Extractables & Leachables Services

Health Inspired,
Quality Driven.

SGS

Why do E&L Testing?

Extractables & Leachables studies enable drug and device sponsors to quantify and identify the risks of potentially toxic leachable impurities migrating into a drug solution or patients from container closure systems, processing equipment or medical devices. Regulatory bodies such as the US Food and Drug Administration (FDA) and The European Medicines Agency (EMA) are increasingly focusing on the E&L concerns from various manufacturing components (such as single use systems), medical devices and container-closure systems.

The FDA has stated in its packaging guideline from 1999 that "Drug product containers and closures shall not be reactive, additive, or absorptive so as to alter the safety, identity, strength, quality or purity of the drug beyond the official or established requirements." Consequently, extractables and leachables (E&L) studies are crucial component of product release. Before beginning an extractables and leachables study it is important to determine the leachables risk associated with a particular product. This risk will be dependent on two major factors: route of administration and likelihood of a packaging component-dosage form interaction. Leachables that migrate into pharmaceutical products from the manufacturing and packaging system are required to be identified and monitored.

The ISO 10993 series of standards are used by medical device manufacturers for the evaluation of biological safety, more commonly referred to as biocompatibility combined with chemical characterization (part 18) and toxicological safety (part 17) assessment. An important step in this process is the chemical characterization of the material and identification of chemicals that can migrate or extract from the polymer components of the medical devices.

Comprehensive testing for Extractables and Leachables in:

- Container materials / Packaging
- Single-use Systems (SUS)
- Medical Devices

SGS Health Science

SGS Health Science enables the medical and health innovators of the world to deliver life-changing solutions in the quickest, safest and most efficient way, helping improve the lives of many. We provide the highest quality services, reliable expertise and guidance through our network of laboratories conveniently located around the globe.

Quality & Compliance Challenges

Growing regulatory requirements & scrutiny

Packaging and production changes require assessment of change impact

Regulators want assays & analytical data used to design bioprocess scale-up through development from beginning stages

Packaging concerns for common classes of Drug Products

DEGREE OF CONCERN ASSOCIATED WITH THE ROUTE OF ADMINISTRATION	LIKELIHOOD OF PACKAGING COMPONENT-DOSAGE FORM INTERACTION		
	HIGH	MEDIUM	LOW
HIGHEST	Inhalation Aerosols and Sprays;	Injections and Injectable Suspension; Inhalation Solutions;	Sterile Powers and Powders for Injection; Inhalation Powders
HIGH	Transdermal Ointments and Patches;	Ophthalmic Solutions and Suspensions; Nasal Aerosols and Sprays	---
LOW	Topical Solutions and Suspensions; Topical and Lingual Aerosols; Oral Solutions and Suspensions	---	Oral Tablets and Oral Capsules; Topical Powders; Oral Powders

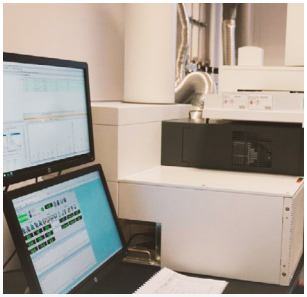
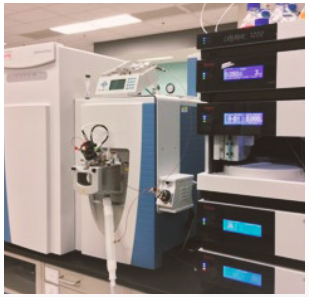
Why test with SGS?

SGS is an expert in meeting regulatory compliance

Analytical reports ready for submission

Reliable & accurate testing using state-of-the-art facilities, equipment & techniques

Analytical Techniques for E&L Testing

Volatile Organic Compound (VOC)	Semi-Volatile Organic Compound (SVOC)	Non-Volatile Organic Compound (NVOC)	Elemental Impurities
			
Thermo GC-Q Exactive HRMS Instrument or equivalent	Agilent GC-QTOF 7250 HRMS or equivalent	Thermo UPLC Q-Exactive HRMS instrument or equivalent	Agilent ICP-MS 7800 or equivalent

E&L Services

- Extractables on Container Closure Systems (Glass vials with rubber stoppers, prefilled syringes, IV plastic bags, plastic bottles with caps, tubes, transdermal patches)
- Extractables on Secondary Packaging (Pouches, label, ink migration, etc.)
- Extractables on Single Use Systems and Multiple Use Systems (Bioprocess bags, tubing, connectors, filters, gaskets, etc.)
- Leachables Screening
- Leachables Method Development & Validation
- Leachables Stability Studies
- Impurity Unknown Identification
- Toxicological ReportsAssessment
- Consultancy E&L Strategies

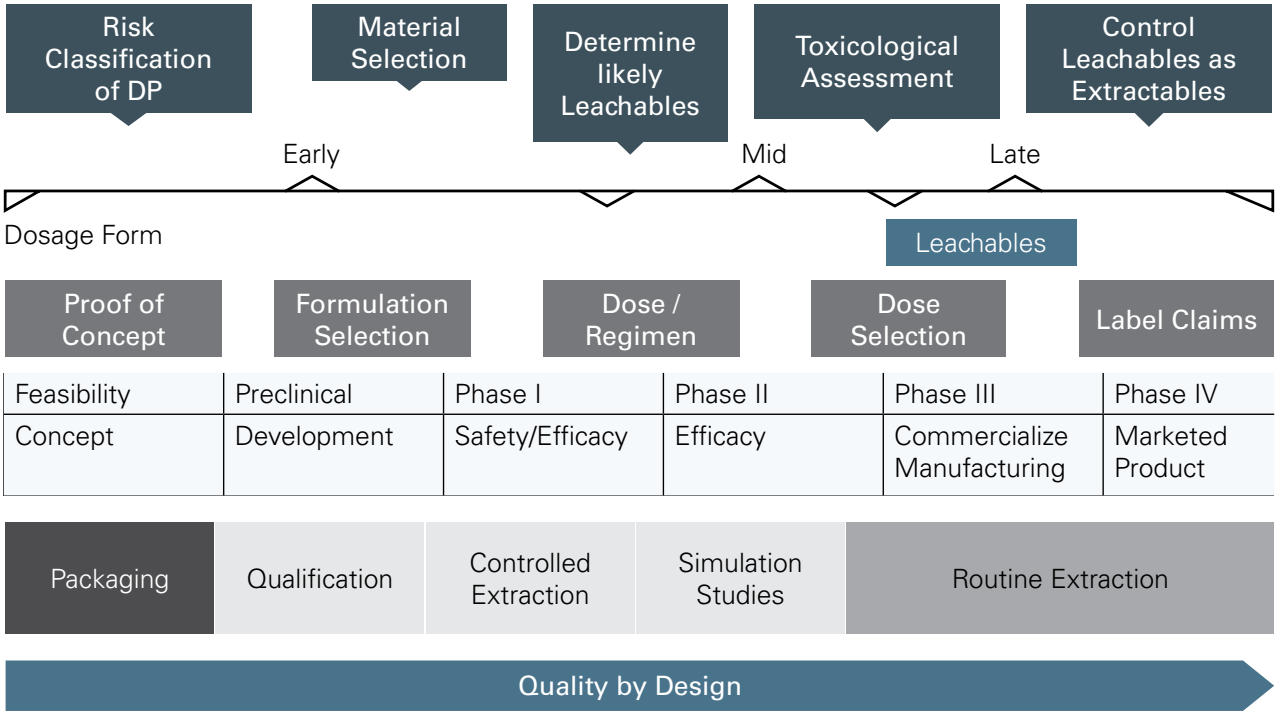
E&L Project Turn Around Time (TAT)

- Extractables Study
  - 8-10 weeks for extraction, analysis & reports
  - 4 to 6 weeks with rush fee applied
- Toxicology Review
  - 2 to 4 weeks
- Leachable Screening/Simulation Study (Optional)
  - 8-10 weeks for sample preparation, analysis & reports
  - 4 to 6 weeks with rush fee applied

- Method Development and Validation for Target Leachables (Optional)
  - 10 to 12 weeks/method (multiple methods can be done in parallel)
- Leachables Stability using Validated Method (Optional)
  - 2 to 4 weeks after receiving stability samples (routine testing)

Milestone of an Extractables and Leachables Assessment

Project Preparation		Experimental Phase	
Preliminary Work	**Risk Assessment**	**Extractable Study**	**Leachable Study**
• Execute CDA/MSA • Collect information from suppliers, chemical compatibility of materials, food compliance certificates • Assess supply chain e.g. knowledge on changes, modifications • Rank, prioritize and bracket different materials	• Evaluate overall process and risk e.g. ICH Q8 /Q9 / Q10 / Q11 tools) • Select materials • Study overall project protocol • Define project milestones	• Execute protocols for extractables testing • Identify extractables • Evaluate results • Generate report • Define preliminary specification limits for leachable study: toxicological assessment	• Conduct method development and validation, combined with screening and product specific validation • Leachable study with evaluation and report • Final risk assessment • Change control • Risk control strategies


Risk Classification of DP
Material Selection
Determine likely Leachables
Toxicological Assessment
Control Leachables as Extractables
Early
Mid
Late
Dosage Form
Leachables
Proof of Concept
Formulation Selection
Dose / Regimen
Dose Selection
Label Claims
Feasibility
Preclinical
Phase I
Phase II
Phase III
Phase IV
Concept
Development
Safety/Efficacy
Efficacy
Commercialize Manufacturing
Marketed Product
Packaging
Qualification
Controlled Extraction
Simulation Studies
Routine Extraction
Quality by Design

Get to Market Quickly, Safely & Efficiently

We provide the highest quality services, reliable expertise and guidance through our network of laboratories conveniently located around the globe.

DISEASE

PRE-CLINICAL

MARKET

CURING

DISCOVERY

CLINICAL

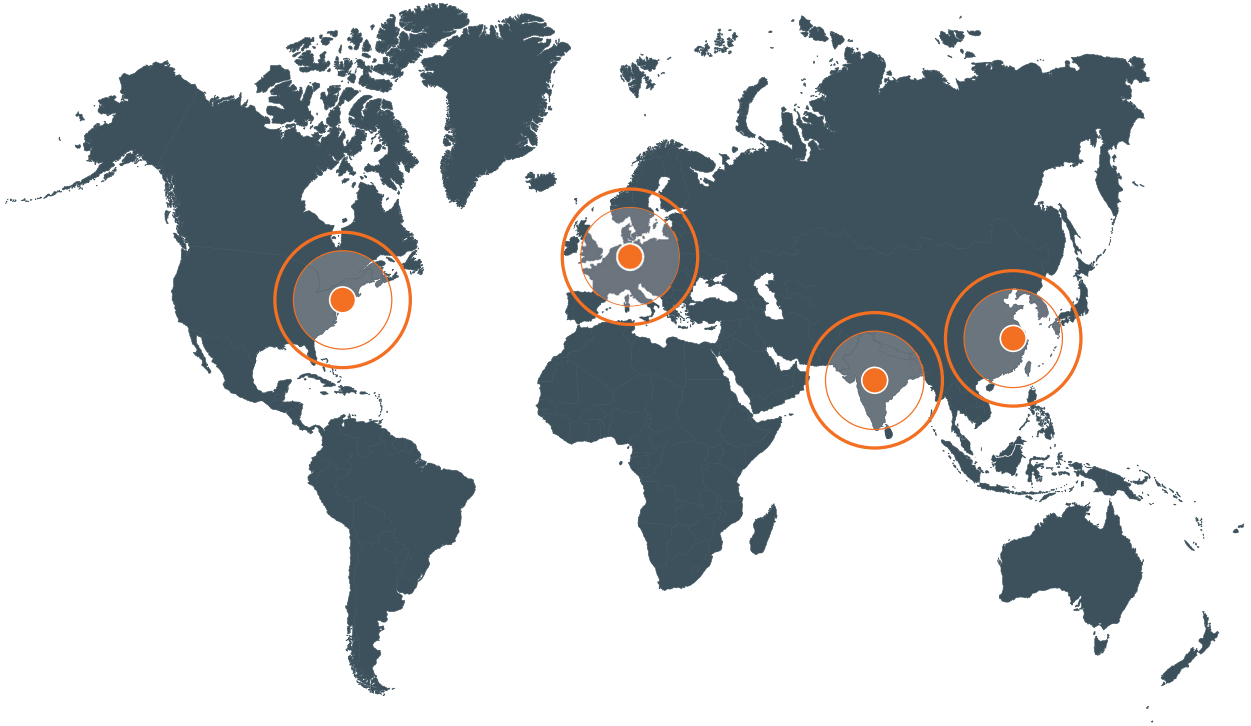
ROUTINE PRODUCTION

SGS Global Centers for Extractables & Leachables

Tailored study design and testing for extractables and leachables in finished pharmaceutical packaging, process equipment, and medical devices and leachables in final products.

SGS has a global expert network with more than 10 years of experience in E&L studies:

- New Jersey, USA
- Wiesbaden, Germany
- Navi-Mumbai, India
- Shanghai, China



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Health Science

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WHEN YOU NEED TO BE SURE

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