The Application of Micro-Scale Analysis Tools in Industrial Problem Solving

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Detecting, testing, preventing, and controlling failure mechanisms in the manufacturing and production realm are key to ensuring reliability of commercial and consumer products.

Micro-Scale analytical instruments are universal and important tools to aid in attaining that goal.

Characterization and identification of micron and submicron size particles are essential for understanding and managing certain manufacturing processes.

The focus on achieving manufacturers' goals, such as designing, generating and releasing quality products with consistent, reliable performance within a reasonably competitive price range, requires careful planning and proper method practices along with a systematic engineering approach.

The objective of this presentation is to describe and demonstrate the purpose and value of SEM/EDS, FT-IR, Raman and other non-destructive, micro-spectroscopic instruments, as they provide valuable information when identifying materials' chemical composition and structure while solving manufacturing problems and maximizing quality assurance.

My presentation will classify, compare, and contrast the advantages and limitations of the most common micro-scale analytical instruments, thereby providing the audience with a convenient user-selection guide.

Through specific case studies, I will demonstrate the practical applications of these Micro-Scale Analysis Tools for problem solving.

I will also present the spectroscopists' challenges regarding data acquisition and results interpretation to achieve accurate and meaningful results.

Furthermore, my talk will reveal how the knowledge of the specific, critical product performance parameters is essential and should determine the proper selection from the instrument choices available.

We will then establish how a logical approach for selecting the most suitable micro-scale instruments is vital for maximizing benefits and results. This methodology will be illustrated with the aid of micro-graphs, spectral data, and photographs.

My presentation will continue with providing the audience a fresh understanding of the many micro-scale analytical tools currently available along with their development over the years.

For a conclusion, I will demonstrate how the consistent and proper utilization of such tools will result in minimizing product flaws, thereby preserving a good business reputation while reducing the high associated costs when unforeseen failures do occur.

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