Our Services

impact solutions

Material Testing Laboratory & Innovation Centre

UKAS TESTING

Who are Impact Solutions?

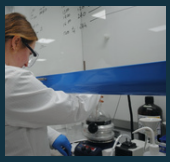
Impact Solutions is a UKAS and ISO 17025 accredited test laboratory (No.0402) and innovation centre based in Livingston, central Scotland. Founded in 2002, the company specialises in technical testing and product development for plastics, packaging, and materials.

With a dynamic team of experts, Impact Solutions supports global clients in material characterisation, solving engineering and technical challenges, and validating product performance. Our facilities and agile approach enable rapid, customer-focused solutions across many sectors.

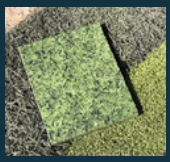
As an independent laboratory, we also host cutting-edge R&D projects, including innovation in testing for sustainable materials, and actively contribute to shaping industry standards and environmental best practices.

How can we help you?

Get in touch today.



Materials Analysis & Characterisation



Product & Process Innovation

Product Testing & Certification

Expert Witness & Consultancy

Scale-up & Prototyping

Business & Funding Support

Incubator & Start-up Space

Contents

Accelerated Weathering & Climatic Testing

Accelerated Weathering & Lightfastness

Accelerated weathering and lightfastness testing is designed to test the durability of your product under various climatic conditions. Any product which experiences direct sunlight is susceptible to the damaging effects of sunlight, UV and weather damage and requires testing to check material performance and lightfastness over time.

Using an accelerated weathering unit, the weathering process is accelerated by around 8 times with the equipment able to simulate conditions anywhere around the world. Samples can be evaluated for colour change and fading due to exposure of natural and artificial sunlight under a variety of conditions.

Impact Solutions are able to undertake UKAS accredited testing under our flexible scope allowing us to offer a variety of test methods and standards throughout a number of industries including, ISO, SAE J, ASTM, DIN, EN, PV, Ford, VW, Nissan and many more.

we work throughout a number of industries

Our weathering lab is home to a bank of Q-Sun Xe-3 Xenon Arc Chambers with full spray capabilities and QUV accelerated weathering testers. There are several UV options available to run, including UVA, UVB and UVC. These units can be booked on a tray basis and our capacity enables us to tailor our running standards to meet your needs.

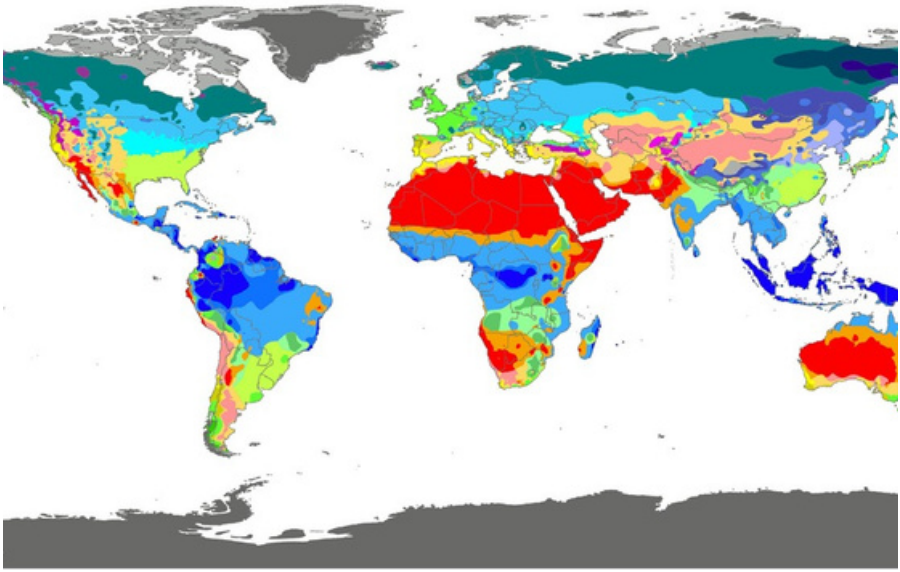
A selection of accelerated weathering & lightfastness standards:

- ISO 4892-2
- ISO 4892-3
- FLTM B0116
- SAE J 2412
- SAE J 2527
- MIL-STD-810G
- ISO 105 B04
- ISO 105 B06
- ISO 105 B02
- PV1303
- PV3929
- PV3930

Climatic Testing

Materials experience various environmental conditions during their performance and service life. These conditions include high and low temperatures, sun light, humidity, salt water damage and oxidation. Thus, the characterisation and performance of materials under actual working conditions are vitally important.

Impact Solutions is fully equipped to undertake accelerated weathering testing such as UV and Xenon exposure, cyclic temperature, humidity, vibration and shock testing. This testing helps us to understand how materials in industries such as automotive, aerospace, construction and infrastructure perform throughout their life. All environmental tests can be combined with mechanical tests, colour, grayscale, gloss and haze assessment to fully understand the material behaviour.



Impact-Bio®
Biodegradation Testing

Biodegradation Testing at Impact Solutions

With rising regulatory pressure and the global push towards verified sustainable materials, navigating biodegradability testing can be complex. Impact-Bio® exists to provide clarity and translate technical requirements and legislative changes into clear, actionable guidance. We are driving real change across the biodegradation landscape to ensure test methods are fit for purpose and deliver credible, defensible results.

Our expertise in regulations, in accordance with ISO, ASTM, BSI, CEN and OECD standards, will give you confidence that your data meets the standards of regulatory, commercial, and environmental scrutiny.

Identifying the correct route of testing is important.
Why should you trust us?

Scientific Leadership

World experts in biodegradation processes and outcomes.

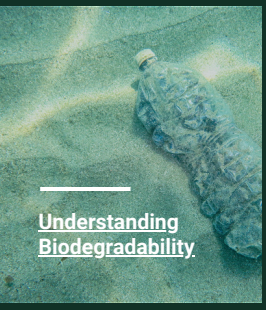
Rapid Screening

Predictive accelerated tests providing results in days, not months

Regulatory Expertise

Guidance on global regulation, including green claims and marketing compliance.

How can we support you?



Mechanical Testing

Mechanical Testing

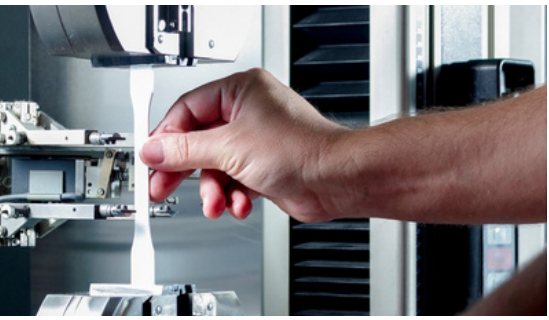
Mechanical testing is fundamental to understanding the behaviour and limits of a materials performance. To ensure product quality and service life, it is necessary to perform short and long term mechanical testing at every stage of production. We can test from raw materials to final product using methods such as tensile strength, impact properties, deformation with temperature and creep. Our team have industry experience stretching back 50 years, giving us a wealth of knowledge to draw on when carrying out mechanical testing for commodity and engineering polymers as well as composites.

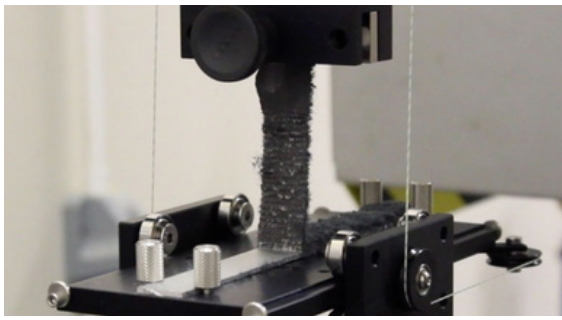
Failure Analysis | **Material Characterisation** | **Product R&D** | **Quality Assurance** | **Expert Witness**

In addition to mechanical testing, Impact Solutions can support companies formulation and material development to optimise processing and performance in-use, with additives such as mineral fillers, lubricants, plasticisers, pigments, anti-oxidants and fibres.

Mechanical tests include:

- Tensile, Modulus, Poisson Ratio, Yield Point
- Flexural strength & modulus
- Impact, Hardness
- Heat Distortion
- Temperature, Vicat
- Fatigue
- Compression



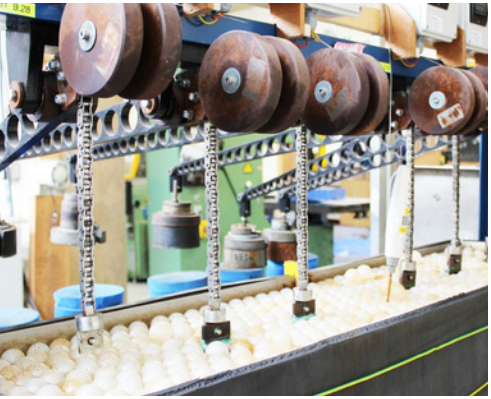


Environmental Stress Cracking

Environmental stress crack resistance (ESCR) is an important property of polymers to understand when developing a product and is a common cause of brittle failures. Unlike impact fractures, environmental stress cracking occurs in components after a period of time, often under loads where the polymer would not be expected to fail in air.

A number of tests have been developed to determine the environmental stress crack resistance of plastics. Two of the most common being the Bell Telephone Test (BTT) and the Full Notch Creep Test (FNCT).

Impact Solutions is one of the leading laboratories for the analysis of environmental stress cracking and is UKAS accredited to carry out FNCT.



Flammability Testing

Small-scale Flammability Testing

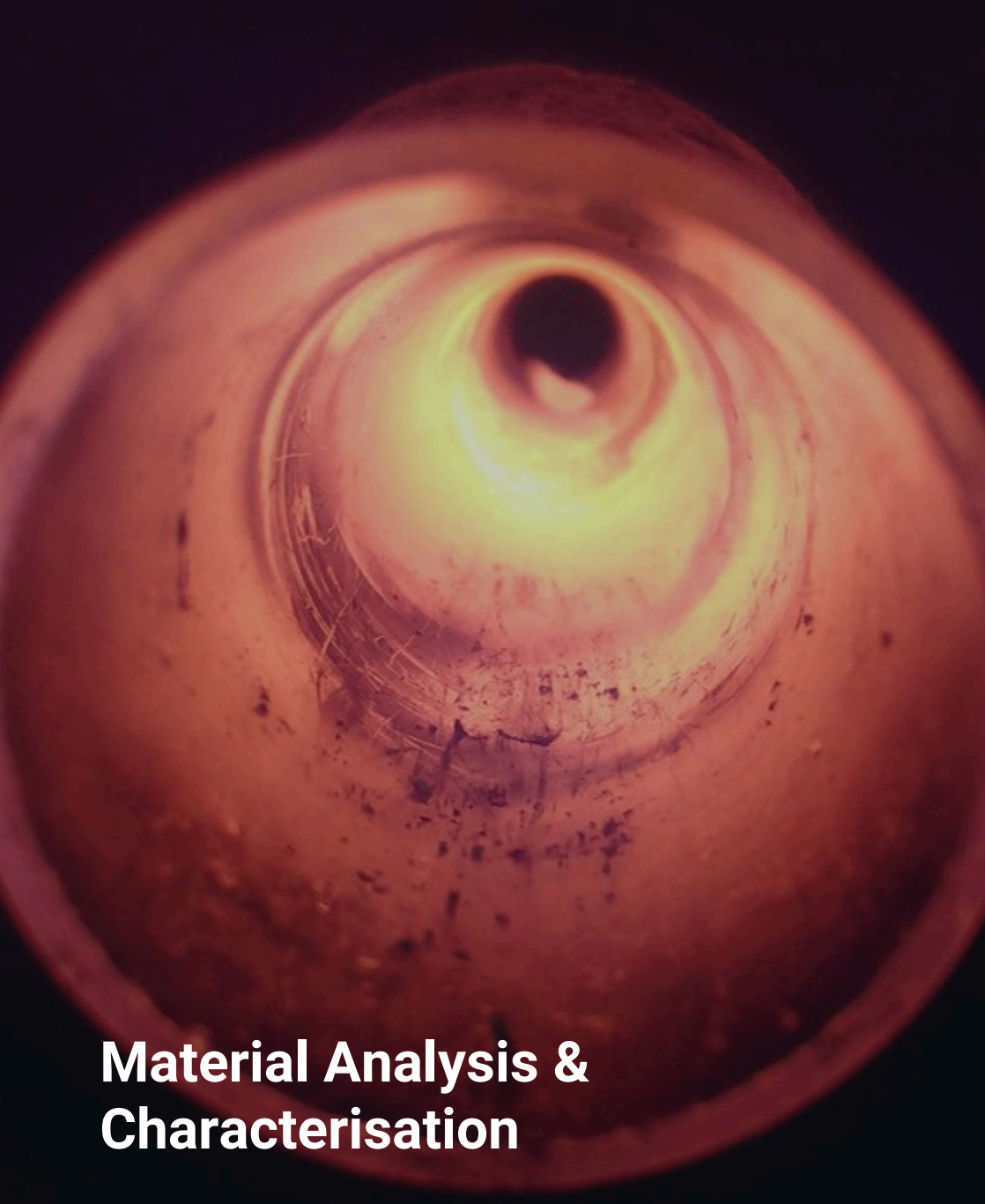
We offer specialised small-scale fire testing services to help you assess the flammability of your materials or products. Our testing is conducted in accordance with industry-leading standards, including UL94, ASTM, and ISO, ensuring reliable and accurate results.

We cater to a range of industries, such as automotive, consumer goods, and electrical sectors, but our expertise doesn't stop there. Our team of experienced professionals can design customised testing setups to simulate the real-world conditions and performance specific to your product, providing you with insights that go beyond standard testing protocols.

Whether you're looking to meet regulatory requirements or gain a deeper understanding of your material's behaviour under fire exposure, we are here to support your needs with expert guidance and tailored solutions.

Flammability tests include;

- UL-94 (vertical & horizontal orientation)
- IEC 60695-11-10
- ASTM D 635
- ASTM D 3801
- ISO 11925-2
- ISO 3795
- FMVSS 302



Material Analysis & Characterisation

Material Analysis

Material analysis is an essential tool in identifying materials, assessing if they meet specification and determining their properties to understand how they will react to a given environment.

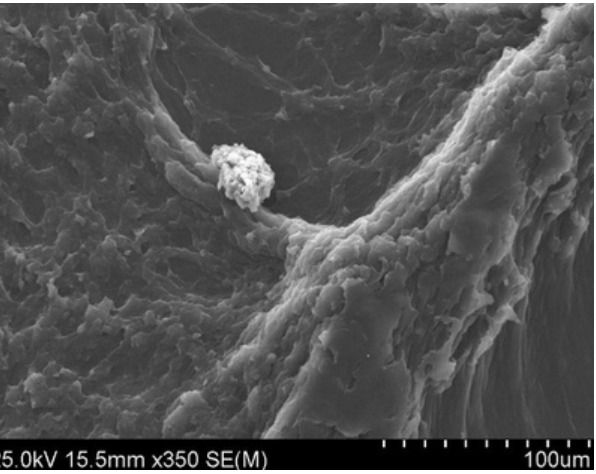
Impact Solutions can perform a full suite of material analysis and characterisation, investigating everything from rheological and structural properties to flow behaviour and chemical composition.

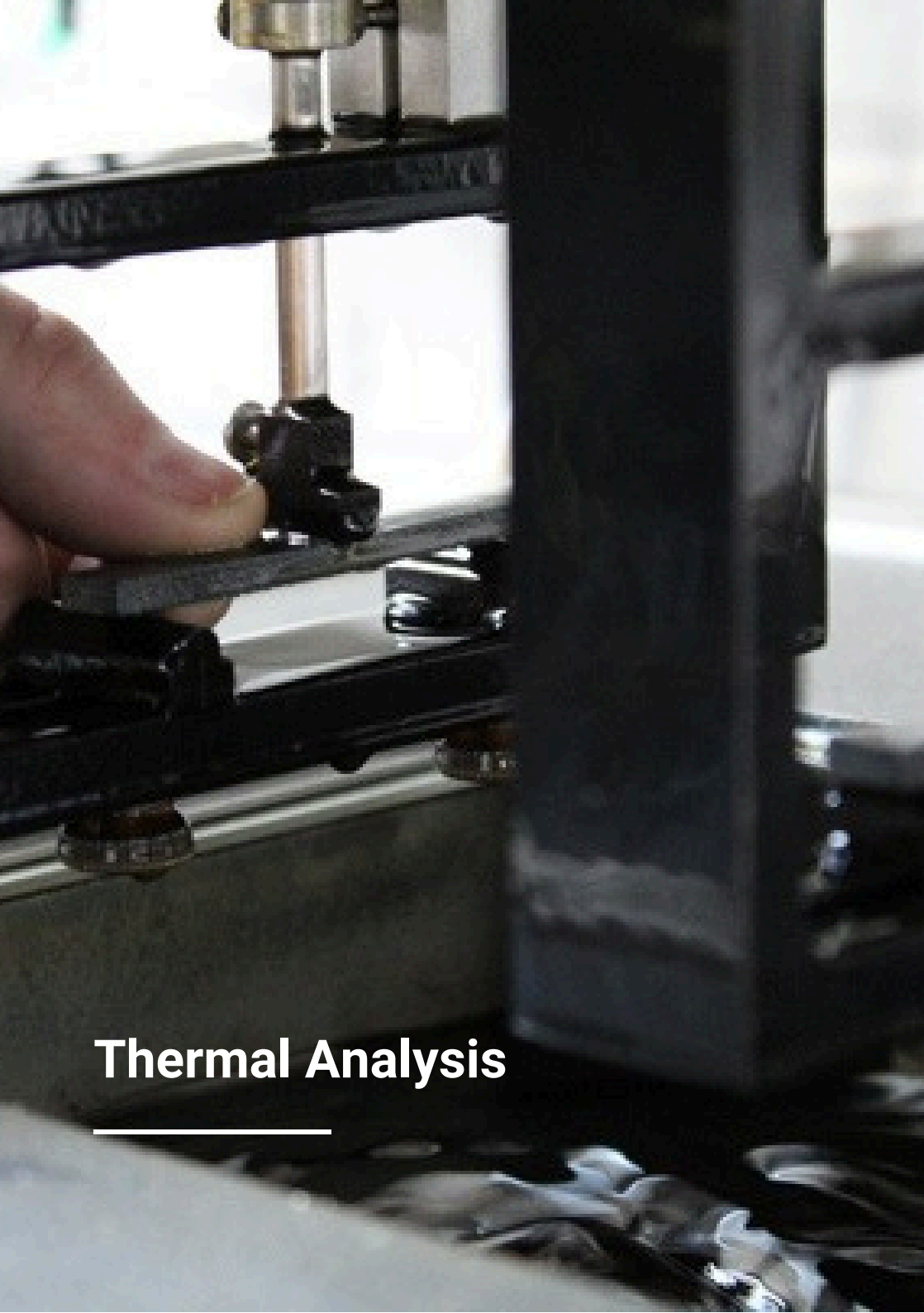
Material analysis techniques are often used by Impact Solutions to carry out failure analysis. FTIR, DSC, optical and scanning electron microscopy can check the mode of failure, crack propagation and characterise chemicals or contaminants present.

A product's aesthetic properties and durability can also be assessed through material analysis with techniques like haze, colour, tear and abrasion resistance.

Material analysis & characterisation tests include:

- **Rheology**
- **MFI**
- **Density**
- **Microscopy**
- **Intrinsic viscosity**
- **DSC & FTIR**





Thermal Analysis

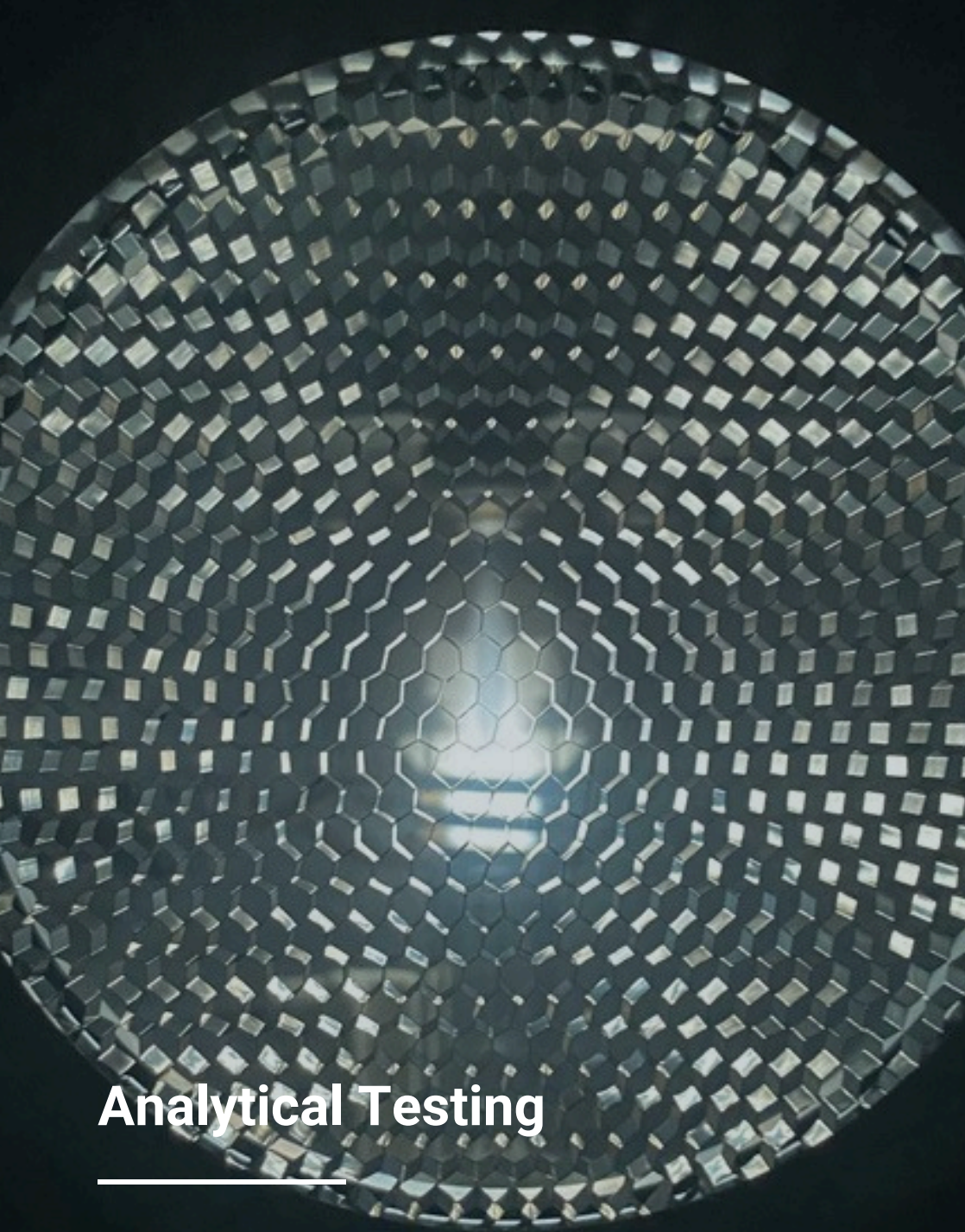
Thermal Analysis

Thermal analysis techniques allow the measurement of physical, chemical, and thermodynamic changes taking place within a material under differing temperatures. These methods can pinpoint when and at what temperature significant changes occur allowing for the identification of material, their properties and how they react to temperatures. Impact Solutions is one of the few material laboratories which is UKAS accredited (no.0402) in providing these techniques.

Thermal properties of plastics and composites strongly depend on molecular structure. Thermal analysis techniques help determine properties such as the glass transition, melting of crystallites and thermal degradation of macromolecular chains in thermoplastic resins. These tests give our customers the critical data and confidence they need to fully understand the characteristics of their material or end product.

We are capable of assessing the entire thermal behaviour of plastics and plastic composites through the following techniques: heat deflection temperature determination, differential scanning calorimetry, thermogravimetric analysis and dynamic mechanical analysis.

techniques for assessing thermal behaviour of plastics and plastic composites



Analytical Testing

Analytical Testing

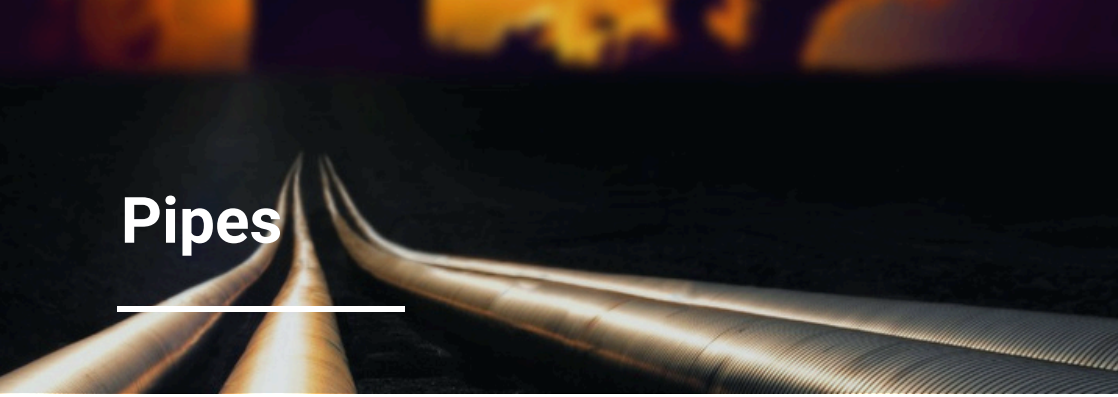
Analytical testing is a vital tool that can greatly benefit the plastics industry in various ways. It can help to ensure compliance with not only industry standards and environmental regulations, but also customer own specifications. This can serve as external quality control or provide invaluable insights to enhance material performance, address failure issues, and tackle contamination concerns.

Impact Solutions offer a comprehensive range of analytical testing. Amongst others, we can support customers by providing essential data to better understand the properties and processing behaviour of polymers. These insights into polymer structure and/or composition are key in understanding performance characteristics ensuring optimized material use and reliable product outcomes. Furthermore, we provide compositional analysis via GC-MS and ICP- OES. For example, it enables the determination of heavy metals as specified in the RoHS directive, as well as volatile and semi-volatile contaminants in plastics.

With our advanced analytical testing capabilities, Impact Solutions is committed to helping you achieve superior quality, compliance, and performance in every aspect of your business.

Some of our analytical equipment include:

- **Titration**
- **HT-GPC**
- **GC-MS**
- **ICP-OES**



Pipes

Testing of Pipelines and Material

Impact Solutions have over 50 years' experience in the development of pipes and pipe grade materials. Our experience spans both the material specification of plastic pipes, the manufacturing process and their installation across the construction and oil & gas industries.

Our test laboratory has a full range of equipment for physical characterisation and mechanical testing including carbon black, microscopy, creep, tensile and environmental stress crack resistance. We have in house plastic pipe welding equipment and the facilities to undertake a wide range of pipeline and weld integrity tests to ISO, ASTM and industry specific standards. We work with pipes from as small as 15mm right up to 1600mm in diameter.

Services include testing, failure analysis, expert witness and full QA/QC specifications for new pipeline installations.

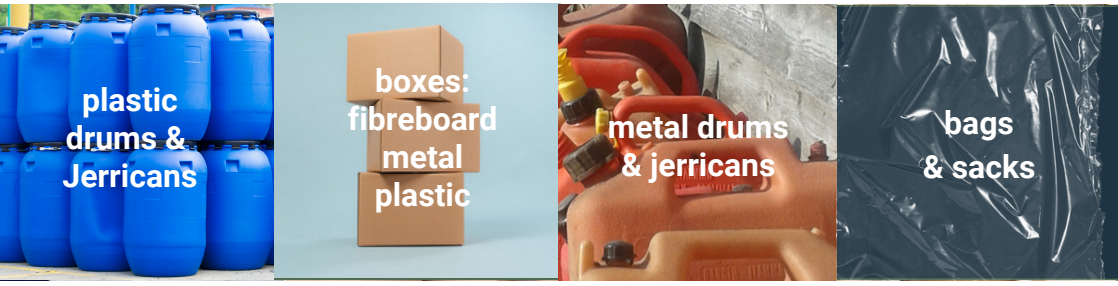
Pipe tests include:

- Tensile Properties BS EN 6259
- Pipe Weld Testing -ISO 13953/13954
- Failure Analysis - for pipes and fittings
- Full Notch Creep ISO 16770
- Material Analysis - BS EN 12201

Packaging

Packaging

Our team have been performing packaging testing and developing container grade plastics since the 1970's, with much of the high density polyethylene containers used today coming as a result of development from our team. Our extensive packaging testing facilities allow Impact Solutions to test to a variety of standards, or apply our knowledge to help you develop new containers and packaging solutions.



Examples of packaging types

Impact Solutions is a UN dangerous goods packaging testing facility, accredited by the VCA to test most types of UN dangerous goods packaging and our facility is unique in the UK. We have the ability to handle customer's own product or development liquids and just about anything that needs safe containment including testing of solids. Our experience and customer service makes us a first stop for clients throughout the world. For clients outwith the EU, we can provide a certificate holding service.

Packaging tests include:

- Drop
- Air Leakage
- Hydraulic
- Stack
- Chemical Compatibility
- Puncture & Impact
- Vibration
- Climatic (+300C to -80C)
- Atmospheric
- Bespoke Options Available

recyclability testing

The challenges of recyclability testing

Increased demand and use of recyclate materials due to government legislations means you need to understand what materials you are dealing with.

Impact Solutions can help you quantify the performance and processability of recyclate feedstocks to help you achieve a packaging product compliant with a circular economy.

Benefits of Testing

- Peace of Mind
- Brand Reputation & Transparency
- Records to Avoid Dispute
- EA Approval

Our Services:

- Material characterisation
- Generating datasheets
- Method standards development
- End of waste determination
- Regulation compliance
- Recycled content verification (PET)
- Recyclability Studies

Recyclate Characterisation

As per the NPPT (Non Packaging Plastics Protocol) we can undertake recycled material characterisation testing standards that go far beyond the minimum requirements as set out in BS EN 15344 (PE), BS EN 15345 (PP), BS EN 15348 (PET).

Test/Activity	Standard Method
PE	BS EN 15344
PP	BS EN 15345
PET	BS EN 15348

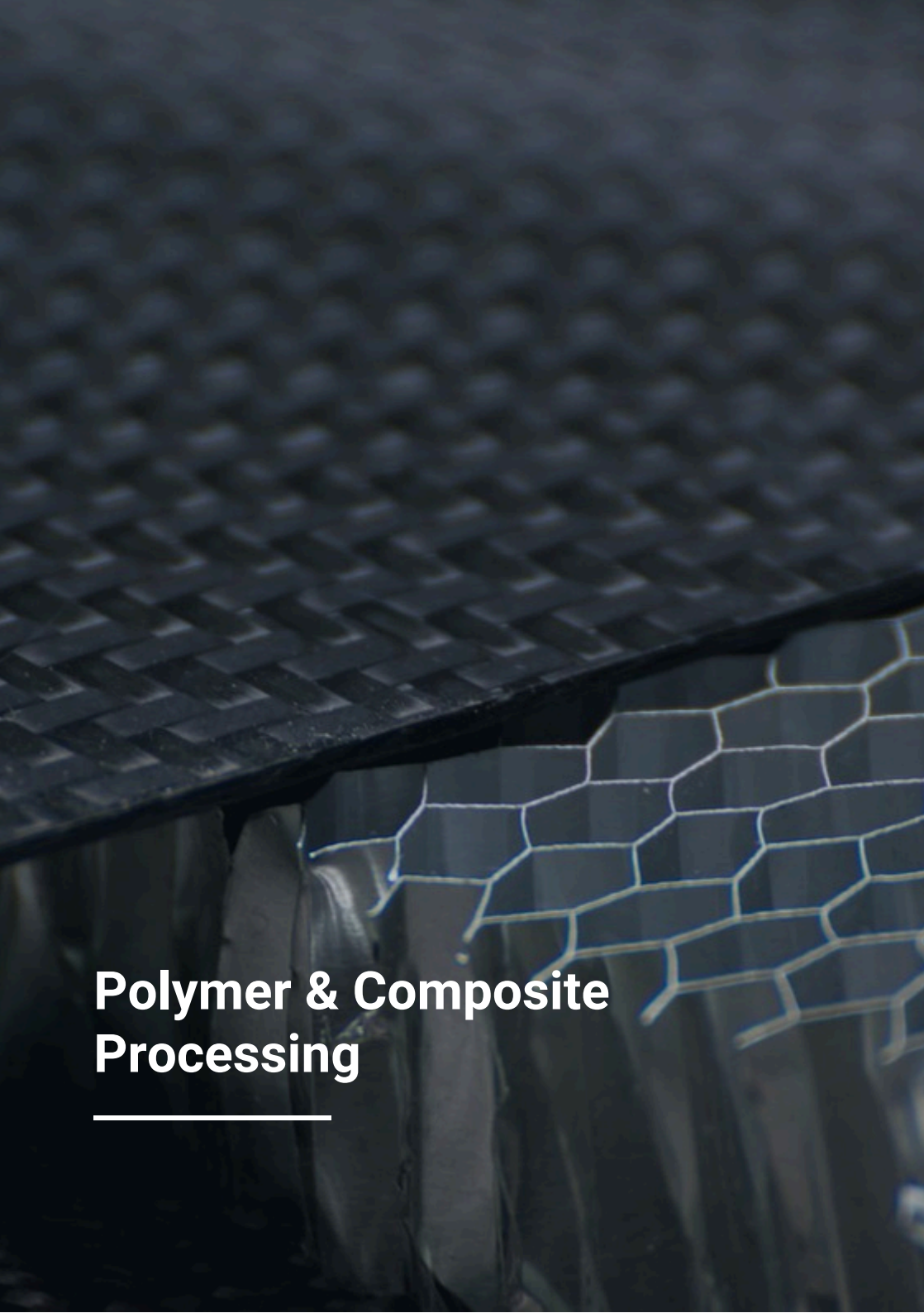
This includes characterising the effect on processability including but not limited to:

- Density
- Melt Flow Index
- Ash Content
- Gas/Volatile Content
- Filtration

And effects on the final product, including:

- Yield and Ultimate Strength
- Modulus
- Colour, Transmission, Haze, Surface Appearance
- Elongation
- Puncture Resistance
- Impact Resistance
- Environmental Stress Crack Resistance

As part of our recycled content verification services, Impact Solutions has worked alongside BSI and a large consortium to develop BS Flex 6228, a BSI Flex standard test method that allows the determination of percentage of recycled content in clear PET packaging to compare it with a mass balance audits.



Polymer & Composite Processing

Polymer & Composite Processing

Material Processing

Impact Solutions have extensive capabilities for compounding, sample preparation and small scale production of materials. This includes the ability to compound and prepare thermoplastics through the use of a small scale compounder, injection moulder, film extrusion, blowing and compression moulding.

We regularly work on projects to develop composites across multiple industries including automotive, aerospace, textile, oil & gas and construction industries. The materials developed and tested are mainly long/short chain reinforced thermoplastic, reinforced thermosets, laminates and adhesives.

Sample Preparation

Our facility houses the capability to produce samples for the range of testing we conduct as well as prototyping for R&D, this includes CNC machining, cutting and notching of samples and CAD facilities.

Product Identification

FINAT Testing

Impact Solutions offers product identification testing providing label testing to FINAT standards, which covers critical aspects such as adhesion, durability, and environmental resistance, ensuring labels remain intact and legible under real-world conditions.

Our testing services cover critical label properties, including:

- Adhesion performance
- Durability testing
- Environmental performance

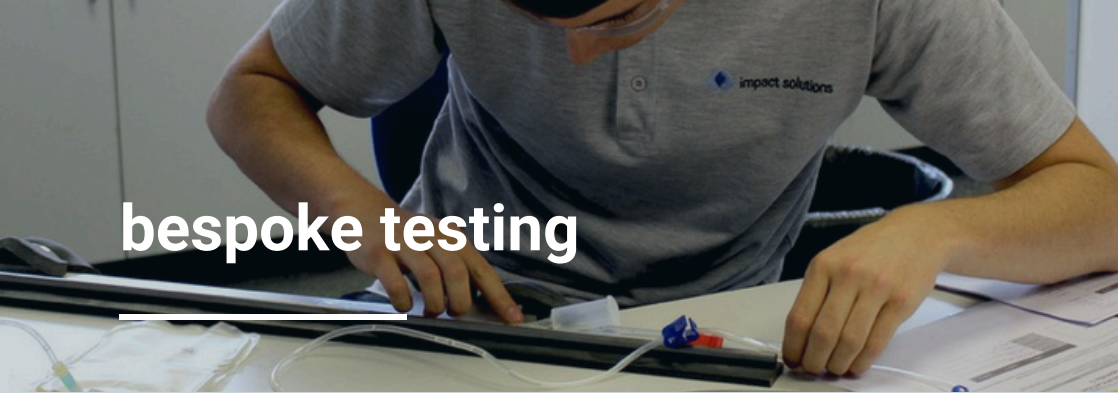
Asset marking Testing

BS 10121:2022 Asset Marking Testing standard provides comprehensive guidelines for testing asset markings to ensure their effectiveness and durability. By adhering to this standard, manufacturers can guarantee their marks withstand temperature, humidity, and other environmental challenges.

Our asset marking testing also validates that identifying marks like barcodes and serial numbers are durable and dependable, even in tough environments. This is essential for supporting traceability, compliance, and long-term asset management.

Marking technologies BS 10121:2022 standard applies to;

- Forensic Marking (Type F)
- Radio Frequency Identification Tags (RFID) (Type G)
- Security Labels (Types H, I, J)
- Stamping (Type K)
- Chemical Etching (Type A)
- Chemical (UV) Etching (Type B)
- Laser Etching (Type C)
- Engraving (Type D)
- Microdots (Type E)



bespoke testing

Bespoke Services

Impact Solutions understand that our clients have very specific needs and challenges which often aren't met through industry standard testing. This is why we offer a unique bespoke testing service. Whatever the requirements, we work with you. Whether that is developing new standards, test methods or creating equipment that allow us to test products to real-world conditions. We work to offer test methods that are not used extensively within industry and can adapt our services to be able to handle them.

We have decades of industry knowledge and technical expertise to draw upon, setting us apart from other test facilities.

This work has seen us deliver new methods for testing products, from cutting edge materials to life saving equipment, across multiple industries such as:

- Product Development
- Custom Packaging
- High Performance Materials
- Oil and Gas
- Medical Devices
- Trading Standards
- Utilities
- Expert Witness

Expert Witness & Failure Analysis

Failure Analysis

When products or materials fail in-service it is critical to accurately and quickly identify and assess the cause of the failure, enabling processes to be put in place to mitigate or prevent future recurrences. This is at the heart of failure analysis.

Failures can happen for a host of reasons including material fatigue, molecular degradation, oxidation, brittle fracture or by how the product was originally designed and/or its use during service. Impact Solutions have a wide range of in-house equipment allowing fast turnaround times for failure analysis testing both on and off-site.

With our experience in material and product design coupled with our top-class material characterisation facilities, Impact Solutions can investigate the cause of failures and provide solutions for failure reduction in future. Our track record has helped companies save millions by quickly getting answers to their plastic failures in order that they put in place corrective actions as quickly as possible. We work with you to evaluate the failure and propose solutions.

Our failure analysis approach:

1. Material Characterisation
2. Visual Inspection
3. Microscopic Examination
4. Generate Test Programme
5. Results & Analysis

Testing for failure analysis:

- **Optical and scanning electron microscopy** coupled with an EDX to look at the failed surface and, failure mode and for contamination.
- **Infrared spectroscopy** to check the base resin, contamination, degradation, oxidation.
- **Thermal analysis (DSC)** to check for contamination & obtain history.
- **Thermogravimetric analysis (TGA)** to check stability of failed parts.
- **Gas chromatography mass spectrometry (GCMS)** to check the additives and for contaminates.
- **Inductively Coupled Plasma (ICP-OES) & High Temperature-Gel Permeation Chromatography (HT-GPC)**
- **Mechanical testing and artificial ageing** to investigate failure stresses

Expert Witness

As an independent and accredited test laboratory, Impact Solutions are ideally placed to provide expert witness services. Our testing and certification expertise in polymeric and composite materials has been used as an invaluable tool to undertake legal challenges. We have an extensive track record of successful expert witness and legal cases, providing testing services, expert testimonies in court as well as for insurance companies and stakeholders.

Our experts cover a wide range of industries where polymers and composites are used such as: construction, infrastructure, automotive, oil & gas, energy, consumer, and electronics.

As a leading UK laboratory, we can offer the most rigorous testing able to stand up in a court of law and can provide a high degree of flexibility allowing companies and legal firms to observe testing in the laboratory under supervision.

Unrivalled experience in materials

A fully equipped UKAS laboratory

Track record of successful cases

Flexible hours & scheduling

Full access to laboratory & experts

Open Innovation

Impact Innovations

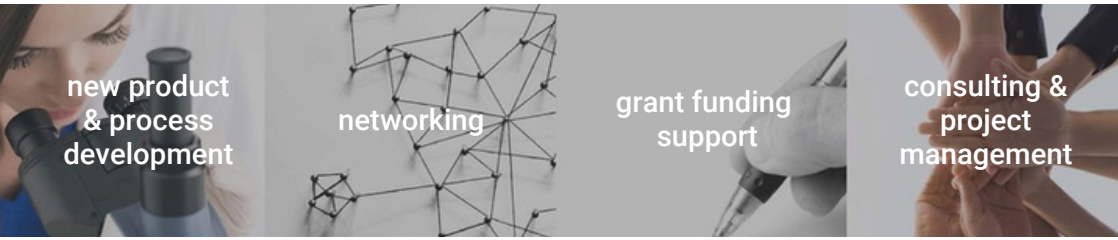
Impact Solutions have a dedicated team of experienced R&D chemists, engineers and material scientists able to support your R&D challenges. The team are experts in running complex out-sourced R&D projects from concept through to commercialisation as well as providing consulting services.

Impact Innovations is committed to sustainable innovation. We don't just develop technologies; we craft solutions that respect our planet. Our focus is steadfast: create innovations that minimise our environmental footprint.

Our team meticulously considers the full life cycle of every new product or process, a holistic approach to product development. With a robust track record of high-impact projects, we are trusted industry leaders. Our expertise spans battery science, novel materials and formulations, biotechnology, and recycling.

We don't just work for you; we work with you. Our experts become an extension of your R&D department, ensuring a smooth and effective technology transfer. Partner with us and gain direct access to our state-of-the-art labs. We also offer dedicated incubator spaces to nurture start-up innovation.

From global multinationals to budding start-ups, we tailor our approach to meet your unique needs. We are committed to your success. Our team actively assists start-ups in identifying and securing essential grant funding for their groundbreaking projects.



Innovation Case Studies

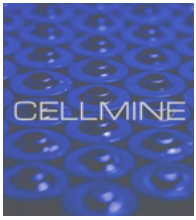
Developing projects to support Scotland transition to a Net Zero economy impact innovations have been innovating in novel ways. Here are some key innovation project case studies:

olatek

OlaTek project aims to create a sustainable biosynthetic process that uses fish waste to produce olefins—key chemicals used in lubricants, surfactants, and oils. OlaTek will repurpose over 200,000 tonnes of UK fish waste annually, offering an eco-friendly solution to a significant waste issue. By combining molecular biology from the Wallace lab at The University of Edinburgh with innovative process engineering from Impact Solutions, the project will develop a scalable, bio-catalytic process to generate high-demand, bio-derived olefins.

PAINTS

PAINTS focuses on replacing petrochemical styrene in paints and coatings with bio-based styrene, aiming to reduce the industry's carbon footprint. Using bio-derived feedstocks, the project employs enzymatic conversion to produce bio-styrene for creating low-impact, high-performance polymers. In partnership with The University of Edinburgh, PAINTS is optimizing the production process through synthetic biology, enhancing yields and ensuring scalability.



CellMine

CellMine is pioneering lithium battery recycling with innovative technology that efficiently recovers cathode metals from discarded batteries, reducing landfill waste and the need for mining. In collaboration with the University of St Andrews and Ecosurety, the process uses an organic solvent in a novel reactor to separate a lithium stream and a mixed metal cathode precursor, lowering costs and energy use while enhancing metal performance.

MagCure

Mag-Cure brought a step-change to electric motor manufacturing for Electric Vehicles by introducing a novel adhesive bonding technology that enabled rapid adhesive curing. It reduced production costs and time, eliminating bottlenecks, and provided a de-bondable solution for end-of-life and quality control.

Full Services & Test Methods

Accelerated Weathering Testing Industries	Xenon Methods
Automotive	JIS D0205
Automotive	GM Opal GME 60292
Automotive	Volvo VCS 1027
Automotive	Volvo VCS 1026
Automotive	Nissan NES M0135
Automotive	Toyota TSL 0601G
Automotive	Toyota TSL 3600G
Automotive	SAE J2412
Automotive	SAE J2527
Automotive	Mercedes DBL 5555
Automotive	Volkswagen PV1303
Automotive	Volksawagen PV1306
Automotive	Volkswagen PV 3929
Automotive	Volkswagen PV 3930
Automotive	Ford FLTM EU BO 050-1
Automotive	Ford FLTM B0116
Automotive	Peugeot/Renault PSA D47 1431
Automotive	Peugeot/Renault PSA D47 1122
Automotive	Fiat 50451
Automotive	Porsche DIN 75202
Automotive	Honda HES D6601
Automotive	Kia MS300-35E
Automotive	PF-1 1365

Accelerated Weathering Testing Industries	Xenon Methods
Automotive	VDA 75202
Automotive	ISO 11341
Automotive	ISO 105-B06
Automotive	Daimler DBL 7399
Automotive	General Motors GMW 14660
Automotive	General Motors GMW 14162
Automotive	General Motors GM 9125P
Automotive	General Motors GMW 14170
Automotive	ASTM D7356
Automotive	ASTM D7869
Plastics/Automotive	ISO 4892-2
Textiles	ISO 105 B02
Textiles	ISO 105 B04
Textiles	ISO 105 B06
Textiles	ISO 105-B07
Textiles	AATCC TM 16
Textiles	AATCC TM 169
Textiles	Adidas TM 5.11
Textiles	GB/T 8427
Textiles	GB/T 8431
Textiles	GB/T 16991
Textiles	ISO 2454
Textiles	M&S C9
Textiles	M&S C9A

Accelerated Weathering Testing Industries	Xenon Methods
Textiles	CPAI-84
Geotextiles	ASTM D4355
Plastics	JIS K 7350-2
Plastics	DIN EN513
Plastics	ASTM 2565
Plastics	ASTM D4459
Plastics	ASTM D5071
Plastics	ASTM D6662
Plastics	EH-438-2
Plastics	GB/T 16422.2
Plastics	GB/T 29365
Plastics	UL 1581
Rubber	ASTM D750
Rubber	ASTM D925
Rubber	ASTM D1148
Rubber	ISO 3865
Rubber	ISO 4665
Rubber	GB/T 3511
Paints and Coating	ISO 11341
Paints and Coating	ISO 16474-2
Paints and Coating	ASTM D3451
Paints and Coating	ASTM D3794
Paints and Coating	ASTM D6577
Paints and Coating	ASTM D6695

Accelerated Weathering Testing Industries	Xenon Methods
Paints and Coating	GB/T 1865
Paints and Coating	MIL-A-8625-F
Paints and Coating	MPI: #113
Paints and Coating	MIL-P-14105-D
Paints and Coating	JIS K 5600-7-7
Paints and Coating	MS 133 Part F14
Paints and Coating	IRAM 1109-B14:2008
Paints and Coating	JDQ-533
Paints and Coating	#85 FMR
Inks	ISO 11798
Inks	ISO 12040
Inks	ISO 18909
Inks	ASTM 6901
Inks	ASTM D3424
Inks	ASTM D4303
Inks	ASTM D5010
Inks	ASTM F2366
Inks	GB/T 22771
General	IEC 68-2-9
General	ISO 4892-1
General	ASTM G155
General	MIL-STD-810G
General	GB/T 16422.1
Packaging	ASTM D6551

Accelerated Weathering Testing Industries	Xenon Methods
Roofing	ASTM D1670
Roofing	ASTM D4637
Roofing	ASTM D4798
Roofing	ASTM D4811
Roofing	ASTM D5019
Roofing	ASTM D6083
Roofing	ASTM D6878
Adhesives & Sealants	ASTM C732
Adhesives & Sealants	ASTM C734
Adhesives & Sealants	ASTM C793
Adhesives & Sealants	ASTM C1257
Adhesives & Sealants	ASTM C1442
Adhesives & Sealants	ASTM C1519
Adhesives & Sealants	ASTM C1251
Adhesives & Sealants	ASTM C1501
Adhesives & Sealants	ASTM C1184
Adhesives & Sealants	ASTM D904

Accelerated Weathering Testing Industries	QUV Methods
General/Plastics	ISO 4892-3
Coated Metals	EN13523-10
Photodegradable Plastics	ASTM D5208
Forensic Marking Product	PAS 820
General	ASTM G151
Non-metallic Materials	ASTM G154
Automotive Exterior Materials	SAE J2020
Plastics	ASTM D4329
Paints and Coatings	ASTM D4587
Paints and Coatings	EN 927-6
Paints and Coatings	EN 1062-4
Paints and Coatings	ISO 11507
Paints and Coatings	ISO 11997-2
Paints and Coatings	ISO 15110
Paints and Coatings	ISO 16474
Paints and Coatings	ISO 16474-3
Paints and Coatings	ISO 16474-3
Roofing	ASTM D4434
Roofing	ASTM D4799

Accelerated Weathering Testing Misc	Test Methods
Solar radiation on equipment and components	BS EN 60068-2-5
McLaren Paint Performance, Durability and Application - Automotive	McLaren MSL .10.23.0007
Ophthalmic optics — Uncut finished spectacle lenses	ISO 8980-3
Furniture - effects of light indoor	EN 15187
Wire and Cable Test Method	UL 2556
Coating Materials for Exterior Wood	EN 927 - 6
Safety Glazing Motor Vehicles	ANSI Z26.1

Environmental Testing	Standard Method
Evaluate the Weather Performance of Materials (Q-SUN Xenon Arc Chamber)	ISO 4892
Environmental Testing of Materials, Constant and Cyclic (high and low temperature) - Temperature Humidity	BS EN 60068
Environmental Testing of Materials, Constant and Cyclic (high and low temperature) - Temperature Altitude	BS EN 60068
Environmental Testings of Materials, Constant and Cyclic (high and low temperature) - Sealing Immersion Test	BS EN 60068
Thermal Shock	BS EN 60068
Vibration	BS EN 60068
Shock	BS EN 60068
Absorption Tests in Various Solutions and Temperatures	In-house Method
Chemical Degradation Tests	ISO 4433/13575
Particle Size Analysis in Liquid (light scattering)	ISO 13320
PH Meter of Soil and Solutions	In-house Method

Material Characterisation	Standard Method
Determination of average molecular weight and molecular weight distribution of polymers	ISO 16014-4
Molecular Weight Distribution	PAS 9017/ASTM D6474
Volatile - Moisture Loss	ISO 6964:2019 - Method C
Weight loss	BS EN ISO 11358:2014
Thermal Properties & Stability	**Standard Method**
Glass Transition Temperature	ISO 11357-2/ASTM E1356
Gross Heat of Combustion/Calorific Value	ISO 1716/ ASTM D240
Meltng & Crystallisation Temperature	ISO 11357-3/ASTM D3418
Oxidation Induction Time	ISO 11357-6/ASTM D3895
Material Composition & Identification	**Standard Method**
Carbon Black Content	ASTM E1131-08
Carbonyl Index	PAS 9017
Characteristic IR Spectrum	ISO 10640
Compositional Analysis by Thermogravemetry	ASTM E1131-08
GC-MS Impurity Profiling	In-house Method
Heavy Metals by ICP-OES	In-house Method
RoHS testing	In-house Method

Biodegradability Test/End-of-life Environment	Standard Method
BS EN 13432 — Requirements for packaging recoverable through composting and biodegradation	ISO 13432/ASTM D6868/D6400
COMPOST ENVIRONMENT	
BS EN 14995 Plastics - Evaluation of compostability	BS EN 14995
Aerobic Biodegradation in Industrial Compost	ISO 14855
Aerobic Biodegradation of plastic materials under controlled composting conditions	ASTM D5338
Home Compost	AS 5810
MARINE/AQUEOUS ENVIRONMENT	
Activated Sludge Respiration Inhibition Test	OECD 209
Ready Biodegradability - in an aerobic aqueous medium	OECD 301 F
Biodegradability in Seawater	OECD 306
Ultimate Biodegradability - in an aerobic aqueous medium	ISO 14851
Ultimate aerobic biodegradability of plastic materials in an aqueous medium	ISO 14852
Aerobic Biodegradation of Plastic Materials in the Marine Environment	ASTM D6691
Determination of the aerobic biodegradation of plastic materials exposed to seawater	ISO 23977
Biochemical Oxygen Demand 5	BOD 5
Biochemical Oxygen Demand 7	BOD 7
FLUSHABILITY ENVIRONMENT	
Aerobic & Anaerobic Biodisintegration	EDANA FG505/506 Part A

Biodegradability Test/End-of-life Environment	Standard Method
SOIL ENVIRONMENT	
Aerobic Biodegradation in Soil	ISO 17556
Disintegration Testing	ISO 16929/20200/ASTM D6868
ANAEROBIC ENVIRONMENT	
Ultimate anaerobic biodegradation under high-solids anaerobic-digestion conditions	ISO 15985
MISC	
Biodegradation of polyolefins in an open-air terrestrial environment	PAS 9017

Density	Standard Method	
Density of Plastics-Immersion Method-Specific Gravity	ISO 1183-1	ASTM D792
Relative Density	ISO 1183	ASTM D792
Density - Pycnometer Method	ISO 1183-1	ASTM D792
Density - Hydrometer Method	ISO 649	
Bulk Density	ISO 60	ASTM D1895

Environmental Stress Cracking	Standard Method
Full Notch Creep Test (in a chemical agent from 20-95oC)	ISO 16770
Bell Telephone Test (Stress crack resistance)	ASTM D1693
Pin Impression Test	ISO 13575
Strain Hardening on Pipe Materials	ISO 18488
Cracked Round Bar Test	ISO 18489
Cone Test	ISO 13480
Stress Crack Resistance - Bend Strip Method	ISO 22088

Flammability Testing	Standard Method
Flammability of Plastic Materials	UL94
Performance Requirements of Non-Decorated Plastics	STJLR.51.5262
Glow Wire	IEC 60695 - 2 -11
Single-flame Source Test	ISO EN 11925-2
Rate of Burning	ASTM D635
Comparative Burning Characteristics of Solid Plastics in a Vertical Position	ASTM D3801
Comparative Burning Characteristics and Resistance to Burn-Through of Solid Plastics Using a 125-mm Flame	ASTM D5048
Flammability Characteristics of Nonrigid Solid Plastics	ASTM D4804
Horizontal Burning Characteristics of Cellular Polymeric Materials	ASTM D4986
Needle-flame Test	BS EN 60695-11-5
50 W Horizontal and Vertical Flame Test	BS EN 60695-11-10 Method A & B
500 W flame Test	BS EN 60695-11-20
Cellular Plastics - Horizontal Burning Characteristics of Small Specimens Subjected to a Small Flame	ISO 9772
Plastics - Burning Behaviour of Thin Flexible Vertical Specimens in Contact with a Small Flame	ISO 9773
Automotive - Burning Behavious of Interior Materials	ISO 3795

Material Analysis	Standard Method	
Ignition Material Loss-Ash Content	ASTM D2584/D5630	
Rubber Compounding Ingredients - Carbon Black - Determination of Ash	BS ISO 1125	
Carbon Black	ISO 6964	
Content Carbon Black Dispersion	ISO 18553	
Pigment Dispersion	ISO 18553	
Flammability of Plastic Materials-UL94	ISO 9773	
Tear Resistance of Films (Elmendorf)		ASTM D1922
Determine the Haze and Luminous Transmittance of Transparent Plastics	ISO 14782	ASTM D1003
Abrasion Wear Analysis of Plastics (Taber Abrasion)	ISO 23794	ASTM D4060
Colour Analysis of Plastics	ASTM D6290, CIE Lab, Hunter Lab	
Stereo-Microscopy	In-house Method	
Scanning Electron Microscopy	In-house Method	
Characterisation of Materials via Energy Dispersive X-ray Spectroscopy	In-house Method	
Characterisation of Plastics via FTIR	ASTM E168/E1252	
Assessing Polymer Ageing by FTIR	ISO 10640	
Surface Roughness	ISO 4287	ASTM D7127-17
Surface Analysis of Plastics via Atomic Force Microscopy	In-house Method	

Mechanical Properties - Static - Short Term	Standard Method	
Tensile Test	ISO 527-1/527-2	ASTM D638
Flexural Test (3 or 4 point bend test)	ISO 178	ASTM D790/D6272
Tensile Lap-Shear Strength - Adhesives	BS EN 1465	
Bend Test - Timber Structures	BS EN 789	
Compression Tests	ISO 604	ASTM D695
Compressive Strength - Hardened Concrete	EN 12390 - 3	
Peel Test	GIS/WIZ/ISO/ASTM	
Peel Test - Rubber Adhesion	ASTM D429	
Peel Resistance of Joints - Plastic and Rubber	BS EN 12316-2	
Shear Testing	ASTM D732	
Lap Shear Test	ISO 4587	ASTM D5868
Interlaminar Shear and Modulus	ISO 19927	ASTM D2344
Screed Testing	BS EN 13892-2	
IZOD Impact Test	ISO 180	ASTM D256
Charpy Impact Test	ISO 179	ASTM D6110
Instrumented Drop Impact	ISO 6603-2	ASTM D5420
Dart Impact	ISO 7765	ASTM D1709
Ball Drop Testing - Various Material Sheets	PV3905	
Ball Drop Testing - Automotive Plastics for Exterior Components	PV3989	
Linear Elastic Fracture Mechanics (LEFM)	ISO 13586	
High Speed Fracture Mechanics	ISO 11673	
Determination of Hardness- Shore A/D	ISO 868	ASTM D2240
Rockwell Hardness	ISO 2039	ASTM D785

Mechanical Properties - Static - Long Term	Standard Method	
Creep Behaviour, Tensile	ISO 899-1	ASTM D2990
Compressive Creep	In-house method	
Creep Behaviour, Flexural (3-point method)	ISO 899-2	ASTM D2990
Compression/Cyclic Compression - Thermal Insulation Products for Buildings	B3 EN 826	
Compressive Creep - Thermal insulating products	BS EN 1606	
Determination of Fracture Toughness Properties of pipes, C-Ring	ISO 11673	
Storm Crate Compression Test	BBIA	
Fibre-reinforced Plastics - Determination of Fatigue Properties Under Cyclic Loading Conditions	ISO 13003	
Determination of tension-tension fatigue crack propagation - Linear elastic fractur mechanics (LEFM) approach	ISO 15850	

Processing	
Melt Mixing Using Brabender	CNC Routing
Melt Mixing Using Prism Extruder	Die Stamping (Hydraulic Stamp)
Injection Moulding	Cutting Operations - Twin Blade Saw, Band Saw , Power Saw
Hot Pressing	Notching - Milling or Hydraulic Press
Semi Positive Moulding 25mm thick max	Sample Conditioning - Controlled Temperature and Humidity
CNC Milling	

Pipes	Standard Method
Ring Stiffness and Resistance to Structural Damage	BS 5480
Pipes: Tensile Properties	ISO 6259
Pipes: Tensile Properties PE/PP	ISO 6259-3
Pipes: Tensile Properties -PVC uPVC	ISO 6259-2
Peel Decohesion Tests on Electrofusion Pipe Welds	ISO 13954
Crushing Decohesion Test	ISO 13955
Pull tests on Electrofusion Pipe Welds	ISO 13954
Pull tests on Butt Fusion Pipe Joints	ISO 13953
PVC Pipes, Fusion of Crystallites	ISO 18373-2
PVC Pipes, Processing Temperature	ISO 18373-1
Oxidation Induction Time, OIT (static and dynamic)	ISO 11357-6
Carbon Black Content	ISO 6964
Carbon Black Dispersion	ISO 18553
Conduit Systems Buried Underground	BS EN 61386-24
Compression Testing Abestos Pipes	AS1012
Technical Specification for Plastic Ducts for Buried Electric Cables	ENATS 12-24

Product Tests	Standard Method
Testing of Dental Plastics	ISO 20795
Reusable Sharps Containers	ISO 23907 - 2

Thermal Analysis	Standard Method	
Determination of Temperature and Enthalpy of Melting-Crystallisation	ISO 11357-3	ASTM E2253/D3418
Determination of Glass Transition Temperature	ISO 11357-2	ASTM E1356
Determination of Specific Heat Capacity	ISO 11357-4	
Determination of Crystallisation Kinetics	ISO 11357-7	ASTM E2253/D3418
Oxidation Induction Time, OIT (static and dynamic)	ISO 11357-6	ASTM D3895
Thermogravimetric Analysis of Plastics, TGA (inorganic, volatile, water)	ISO 11358	ASTM E1131
Determination of Dynamic Mechanical Properties, DMA	ISO 6721	ASTM D5279/D7028
Heat Deflection/Distortion Temperature, HDT	ISO 75	ASTM D648
Vicat Softening Temperature	ISO 306	ASTM D1525
Heat/Ageing of Plastics in Air Convection Ovens (24-250˚C)	In-house Method	

Rheology	Standard Method	
Melt flow Rate	ISO 11313	ASTM D1238
Cone and Plate Rheometry	In-house Method	
Dynamic Viscosity	In-house Method	
Intrinsic Viscosity	ISO 1628-1/2/3	ASTM D4603
Capillary Rheometry	ISO 11443	ASTM D3835

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