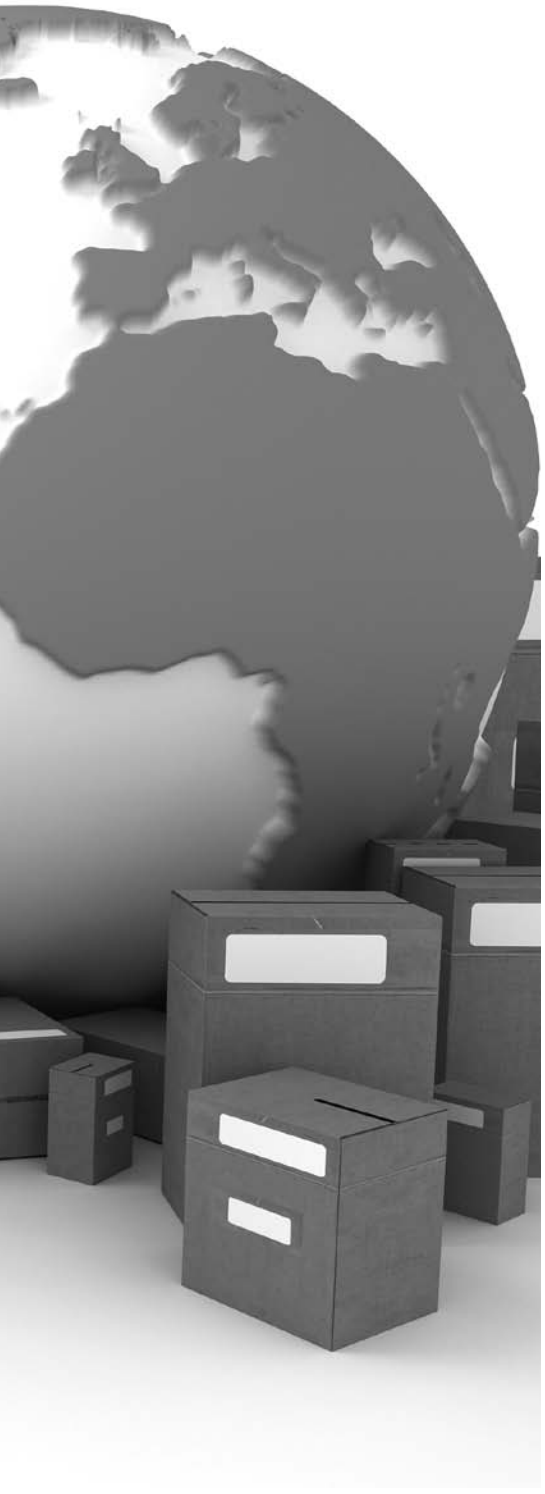
HAVE YOU CONSIDERED TESTING YOUR PACKAGING ?

HAVE COMPLETE CONFIDENCE IN YOUR PACKAGING



As the first contact with the consumer, packaging is key to a product's commercial success, but there are technical, regulatory, economic, marketing and environmental factors to consider.

Dealing with all these factors within ever-decreasing lead times is a real challenge, and it is therefore essential to adopt an appropriate approach from the design stage.

On the strength of its experience, SGS delivers answers to your concerns about eco-design, cost reduction, regulatory compliance, REACH, labelling, product safety, etc.

Our expertise covers all types of packaging materials – paper, corrugated cardboard, flexible and rigid plastic, textiles, metal, glass, ceramics, silicon and other similar products.

In addition, our staff are used to working with industries facing a range of issues – food processing, cosmetics, pharmaceuticals, electrical and electronic, DIY and gardening, luxury goods, medical devices, sports and leisure, and so on.

REDUCE PACKAGING-RELATED RISKS

Physical defects, product deterioration following migration between contents and container, product oxidation following sealing or permeability problems, the presence of heavy metals and labelling errors; to measure such risks, SGS makes use of its special expertise and equipment. We test your packaging under all usage, storage and transport conditions, using test benches and simulation chambers to test vibrations, impacts, compression, temperature, humidity, etc.

Our broad spectrum of tests enables us to evaluate the physical performance and chemical properties of your primary, secondary and tertiary packaging (a complete, full shipping container). Our comprehensive service range matches the tests most frequently requested.

WE CONDUCT TESTS IN COMPLIANCE WITH PACKAGING-RELATED RULES AND REGULATIONS

- Regulation no. 10/2011 on plastic materials and articles intended to come into contact with food
- Food contact tests in line with American regulations (FDA 21 CFR 175, FDA 21 CFR 177, etc.) and those in China (GB standards)
- Information notice no. 2004/64 from the DGCCRF (French Directorate General for Competition, Consumer Affairs and Prevention of Fraud) on materials other than plastics in contact with foodstuffs
- CSHPF (French public health authority) notice of 7 November 1995 on the use of ink and varnish to print packaging intended for contact with food
- BPA regulations in French law no. 2012-1442 of 24 December 2012
- Directive 2005/20/EC (amending Directive 94/62/EC) on packaging and packaging waste
- Regulation (EC) No. 1223/2009 on cosmetics
- Regulation (EC) No. 1907/2006 of 18 December 2006 on REACH
- Testing following the American (USP 36 <671> and <661>), European and Japanese pharmacopoeias
- French standard NF EN ISO 11607-1 on packaging for terminally sterilised medical devices
- CLP Regulation (EC) No. 1272/2008 on the classification, labelling and packaging of substances and mixtures

HAVE YOUR PACKAGING CHECKED GAIN TANGIBLE BENEFITS

- Comply with regulations
- Protect your products
- Reduce losses throughout the product's life
- Keep control over costs (products and transport)
- Evaluate the environmental impact related to your products' design, manufacture and distribution
- Reduce the development time for your packaging and increase trust in the product/packaging combination
- Improve your customers' satisfaction and your image

THE SGS ADDED VALUE

GLOBAL NETWORK. SGS is the world's leading inspection, verification, testing and certification company. Recognised as the benchmark in terms of quality and integrity, SGS maintains a network of over 80,000 employees in more than 1,650 offices and laboratories around the world. **GLOBAL EXPERTISE.** In addition to laboratory testing and analysis services, SGS makes use of the technical expertise of its global network to offer appropriate add-on services throughout your products' lifecycle, with technical and regulatory advice, investigations into defective products, training, checking of environmental complaints, certification, etc. **INDEPENDANT AND MANY ACCREDITATIONS ORGANIZATION.** SGS has a great many accreditations in checking the standards' compliance of your packaging, such as ISTA, TAPPI, ASTM, ISO, ANSI, National Motor Freight, Uniform Freight, UN/DOT, IATA, ICAO, IMDG, NF EN BS, and so on.

A COMPREHENSIVE PACK OF SGS SERVICES

CONTENTS COMPLIANCE

Container/contents interaction – Suitability for food contact

Packaging must not impair the product and must meet the requirements of Regulation no. 10/2011 and the DGCCRF's information notice 2004-64 on materials and articles intended to come into contact with food.
SGS conducts tests on suitability for food contact pursuant to European, American (FDA 21 CFR) and Chinese (GB standards) regulations and the standards in force for various materials, such as plastic, paper, glass, metal, plant matter, etc.

- Overall migrations in aqueous simulant (10% ethanol, 20% ethanol, 50% ethanol and 3% acetic acid) and oil simulant (vegetable oil)
- Specific migrations such as PCPs, PCBs, phthalates, BPA, aromatic amines, residual solvents, heavy metals, etc.

These tests are conducted under our COFRAC (French Accreditation Committee) accreditation*.

Regulation (EC) No. 1223/2009 on cosmetics stipulates that the safety report must include information about the packaging material and its interaction with the product. SGS meets this requirement, conducts general and specific migration tests, and identifies and quantifies SVHC and heavy metals.

TOXICITY CHECKS

Concentration of specific molecules

SGS offers the following tests for the presence or otherwise of toxic compounds:

- Erucamide concentration (slip agent)
- Volatile Organic Compounds (VOCs) concentrations
- Polycyclic Aromatic Hydrocarbon concentrations (PAHs) in plastics
- Concentrations of SVHC (substances of very high concern – REACH regulations)
- Phthalate, BPA, etc. content
- Formaldehyde content
- Cadmium content

TESTS ON PLASTICS

Characterization and composition

- Materials identification (FTIR)
- Materials composition (qualitative and quantitative analysis of organic and mineral compounds)
- Thermal analyses: DSC (fusion enthalpy, glass transition and crystallinity level), ash content, Vicat softening point, MFI (Melt Flow Index)
- Density
- HDT (heat distortion temperature)
- Pollutant testing (MEB, ICP, GC-SM, etc.)

EXAMPLE
COSMETICS SECTOR

- Container/content interaction pursuant to Regulation (EC) No. 1223/2009
- Pump checks following internal benchmarks:
  - Concentration and flow rate
  - Solidity of assembly
  - Seal effectiveness
  - Oxidation of springs and ball bearings
- Resistance of metal coverings to spray as per ISO 9227
- Resistance in bathroom conditions as per ISO 6270-2
- Rubbing away of markings and wording as per NF EN 60068-2-70
- Suntest photo-ageing to check yellowing as per ASTM D1925

ASPECT EVALUATION

Appearance testing

The packaging's appearance is as important during the act of purchase, as it is at the various stages of packing, transport and usage. SGS tests a packaging's aspect following internal or standardised methods.

- Size and volume measurements
- Optical microscopy and smartscope (contactless 3D) thickness measurement
- Grammage (paper density)
- Surface tension/energy - wettability to check ink adhesion
- Resistance to rubbing and wear through contact (crockmeter)
- Taber abrasion test, and Taber and Erichsen scratch resistance
- Fluid compatibility – Stress - cracking (Staining (alkaline and acid sweat, grease, water, etc.)
- Light transmission / turbidity (correlated haze)
- Gloss / Colorimetry / Grey scale

ROBUSTNESS OF THE PACKAGING

Mechanical Characterization

These tests make it possible to evaluate the resistance of packaging materials when subject to various physical stresses. They accordingly reveal defects arising over time. SGS offers various tests:

- Tensile test at ambient temperature or under hot or cold conditions up to 100 kN
- Compression test (vertical compression resistance) and bending test
- Resilience test: Charpy / Izod impact test
- Weld strength and peel tests at 90° and 180° C
- Elmendorf tear and trouser tear tests
- Perforation resistance (dart impact test, multi-axial impact test)
- Opening and closing strength
- Screwing and unscrewing torque
- Determination of the dynamic and static friction coefficients (sliding coefficient of a plastic film or paper/cardboard)
- Fatigue tests in tensile, compression and bend up to 50 kN and 30 Hz, depending on the movement in question
- Pomp robustness and flow rate tests

RESISTANCE TO AGEING FACTORS

Resistance to climatic and UV ageing and corrosion

To ensure that packaging plays its protective role and the product remains in perfect condition, SGS offers procedures assessing conformance against physical hazards (heat, cold), UV and chemical hazards (humidity, corrosion, etc.)

- Corrosion test (neutral, acetic acid, and copper accelerated salt spray tests)
- Tests of reactions to water, to assess resistance in environments such as bathrooms (sealed against condensation)
- Accelerated weather ageing test to check the lifespan of the product/packaging combination
- UV photo-ageing tests (Suntest/ Q-Sun, Xenotest, WOM/Ci35, UV-CON/Q-UV, Climatron/XR35) to simulate exposure behind a shop window in direct sunlight or a display cabinet, and assess the reaction of materials, decorations and printing. Tests conducted under our COFRAC (French Accreditation Committee) accreditation*.

EXAMPLE
MEDICAL SECTOR

- Weld strength check as per NF EN ISO 11607-1
  - Peeling as per EN 868-5 (Appendices D and E)
  - Seal effectiveness as per ASTM F1929 and ASTM D3078
  - Accelerated ageing as per ASTM F1980
  - Transport simulation as per ASTM D4169 and ISTA3A
- Water vapour permeability and light transmission tests as per USP 36 <671>

RESISTANCE TO LOGISTICAL STRESS FACTORS

Transport test

During transport, packaging (pallets, cases, cardboard boxes, films, etc.) is subject to various stress factors (storage, handling, atmospheric conditions, etc.) that SGS is able to simulate in its laboratories.

SGS evaluates the risks of breakage and distortion by simulating various distribution circuits (road, rail and air), following national and international standards (ISTA, ASTM and ISO):

- Specific packing to suit the transport conditions (desert, tropics, refrigerated storage, etc.)
- Free-fall and vibration impact tests
- Localised impact tests
- Fixed low frequency and random vibration tests
- Tests in low-pressure chamber to simulate air transport
- Compression tests (simulating stacking)

PRODUCTS' STATE OF PRESERVATION

Permeability and seal effectiveness

Permeability tests (accredited COFRAC tests*) used to check the lifespan of a product inside its packaging:

- Water vapour permeability test
- Oxygen permeability test
- Grease permeability test

Seal effectiveness tests to ensure the packaging preserves the contents:

- Seal effectiveness in an explosion-proof oven
- Seal effectiveness in a vacuum chamber
- Seal effectiveness with leak detectors
- Bubble test
- Integrity / dye penetration test
- Penetration index (PI)

CONSUMER PERCEPTION

Sensory testing and consumer panels

- Assessment of packaging positioning on several criteria – touch, ergonomics, usage, environmental perception, using mini-panels
- Checking the sales message is properly perceived in the midst of the statutory labelling, and confirmation of your customers' satisfaction – use of a blind panel
- Assessment of the changes to food flavours caused by packaging: sensory test (smell, taste, feel) on plastics and paper/cardboard (Robinson test) conducted with expert panellists held daily in COFRAC-accredited* air-conditioned rooms (8 rating cabins, separate preparation room)

EXAMPLE
FOOD PROCESSING SECTOR

- Overall and specific migrations as per Regulation (EU) No. 10-2011, the DGCCRF (French Directorate General for Competition, Consumer Affairs and Prevention of Fraud) notice 2004-64 and the FDA 21 CFR regulation
- Water vapour permeability test as per ISO 2528 or ASTM E96
- Oxygen permeability test as per ASTM D3985 or ASTM F2622
- Odour and taste tests as per ISO 13302 to check for any alteration to the flavour of food
- Non-instrumented (dart test) as per ISO 7765-1 and instrumented (multi-axial impact) as per ISO 7765-2 puncture tests
- UV resistance test as per ISO 4892-2

EXAMPLE
INDUSTRIAL SECTOR

- Compression simulation as per NF EN ISO 12048 or ASTM D642
- Effects of high altitude during air transport as per ISO 2873 or ASTM D6653
- Seal effectiveness measured by penetration index as per NF EN 60529
- Random vibration test to simulate road or rail transport as per ISO 13355 or ASTM D4728
- Drop test to reproduce problems related to good handling as per NF EN ISO 22248 or ASTM D5276
- Weather phenomena simulation (desert, tropical, refrigerated) as per ISO 2233 or ASTM D4332

ENVIRONMENTAL FRIENDLINESS AND GREEN DESIGN

Biodegradability

Testing the biodegradability rate of a material under various conditions (composting)

- Identifying and checking the concentration of bio-sourced content in a product or raw material
- Eco-design assessment of product-related packaging
- Simplified and detailed lifecycle analysis for materials and packaging
- Carbon footprint
- Checking for heavy metals as per Directive 94/62/EC

On the strength of its experience, SGS is in a position to create suitable tools in response to varied issues.

APPROVAL OF SPECIAL PACKAGING

Compliance with packaging specifications

- Approval of packaging for infectious medical waste pursuant to French standards NF X30-500, NF X30-501, NF X30-505 and NF X30-506
- Approval of sterile barrier packaging pursuant to NF EN ISO 11607-1
- Approval of Big-Bags pursuant to NF EN ISO 21898
- Approval of adhesive labels in line with FINAT's standards – marking, traceability and sealing labels for shipping cases
- Approval of plastics pursuant to various pharmacopoeias – European (PE), American (USP) and Japanese (JP)

CERTIFICATIONS / AUDITS / INSPECTIONS / REGULATORY REVIEWS

Certification

Certification of services is used to attest that service commitments made to customers are measured against a benchmark, and approved in conjunction with industry professionals, users and government. Certification is voluntary, and can give businesses a competitive advantage. SGS therefore suggests you avail yourself of this advantage by certifying your sites and products.

Supplier audits

Choosing the right supplier is an important step for a lasting and successful business relationship. Auditing your suppliers' plants will allow you to verify their ability to meet their contractual obligations in terms of safety, quality, performance, quantity and lead time. SGS adapts audits according to your specific needs.

Inspection

During inspections, our experts examine the properties of products and their technical and regulatory compliance (with local and international regulations alike). This step enables you to identify goods, check their quality, reduce the risk of refusal of entry to a country, and detect any possible discrepancies between the order and the delivery. In addition, the SGS brand protection programme helps you secure authorised supply channels and guarantee the authenticity of your products.

Regulatory review

SGS is in a position to offer you regulatory (risk assessment) and technical assistance (production and approval of safety data sheets), as well as training (REACH, food contact, etc.)

CONTACT

t. 04 42 97 72 32
fr.emballage@sgs.com
www.sgs.com

* COFRAC (French Accreditation Committee) accreditations:
Accreditation No. 1-0109, Tests, scope available on www.cofrac.fr: Testing and analysis of materials in contact with food (Programme 79)
Accreditation No. 1-1526, Tests, scope available on www.cofrac.fr: Permeability testing of polymer-based films and packaging materials (Programme HP-EMP)

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WHEN YOU NEED TO BE SURE

SGS