

PLASTICS CIRCULAR ECONOMY ASSURANCE SOLUTIONS

Helping you to close the loop





Plastics circular economy assurance, testing and certification - helping companies advance recycled polymer development

Climate change, energy use, resource availability, pervasive waste in our environment, changing consumer preferences and pressures from investors or governments are driving us to rethink wasteful models of production and consumption. Bringing quality, safety and sustainability to life, our risk-based quality assurance program, **CIRCULARASSURE**, provides testing, auditing, certification, and unique insight-enabling analytical technologies that help you to purposefully move towards a circular economy for plastic.

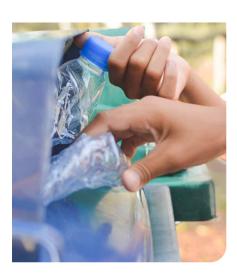
Across all sectors, businesses face pressures from consumers, governments, investors and environmental bodies to rethink wasteful models of production and consumption, reduce their environmental impact and justify their green claims. Many are designing materials, product or processes to ensure that they are kept in productive use for as long as possible and then can be re-used or recycled.

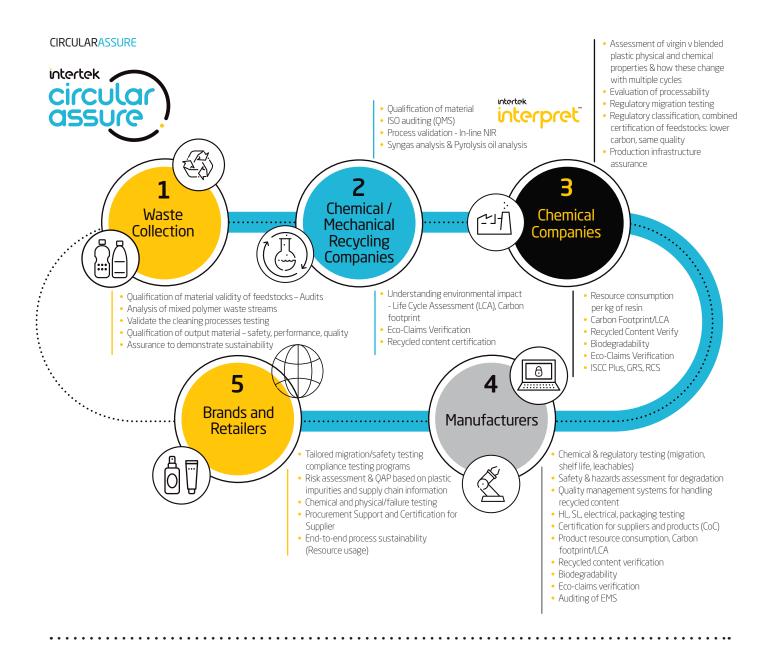
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Legislative developments, including the European Green Deal, EU Directives on waste or single-use plastics, and the UK Plastics Packaging Tax, are driving companies throughout the polymers/plastics value chain to rethink wasteful production and consider what happens after consumption of their

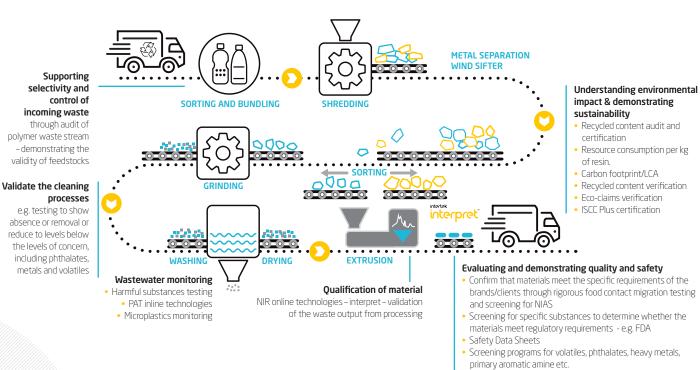
products. Companies are also looking to accelerate innovation processes that are driven by sustainability goals to achieve safe, well-performing products that are differentiated in the marketplace.

CIRCULARASSURE comprises a programme of assurance, testing and certification services that can be applied across the recycled plastic value chain from waste collectors and recycling companies to polymer producers and brands, enabling each stakeholder to ensure quality, safety, and optimise the value of products within the plastics/polymer circular economy.





CIRCULARASSURE FOR WASTE COLLECTORS, SORTERS & MECHANICAL RECYCLING



CIRCULARASSURE FOR CHEMICAL RECYCLING

Supporting selectivity and control of incoming waste

through auditing mixed polymer waste stream - demonstrating the validity of feedstocks

Process Validation In-line scanning powered by

NIR testing for ongoing quality

Product Quality · Quality control testing of

pyrolysis oil (physico-chem, impurities, etc.) Syngas analysis (for

Regulatory Compliance

ongoing use as fuel)

REACH Regulatory guidance & documentation coupled with testing

Hydrocarbon **Analysis**

Crude Oil, Petroleum & Refined Products, Fuels, Chemicals, Gas (Propane, Butane)



interpret

CRACKER





GRINDING WASHING



Qualification of material - NIR

online technologies - interpret validation of the waste output from processing

Commercial viability - From process

Contamination testing / screening /

Comparison of recycled material vs virgin

material to assess physical & chemical

properties - how do these change

Processability evaluation (lab scale compounding, extrusion and testing)

through cycles of recycling?

Laboratory testing solutions - advanced R&D support or standardized testing (e.g. ISO and ASTM), comparison of

protype to scale-up

materials on scale-up

investigations

ISO auditing (QMS)

interek interpret

OUTPUT: SYNGAS / HYDROCARBONS









environmental impact & demonstrating sustainability: Recycled content audit

Understanding

- and certification
- Resource consumption per kg of resin
- Carbon footprint/LCA / Eco-claims verification
- ISCC Plus certification

Process Health

Chemical screening tests for unwanted substances of concern to disrupt crackers e.g., chlorine, oxygen and silicon

MONOME

FEEDSTOC

Product Quality

QC of incoming material for the polymerisation process

Processing Infrastructure Assurance

- Risk-based asset management Aware[™] • Corrosion Inspection, Materials corrosion engineering
- Turnarounds/shutdowns

Environmental Testing Solutions

- Emission Testing Technologies
- Waste water analysis
- Microplastics in waste water

Materials Quality and Safety

- Screening for specific substances to determine whether the materials meet regulatory requirements - e.g. FDA
- · Processability Evaluation of Circular materials
- Application-based consulting and testing e.g. food contact or substance that poses a risk to health e.g. heavy metals, PFAS

CIRCULARASSURE FOR PRODUCTION

- · Global market regulatory assurance
 - Biodegradability
 - · Laboratory testing advanced R&D support,
- standardized testing Contamination resolution
- Comparison of recycled material to virgin material to
- Chemical safety testing Processability evaluation
- (lab-scale compounding, extrusion and testing)

Processing production assurance solutions

- Product testing for physical and chemical properties and performance
- Failure or contamination investigations · Environmental quality
 - certifications ISCC Plus certification

Eco-Claims verification Supplier inspections Supplier risk mapping assess properties **MATERIALS SOURCING** MATERIALS R&D

Raw materials testing

- Carbon Footprint/LCA
- · Recycled Content Verification
- · Comparison of recycled material to virgin material or batch to batch
- Processability evaluation (lab-scale compounding, extrusion and testing)
- · Chemical safety testing
- ISCC Plus certification

\cap PRODUCT MANUFACTURING MATERIALS PRODUCTIO

Production infrastructure assurance

- Risk-based asset management -Aware™ Corrosion Inspection, materials
- corrosion engineering
- Waste-Water testing solutions
- · Emission testing technologies
- Microplastics monitoring
- Turnarounds/
- shutdowns inspection services



- Demonstration of
 - eco-claims Labelling
- Counterfeit
- investigations
- Consumer complaint Failure investigation

and safety audit and

Manufacturing specification testing

• Physical testing, impact testing, electrical safety

mechanical properties, adhesion, surface chemistry

Global regulatory guidance dossier stewardship

APPLICATIONS

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- GMP compliance inspections for food contact
- Migration NIAS testing physical properties
- · OEM specifications testing
- · Weathering & performance testing
- Certification against specifications

CIRCULARASSURE FOR BRANDS & RETAILERS

CHALLENGES



Pressures from consumers and retailers environmenta bodies to rethink wasteful models of production and consumption, reduce their environmental impact and justify their green claims



nvestors have a heightened focus on ESG measures
of the companies in their portfolios



Need to realize costs savings where possible (e.g lightweighting vs performance)

END-TO-END RISK-BASED ASSURANCE SOLUTIONS

Demonstrating commitment to sustainability:

Recycled content audit and certification, ISCC certification

Resource consumption per kg of resin

Carbon footprint/LCA

Recycled content verification

Eco-claims verification

ESG audits and corporate sustainability programs

Materials/product quality & safety Regulatory compliance and testing (e.g. food contact)

Performance and failure testing Contamination investigations



INTERTEK INTERPRET



Real-time analytics to drive greater insight and value for the recycling value chain

As the global polymers and plastics industry progress towards a circular economy, understanding innovative chemical recycling technologies and feedstocks is critical to optimizing recycling value chains.

Interpret provides clients with rapid access to vital characterization data required to make informed decisions on product quality and quantity, thus saving time and cost while also maximising output.

Feedstock

Analysis of feedstock for quality control and contaminant ID

Track overall feedstock composition

Conversion

Big data analytics to track processes & ensure optimum process conditions for maximum plant performance

Purification

Fast online analysis of products before and after separation processes for control & quality monitoring

End user

Added value for traders and refiners

Can provide data and assurance to marketplace



MITIGATING CIRCULAR ECONOMY CHALLENGES

Total Quality Assurance

From electronics to automotive, from packaging to construction, across all sectors that use polymers or plastics, **CIRCULARASSURE** helps businesses to close the loop and tell their sustainability story.

Contact our **CIRCULARASSURE** team now to discover how our risk-based quality assurance program can help you to achieve Total Quality Assurance and accelerate innovation of well-performing, safe and compliant products and processes that benefit our daily lives.





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