

Trends and New Standards in **Plastic Recycling.**

Learn how the innovative approaches of GALAB SafeCycle can help you achieve and maintain the highest quality and safety standards in the use of recycled plastics.



Includes: Compilation of the
34 most relevant analysis parameters.



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This white paper highlights the complex aspects of plastic recycling and presents the innovative solutions developed by GALAB to ensure the quality and safety of recycled plastics. With a focus on rigorous testing procedures and quality standards, the GALAB SafeCycle project positions itself at the forefront of environmentally conscious progress, aiming to create a sustainable and safe future for plastics.

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Introduction to the GALAB SafeCycle Initiative:

A New Approach to Safe and Efficient Plastic Recycling in an Environmentally Conscious Era.

In an era where sustainability and environmental protection are at the forefront of global discussions, efficient plastic recycling forms a critical pillar for a greener future. Despite the growing production and use of plastics, the global community faces an unprecedented challenge in the effective management and recycling of plastic waste. The GALAB SafeCycle initiative emerged from the necessity to make plastic recycling not only more efficient but also safer.





The Challenge in Plastic Recycling.

Plastic recycling is a complex challenge exacerbated by the variety of plastic types and their differing recyclability. Millions of tons of plastic are produced worldwide each year, but only a fraction is effectively recycled. A large portion of plastic waste ends up in landfills or is incinerated, leading to significant environmental burdens.

The main issues in plastic recycling lie in the separation of different plastic types and the removal of contaminants. These contaminants can impair the quality of the recycled material and limit its reuse in sensitive areas, such as food packaging. Additionally, differing colors, additives, and composite materials complicate the recycling process.

The rising demand for plastic products and the associated waste generation require innovative solutions to make recycling more efficient and effective. It is essential to find ways to safely and qualitatively reuse recycled plastics. This is not only important for environmental protection but also to enhance resource efficiency and promote the circular economy.



In this context, the GALAB SafeCycle project is playing a pivotal role. By developing cutting-edge recycling techniques and rigorous quality controls, it is helping to overcome the challenges in plastics recycling while paving the way for a more sustainable future.

The GALAB SafeCycle™ Project.

The GALAB SafeCycle project is a pioneering initiative aimed at radically improving the safety and quality of recycled plastics. In a world where the sustainability of materials is increasingly coming into focus, GALAB recognizes the urgency of ensuring safe and reliable plastics for use in sensitive areas such as food packaging and cosmetics.

At the core of the SafeCycle project is a comprehensive analysis and evaluation of recycled materials. Innovative methods for chemical characterization and classification are employed to identify a wide range of pollutants and contaminants, from common contaminants like heavy metals and phthalates to more complex chemical compounds that may pose health risks.



Through these rigorous testing procedures, GALAB ensures that the recycled plastics meet the highest safety standards and are suitable for use in a variety of products. This approach is revolutionary as it enables the reuse of post-consumer recycled (PCR) materials in more demanding and critical applications that were previously limited due to safety concerns.

The GALAB SafeCycle project is not only a technological breakthrough but also a significant step towards a more sustainable and responsible plastic industry that prioritizes environmental protection and consumer safety.





Areas of Application for SafeCycle Testing.



Food contact materials



Hygiene products



Toys



Cosmetic packaging

The areas of application for GALAB's SafeCycle testing are diverse, covering a broad spectrum of industries where recycled plastics are used. These tests are particularly relevant in sectors where high safety and quality standards are critical. This includes, above all, food contact materials, cosmetic packaging, toys, and hygiene products.

For food contact materials such as containers and packaging made of paper, cardboard, or plastics, it is crucial that no harmful substances migrate into the food. GALAB's tests ensure that these materials are free from contaminants, which is essential for food safety.



In the cosmetics industry, GALAB tests are instrumental in guaranteeing that cosmetic packaging is free from any harmful substances. Similarly, tests for toys and hygiene products are crucial in ensuring the safety and harmlessness of the materials used, which is of paramount importance to consumers, particularly children.

The SafeCycle inspection therefore makes a significant contribution to ensuring product quality and safety in various consumer sectors.





Critical Parameters and Testing Methods.

At the heart of the GALAB SafeCycle project are advanced testing methods and precisely defined parameters that are critical for assessing the safety and quality of recycled plastics. The project encompasses a wide range of tests to ensure that the plastics are free from harmful substances.

These substances include:

PFAS: Chemical compounds used in many industrial and consumer products, known for their water, grease, and stain-resistant properties. PFAS are persistent in the environment and may be harmful to health.

Dioxins/Furans: A group of chemical compounds that are classified as persistent organic pollutants. They primarily arise from combustion processes and may have long-term health effects, including increased cancer risk and immune system disruptions.

PCBs: Polychlorinated biphenyls (PCBs) are toxic and carcinogenic organic chlorine compounds. They have been used in electrical equipment, paints, flame retardants, and plastics. PCBs are environmentally harmful and difficult to degrade.

[Complete list on the next page.](#)



Endocrine Disruptors: Chemical substances that can disrupt the hormonal systems of humans and animals. They are found in many everyday products and can cause reproductive disorders and other health problems.

Allergenic Fragrances: Chemical compounds in perfumes and other scented products that can trigger allergic reactions such as rashes or breathing difficulties.

PAHs (Polycyclic Aromatic Hydrocarbons): Hazardous organic compounds that result from the incomplete combustion of organic material. PAHs are carcinogenic and environmentally harmful.

Primary Aromatic Amines (PAA): Chemical compounds that can arise from the degradation of azo dyes and may be potentially carcinogenic.

Organotin: A group of tin-organic compounds used as stabilizers in plastics and as biocides. Some organotin compounds are toxic and act as endocrine disruptors.

Cr(VI): A highly toxic metal valued in industry for its corrosion inhibiting properties, but which can cause serious health problems.

Mycotoxins: Toxins produced by molds that can cause severe health damage if ingested.

Formaldehyde: A chemical compound used in many building materials and household products, known for its carcinogenic properties.

Plasticizers: Chemical additives in plastics that increase their flexibility. Some plasticizers may be harmful to health.

Heavy Metals: Metals like lead, mercury, and cadmium that are toxic and can cause health problems with prolonged contact.

Pesticides: Chemicals used for pest control. Residues of pesticides can be toxic to humans and animals.

Biocides: Substances designed to combat harmful organisms. Some biocides are harmful to health and environment.



Phthalates: Plasticizers commonly used in plastics, known to cause endocrine disruptions.

Microbiology: Examination of microbial contamination that can occur in materials, especially concerning hygiene and perishability.

Higher Aldehydes: Organic compounds that are used as intermediates in chemical syntheses and as aromatic substances. Like formaldehyde, higher aldehydes are harmful to health and irritate the mucous membranes and respiratory tract even in very low concentrations.

Plant Alkaloids: Naturally occurring chemical compounds in plants that are often toxic and serve as a defense against herbivores.

Process Contaminants: Unintended impurities that may arise during manufacturing processes.

Alkylphenols/Ethoxylates: Chemical compounds used in many industrial and consumer products that are harmful to health and environment.

Bisphenols: Chemicals used in the plastics industry that are controversially discussed due to their hormone-like effects.

Brominated Flame Retardants: Chemical compounds used in various plastics to reduce their flammability, but which are of concern for environmental and health safety reasons.

BTEX Aromatics (Benzene, Toluene, Ethylbenzene, Xylene): Volatile organic compounds originating from petrochemical processes and used as solvents. They are harmful to health and pose environmental risks.

Volatile Organic Compounds (VOCs): A large group of easily vaporized chemicals that come from various industrial and natural sources and can affect air quality.

Elements: Testing for specific chemical elements in plastic materials that may be toxic, such as lead, cadmium, and mercury.

Migration Test: Investigations assessing how much of certain substances can migrate from plastic materials to contact materials, especially in food packaging.



10 ppb Screening: A highly sensitive test for detecting traces of pollutants in materials at levels of up to 10 parts per billion.

Sensory Test: Assessment of the effects of plastic materials on smell and taste, especially in food contact applications.

Sample preparation: Standardised methods for the preparation of plastic samples for analytical tests to ensure consistent and reliable results.

GALAB's testing methods are designed to enable a comprehensive chemical analysis of these parameters. This includes advanced techniques such as mass spectrometry and chromatography. These methods allow for the precise identification and quantification of even the smallest amounts of contaminants.

In addition, GALAB employs specific testing procedures for various applications, such as migration tests for food contact materials, to ensure that no harmful substances migrate into food products. These rigorous testing standards ensure that recycled plastics are not only environmentally friendly but also safe for the end consumer. With these innovative methods, GALAB is setting new benchmarks in the plastic recycling industry.



The Future of Plastic Recycling and the role of GALAB Laboratories.

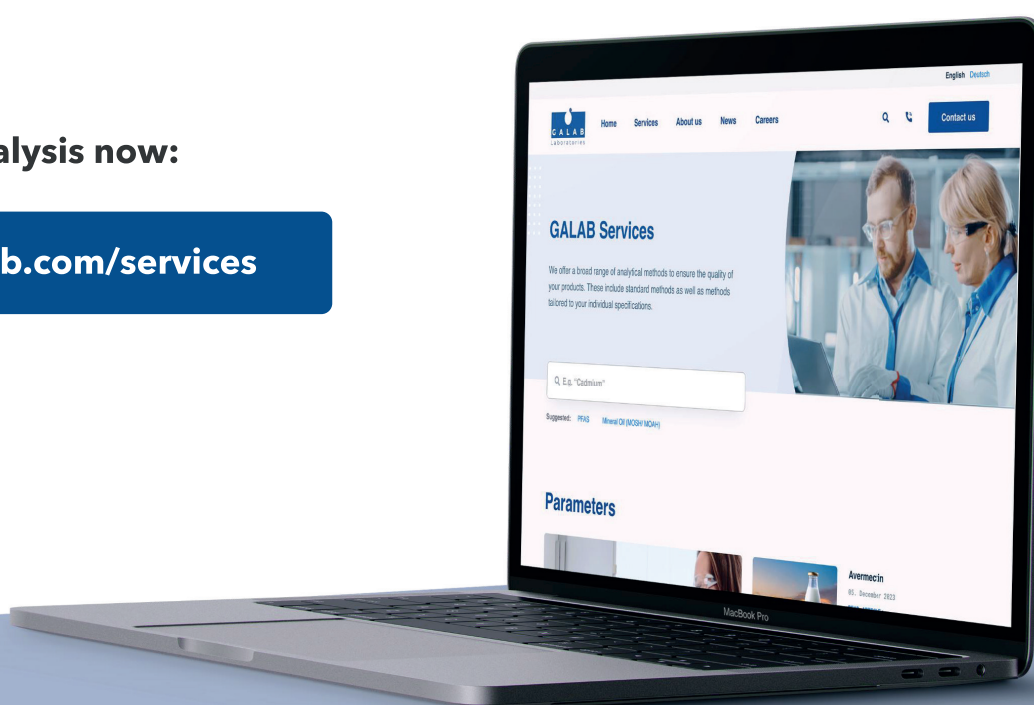
The future of plastic recycling is characterized by innovation and sustainability, with GALAB playing a key role.

The SafeCycle initiative paves the way for more efficient and safer recycling methods, which are crucial for reducing environmental impact and promoting a circular economy.

GALAB's commitment to quality and safety in the recycling process is pioneering and will fundamentally change the way the industry recycles and reuses plastics.

Request an analysis now:

www.galab.com/services





Get in touch with us now.

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