

# Polymers Competence Center

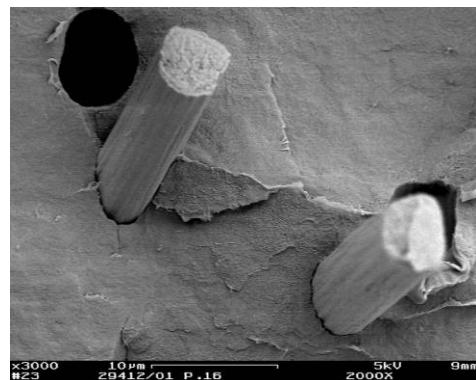
## Characterization, Processing & Simulation Technologies



SOLVAY is an international Group that employs some 29,000 people in 50 countries. Active in three sectors (Chemicals, Plastics and Pharmaceuticals), it is organized in Strategic Business Units and supported by **Competence Centers** (CC) that bring the skills and knowledge strategically important to the Group.

Based in its Brussels Research and Technologies Centre, Polymers CC **combines Analysis, Evaluation, Processing and Simulation knowledge**. It is now open to external customers and partners, allowing non Solvay's industrial actors to access to its first class services and solutions

### More than technical services ... Solutions !



Based on our **experts responsive and cost-competitive suggestions**, full polymer characterization and processing (from the structure determination to the prediction of the processing behavior) **will be proposed to you**, allowing you to progress at best in your project of development.

Indeed, by combining a broad range of analytical and evaluation techniques, we are used to solve problems in **widely different fields** related to chemistry, materials science, materials improvement and analysis, as well as in safety, health or environmental research. As a result, **our know-how has proven its worth** in a large range of areas such as printing, packaging, chemical industries ..., obviously in connection with polymers !

Resulting from our **intensive “everyday practice”**, we can support your research and product optimization and largely help you to **solve production problems**. By **managing an open dialogue** between your experts and ours, and by **translating your problems into the most useful methods** (FT-IR, NMR, TGA-MS, MS, SEM, XRF...), we can **succeed in resolving high specific problems and original issues** such as:



- determine the **properties** and the **composition of competing products**,
- identify and quantify **additives**,
- establish the cause of a **complaint**.

In the polymer processing field, our available support mainly focuses on the melt behavior during the processing phases and on the **prediction of end products properties in real life situation**.

By combining the measurements of experimental properties and the simulation of the processes (or of the applications), **we dramatically reduce the time and the cost of your project developments and give you additional possibilities to protect, store, fine tune or easily share your results**.

Among the most frequently consultancy required, **we are particularly efficient** in:

- **creep measurement** at any temperature with any liquid (including fuel) to establish a non linear creep laws which allows the computation of any long term behavior
- use of the **measured impact properties** of samples to predict the impact properties of the thermoplastic in its final application
- possibilities to **predict the bottle blowing properties** through its tensile viscosity **measurements** and **POLYFLOW computation**
- calculation of the mechanical properties of mineral filled compound and polymer blends
- **prediction** of Polymer characteristics allowing its **mono and bi orientation**
- **3 D analysis** of any products to prepare meshing for any finite element computation, to measure the 3D distortion of end products submitted to external stresses or thermal cycles.



Accreditation Certificate nr 194-Test – According to ISO 17025 Standard. Since 2003, the Polymers Testing & Processing Department complies with the ISO 9001:2000 Quality Standard



# Challenge us by asking support in :

## Organic and inorganic trace determination

- Metals: Inductively Coupled Plasma (ICP) / Mass Spectrometry (MS)
- Anions: ion chromatography
- Volatile species: Gas Chromatography (GC)-MS Head space-GC, Purge &Trap-GC-MS
- Clean room environment

## Surface (and interface) analysis

- Chemical composition
- Elemental analysis: X-ray microanalysis IR (ATR, DRIFT), RAMAN
- Surface energy of liquids and solids: contact angle measurements, surface tension
- Topography, structure, appearance: SEM, optical-, interference-, atomic force microscopy profilometry, gloss measurements, ...

## Polymeric materials characterization

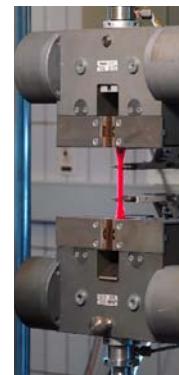
- Molecular structure (branching identification, ...): Nuclear Magnetic Resonance, DSC, tensile melt rheology...
- Composition: IR, NMR, ThermoGravimetry, elemental analysis, H<sub>2</sub>O and volatile content, ...
- Additive and quantification : Organic Analysis, Thin Layer Chromatography, Liquid Chromatography (HPLC), GC, IR, ...
- "De-engineering" (competitive analysis): multidisciplinary
- Morphology: optical, electron, atomic force microscopy, XRay Diffraction
- Phase dispersion (fibers, pigments, nanoparticles,...): optical and electron microscopy, image analysis,
- Physical chemical properties: thermal analysis, viscosity, conductivity, ...
- Multilayer characterization : IR-, Raman-, Electron-, optical microscopy, permeability
- All mechanical, rheological, and electrical Properties
- All optical and acoustic properties

## Defect identification

- Fish eyes: InfraRed (IR)-, Raman-, optical microscopy
- Organic contamination: IR-, Raman microscopy
- Inorganic contamination: IR-, Raman microscopy
- X-ray microanalysis (+ Electron Microscopy TEM, SEM, EDX)
- Morphological defaults (fold, cracks, ...): optical microscopy, TEM, SEM

## Polymer processing equipment

- Injection, extrusion (pipe, films...), blow molding, compounding (twin screw extruders), film processing, blown film extrusion lines, filament production lines, extrusion foaming, Injection foaming, Internal and external mixers...



## Modeling and optimization,

- Solid state simulations (ABAQUS),
- Extrusion simulation (POLYFLOW and FLUENT)
- Injection simulation (MOLDFLOW)

## Polymer welding (LASER, HF, thermal welding)

## Our strengths

**Customer orientation** resulting from the broad diversity of the areas, requests and profiles of our clients.

Experience with a wide range of products and techniques, daily processed by our **team of experts**

**"Top performance" equipments** and tools to keep **competitiveness** and **reactivity**

**Confidentiality**, respect of engagements, done in allowed time.

Working environment according to a quality policy: (accreditation **Belac** ISO17025 for 27 methods - Certificate nr 194-Test) and **ISO9000** standard (BVQI)

Want to know more about us? Contact :

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