



**FTIR Microscopy** is invaluable for identifying the chemical composition of polymer materials at a microscopic level, helping detect contaminants or degradation in polymers used in medical devices and packaging.

**SEM (Scanning Electron Microscopy)** provides high-resolution images of polymer surfaces and can detect structural issues such as cracks, voids or defects, which are critical in understanding failure modes for medical devices and packaging materials.

**GCMS (Gas Chromatography-Mass Spectrometry)** is used to analyse volatile compounds in polymers, identifying additives, contaminants, or degradation products, and ensuring the safety and integrity of polymers, especially in critical applications like medical devices and food packaging.

**DSC (Differential Scanning Calorimetry):** DSC analyses the thermal properties of polymers, such as glass transition and melting points, crucial for assessing material stability, thermal performance, and suitability for medical or packaging applications. It also critically aids in understanding the material's behaviour under different temperature/processing conditions.



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**CLIENT WITH  
MATERIAL/  
PRODUCT ISSUE**

e.g. Failure Investigation  
Contamination Investigation  
Quality Assurance Issue



**01**

CONSULTATION



**02**

EXPERIMENTAL PLAN



**03**

APT PERFORM TESTS



**BULK PROPERTY ASSESSMENT – BASE CHARACTERISTICS**  
FTIR / FTIR-mic SEM/EDX DSC TGA DMTA

MFI Mechanical (Tensile / Creep / Flexural / Impact Properties)



**FINE PROPERTY ASSESSMENT**  
GCMS / pyGCMS GPC (trip-det) XRD Contact Angle Goniometry

Capillary / Parallel Plate Rheology Viscosity Nano-TA / CTE LCMS



**FUNCTIONAL PROPERTY ASSESSMENT**

Bespoke Product Test Setup | Accelerated Weathering Shelf-Life | Ageing Studies

Followed by metric agreed prior to the study  
(Mechanical Properties Colourimetry Other Product Performance-Related)

**CONFIDENTIAL TECHNICAL REPORT**



CONSULTANCY  
WITH CLIENT  
ON OUTCOME



OR



FURTHER  
FUNDING  
OPPORTUNITIES



**Chemical Testing Suite**

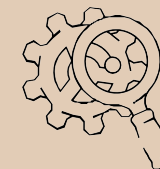
- FTIR / FTIR-microscopy (Single-Point and Mapping Analysis)
- Scanning Electron Microscopy (SEM) with EDAX Elemental Detection
- GCMS / Pyrolysis GCMS (Contaminants, Additives, Degradation Profile)
- Gel Permeation Chromatography (High Temp GPC and Triple Detection)
- X-Ray Diffraction (XRD)
- Contact Angle Goniometry / Surface Free Energy
- Liquid Chromatography Mass Spectroscopy (LCMS)

**Thermal Testing Suite**



- Differential Scanning Calorimetry (DSC – Tm, Tg, Crystallinity)
- Thermogravimetric Analysis (TGA – Thermal Stability, % Filler)
- Dynamic Mechanical Thermal Analysis (DMTA – Tg, Loss / Storage Modulus)
- Atomic Force Microscopy (AFM/Nano-TA)

**Physical Testing Suite**



- Mechanical (Tensile / Creep / Flexural / Impact Properties)
- Texture Analysis (Tackiness, Adhesion, Gumminess, Resilience)
- Melt Flow Rheology (MFR)
- Capillary Rheology/ Parallel Plate Rheology
- Brookfield Viscosity
- Packaging Seal Optimisation Testing
- Vicat Softening Point (VSP) / Heat Distortion Temperature (HDT)
- Accelerated Ageing / Shelf-Life Studies
- Accelerated Weathering / External Product Performance
- Colourimetry (Product Colour Profile Changes / Differences)

