## ADVANCED SOLUTIONS FOR POLYMERS AND PLASTICS

# BETTER INSIGHTS FOR BETTER POLYMERS UNDER ONE ROOF

The Polymer Market consists of a huge diversity of manufacturers of industrial products running many different processes yet still facing similar challenges. There is more and more pressure to achieve high product quality and reduce costs in order to stay one step ahead of the competition.

With our instruments and expertise, we can help you:

- Save money and ensure effective quality control
- Streamline your processes for outstanding operational efficiency
- Implement cost effective solutions by reverse engineering

### **Polymer Processes**

Resin	Resin	Compound	Compound	Product	Recycling
Development	Manufacture	Development	Manufacture	Forming	
Optimization of materials to ensure robust downstream applications Optimization of reaction times, end points and curing processes to reduce costs Presence of residual monomers	Ensuring resins meet agreed specifications  QC of in-process and final products; determination of crystal orientation	ID of chemical composition and interactions of additives  Accelerated life testing and biodegradability studies  Study effects of chemical or environmental degradation  Optimization to improve flow, strength and stiffness  Poly-dispersion analysis	ID of raw materials and QC of finished product to ensure correct mix and distribution of additives  Reverse Engineering	QC of raw materials and finished products; troubleshooting product defects Optimization of extrusion/molding to minimize energy consumptions, reduce scrap and ensure safety	Classification of materials for recycling and disposal





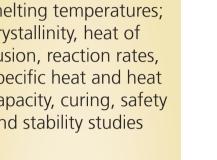
### Solutions for...

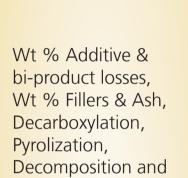
- Packaging film manufacturers
- Tire and rubber industries
- Plastic goods and components manufacturers
- Paint and resins manufacturers
- Automotive, aviation, space and defense
- Academics and research institutions

### Solutions for Polymers focused on providing more insight into product performance and process optimization

Material Science is becoming increasingly important, new technologies and applications make it easier to meet your daily challenges and regulations in a more cost efficient way. Our comprehensive portfolio of thermal analysis, molecular spectroscopy, chromatography and hyphenated techniques is the ideal choice for ensuring the quality and reliability of polymers.

Glass transition & melting temperatures; crystallinity, heat of fusion, reaction rates, specific heat and heat capacity, curing, safety and stability studies





Stability studies

Identify and Quantitate organic molecules and compounds Understand chemical & physical composition of laminates & adhesives Troubleshoot chemical of occlusions Identify orientation of molecules

Volatile compounds in packaging material

**Differential Scanning Calorimetry** 





DSC 8000/8500

#### **Thermogravimetry**



STA 6000/8000



TGA 4000



TGA 8000

**Molecular Spectroscopy FTIR & FT-NIR / Chemical Imaging** 



Spectrum Two<sup>™</sup>



Frontier<sup>™</sup> Spotlight 400 FT-IR

#### **Gas Chromatography/Mass Spectrometry**



TurboMatrix™ Headspace & Thermal Desorber



Clarus® GC, Clarus® SQ 8 GC/MS

Modulus, stiffness, damping, crystalline, alpha and beta transitions, glass transition & melting temperatures

DMA 8000

**Hyphenated Techniques** 

**Mechanical Analysis** 

Identify and quantitate evolved gases in resins and compounds

Reflectance,

transmission and absorption measurements for color, HAZE, turbidity, aging, coatings, glass and

solar cells



#### **Liquid Chromatography/Mass Spectrometry** Identify and quantitate additives



Altus<sup>™</sup> HPLC

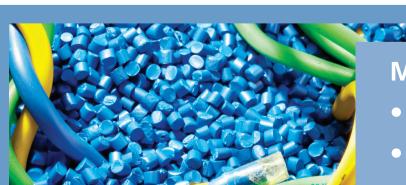


TMA 4000



Molecular Spectroscopy UV/Vis & UV/Vis/NIR

LAMBDA 650/750/850/950/1050



#### MULTIPLE TECHNIQUES - MULTIPLE EXPERTISE FROM ONE COMPANY

- For performing QA/QC applications
- For studying processes in polymers
- For research & development

