thermo scientific

Ensuring quality and safety of polymers

Polymers and related plastic materials have become part of our daily lives, being used in various products and industrial processes. There is growing demand for high performance polymers which also respect the environment, recyclability, safety and quality compliance.

Their physical and chemical properties are critically dependent on their elemental and structural composition. Different spectroscopic and material characterization techniques are usually employed to develop, industrialize and assure their quality and safety depending on the application. In particular, X-ray Fluorescence (XRF) is ideally suited to analyse and quantify various elements down to sub-ppm levels (of additives or contaminants), some of which are regulated to comply with different norms. X-ray Diffraction (XRD), on the other hand, provides much needed structural information such as polymorphism, % crystallinity and crystallite size of the polymers with a view to ensure their structure-property relationship.



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Top list of polymer additives

- Accelerants
- Anti-degradants
- Anti-foams
- Anti-oxidants
- Anti-ozonates
- Blowing agents
- Coupling agents
- Cross linking agents

- Fillers
- Flame retardants
- Plasticizers
- Processing aids
- Retarders
- Stearates
- UV stabilizers

Thermo Scientific XRF and XRD solutions for polymers and related chemicals



Thermo Scientific[™] ARL[™] OPTIM'X Routine WDXRF Spectrometer

- Can handle solids, granules and loose powders of polymer materials
- High resolution and sensitivity for light elements down to sub-ppm levels
- Lowest cost per analysis (minimal peripheral dependence)
- Ideally suited for master batches and routine QA/QC of production samples and unknowns

Thermo Scientific[™] ARL[™] QUANT'X High-Performance EDXRF Spectrometer

- Convenient for rapid screening and fingerprinting of additives and contaminants in polymers
- Highly flexible sample handling for all forms of polymer samples including films and coatings
- Integrated Thermo Scientific[™] UniQuant[™] Software for elemental quantification of polymers of unknown chemistry





Thermo Scientific[™] ARL[™] PERFORM'X Advanced WDXRF Spectrometer

- Highest sensitivity and lowest limits of detection across the periodic table including critical trace elements in polymers
- Bulk analysis as well as advanced elemental mapping and spotting down to 0.5 mm
- Perfect solution for routine, R&D and contract labs with demanding quantitative polymer analysis
- Fully automatable for unattended batch or continuous operation

Thermo Scientific[™] ARL[™] EQUINOX 100 Real-Time X-Ray Diffractometer

- Bench-top powder XRD system with convenience and speed for structural analysis of polymers
- Full pattern diffraction data for fingerprinting or screening of incoming materials or production batches
- Determination of polymorphism, % of crystallinity, crystallite size and stability of formulations
- Reflection or transmission XRD for bulk or thin films of polymer materials

Find out more on X-ray solutions at **thermofisher.com/xray** and on our broader portfolio at **thermofisher.com/polymers**

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