

The Age of Solid-State Detectors for XRF and XRD Analysis

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PANalytical provides solutions for the chemical (which and how much of certain elements) and structural (in what molecular structure) analysis of a wide variety of materials. Our customers can be found in virtually all markets including building materials, metals, mining, food, pharma, cosmetics, polymers, oils, plastics, thin film metrology, nanomaterials and many more in industries and research.

Our solutions are based upon analytical X-ray technologies like X-ray diffraction (XRD) and X-ray fluorescence (XRF) spectrometry. Over the last two decades PANalytical has introduced a number of solid-state detectors in a range of instruments as an essential part for performance improvement.

Solid-state detectors are the enabling technology for the energy-dispersive XRF (EDXRF) spectrometry where instrument performance is directly linked to detector properties. One- and two-dimensional XRD analysis is enhanced and enabled by the use of stripped and pixelized sensors linked to the dedicated application-specific integrated circuits (ASIC) for sensor readout.

Main performance drivers for future detectors are the improvements in energy resolution such as: count-rate capability, detection area, detection efficiency and radiation hardness. Detectors used for XRD analysis have an extra demand of good spatial resolution. These requirements are universal for all X-ray detectors, but the applicable solution is determined by the underlying technology.

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