is your global partner to provide you with tailored services and consulting solutions that meet your needs, objectives and budget.

For more information on how our E&E services support you, visit us at www.sgs.com/ee or contact us at ee.global@sgs.com.

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WHEN YOU NEED TO BE SURE

