# DART (DIRECT ANALYSIS IN REAL TIME)

## Analytical Datasheet

| Used For | • Produces a time-of-flight molecular ion mass spectrum of a sample  
  • Useful as a screening tool for samples to be further confirmed by other chromatographic techniques |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Advantages | • Analyzes samples in air  
  • Can analyze solids and liquids *in situ* with no sample preparation (e.g., whole pharmaceutical pills, surfaces of wipes, neat liquids)  
  • Instrument parameters can be quickly changed to find optimal conditions for each sample  
  • Analysis time is only minutes per sample |
| Limitations | • Mass spectrum not electron impact and not applicable to typical mass spectra from other chromatographic techniques  
  • Not useful for minerals, metals, or biomolecules  
  • Detection limits not as low as with other chromatographic techniques  
  • Qualitative only |
| Analysis Volume | N/A |
| Sample Requirements | • Handle samples with gloves to minimize detection of oils and fatty acids.  
  • Package samples in glass or foil; plastic containers will transfer several sensitive compounds to samples.  
  • Submission of target compounds along with samples is strongly encouraged.  
  • Large samples can be accommodated; smaller samples can be in the 100 mg or µL size range. |
| Information Provided | • Mass spectrum of ionized components from sample  
  • Identification of sample components |
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ISO/IEC 17025:2005 A2LA Accredited | cGMP Compliant | FDA Registered | DEA Registered
Our capabilities include:

ISO Class 5 Cleanroom
• Particle isolation and sample preparation from a wide variety of matrices
• Risk of outside contamination is minimized

Light Microscopy
• Particle identification by optical, morphological, physical and thermal properties
• Imaging and photomicrography
• Particle size measurements
• Analysis and identification of fibers, dust, food, minerals, pigments, glasses and combustion products and more

Scanning Electron Microscope and X-ray Analysis (SEM, EPMA)
• Secondary electron imaging for high resolution imaging
• Backscattered electron imaging for compositional variation and topographic imaging
• EDS and WDS attachments for elemental analysis

Transmission Electron Microscopy (TEM)
• High resolution imaging and analysis of materials
• Morphological, elemental, crystallographic and electronic state
• Analysis of pure and mixed phases, multiple components, nanocomposites
• Analysis of samples including polymers, minerals, pharmaceuticals, metals and ceramics

Infrared and Raman Micro-Spectroscopy
• Identification of organic and inorganic materials
• Phase identification, polymorphism, crystallinity
• Analysis of samples including contaminants, polymers, coatings and inks, fibers, forensic evidence and art and archaeology

X-ray Diffraction (XRD)
• Phase determination for inorganic and many organic materials
• Revealing mixed compounds in a single sample
• Analysis including compound identification, polymorphism, corrosion identification, asbestos, pigment identification and relative degree of crystallinity

X-ray Photoelectron Spectroscopy (XPS or ESCA)
• Surface analysis of solids for elemental and chemical information
• Effective for very thin (<5nm) surface films; thicker films can be analyzed with depth profiling
• Analysis of samples including thin surface films and contamination on metals, ceramics, glasses, plastics, paper and other materials

Direct Analysis in Real Time – Mass Spectrometry (DART–MS)
• Time-of-flight molecular ion mass spectrometry
• Analysis of samples at atmospheric conditions without sample preparation
• Successfully analyzes materials in liquids, extracts, and solids; and on surfaces
• Identification of organic compounds based on their mass spectra

www.mccrone.com/materials-analysis