HERCULES

Analytical Customer Applications

Identifying the problem is the first step toward a solution.

At Hercules Paper Technologies, we utilize our comprehensive array of functional, process and water management chemicals and technologies to integrate solutions throughout your mill. Our on-site management approach, coupled with our application experts and research scientists, enables us to create a synergy of mill-wide solutions that increases your ability to compete.

Rapid analysis and identification beyond field-based methods

There is an endless variety of contaminants that can cause runnability and quality problems in pulp and papermaking operations. Typical problems can include slime, scale, pitch, stickies, a spot or hole in the sheet, or a contaminant filling a felt. The Hercules Analytical Customer Applications team provides rapid analysis and identification of these contaminants beyond what may be accomplished with field-based methods. Hercules employs an experienced staff of analytical chemists, microbiologists and technicians, supported by sophisticated testing facilities, dedicated to addressing this need.

Deposit Analysis

Using advanced organic, inorganic and microbiological analysis techniques, the Deposit Analysis group identifies components of complex process and functional problems such as deposition, scaling, contamination, and defects. Some techniques used include:

- Infrared Spectrometry and Microscopy
- Scanning Electron Microscopy, with Energy Dispersive Spectrometric Detection
- Optical Microscopy
- Pyrolysis-Gas Chromatography/Mass Spectrometry
- Gas Chromatography/Mass Spectrometry, and Gas and Liquid Chromatography
- Inductively Coupled Plasma-Atomic Emission Spectrometry
- Thermogravimetric Analysis

Scanning Electron Microscopy

Fluid Analysis

A thorough knowledge of water chemistry in the papermaking process allows for the anticipation and prevention of potential scaling, deposition, corrosion and other problems. Some of the techniques used by the Fluid Analysis group include:

- Inductively Coupled Plasma-Atomic Emission Spectrometry
- Ion Chromatography
- Automated Titrimetric Analyses
- UltraViolet-Visible Spectrophotometry
- Total Organic Carbon Analysis
- Total Nitrogen Analysis
- Coulometric Titration of Adsorbable Organic Halogens (AOX)

Fluid and deposit analysis capabilities are available globally. Timely analytical results are transmitted electronically to sales representatives for fast interpretation and problem-solving recommendations.

ANALYTICAL LABORATORY CAPABILITIES

Instrumentation	Acronym	Typical Uses
Auto-titration		Acidity, Alkalinity, Chelant.
Carbon Analysis • Organic Carbon • Total Carbon • Inorganic Carbon	 TOC TC TIC	General Carbon Content.
Ion Chromatography	IC	Anions, Cations, Carbohydrates.
Inductively Coupled Plasma- Atomic Emission Spectrometry	 ICP-AES	 Trace Metals (Multielement).
Microwave Digestion		Sample Preparation and Isolation. High Temperature and Pressure.
Ultraviolet-Visible Spectrophotometry	UV-VIS	Colorimetry.
Nitrogen Analyzer		Nitrogen Content in Fluids and Paper.
Infrared Spectrometry • Diamond ATR Sampling • Micro Diamond Anvil Cell • IR Microprobe	IR	Identification of Deposits, Extracts, Solutions, Sheet Defects and Particles.
Gas Chromatography • Flame ionization detection • Electron capture detection • Nitrogen-phosphorus detection • Programmable temperature vaporization	GC FID ECD NPD PTV	Volatile Organic Compounds, Wood Extractives, Contaminants, Sizing Component Identification, Odors and Process Waters. Quantitative Analysis of Known Compounds.
Gas Chromatography/ Mass Spectrometry	GC/MS	Volatile Organic Compounds. Qualitative Analysis of Unknown Compounds. Quantitative Analysis of Known Compounds.
Pyrolysis—Gas Chromatography/ Mass Spectrometry • Chemical Ionization • Mass Spectrometry/Mass Spectrometry	P-GC/MS CI MS/MS	Insoluble and/or Non-Volatile Organic Materials. Curie Point Pyrolysis and/or Filament Pyrolysis. Qualitative/Quantitative. Natural and Synthetic Polymers.
Liquid Chromatography	LC, HPLC	Non-Volatile, Soluble Organic Compounds. Quantitative Analysis of Known Compounds.
High Temperature Gel Permeation Chromatography	GPC	Polymer Molecular Weight Comparisons. Aqueous and Organic Media.
Microbiological Analysis	MB	Aerobes and Anaerobes, Culturing, Identification, Assay and Toxicant Studies, Bacteria, Fungi, and Spore Formers.
Optical Microscopy	OM	Chemical, Microbiological and Physical Analyses. Flat Field, Stereo, and Fluorescence. Digital Image Capture.
Scanning Electron Microscopy • Energy Dispersive Spectrometry • Back Scatter Electron Imaging • Secondary Electron Imaging	SEM SEM/EDS	Chemical, Microbiological and Physical Analyses. Sheet Defects, Fabric Damage, Filler/Coating, Micro-samples, Filler Distribution, Qualitative/Quantitative for Inorganics. High Resolution Imaging, Environmental Chamber for Wet Sample Analysis, Light Element Detector, and Electronic Image Capture and Transmission.
Automated Solvent Extraction	SOXTEC SOXTHERM ASE	Solubility, Sample Preparation and Isolation. Multisample. Automated Multisample, Temperature and Pressure, and Low Yield Pulp Extractives. Multisolvent Extended.
Spot Tests		Variety of Confirmatory Tests for Organics and Inorganics.
Thermogravimetric Analyzer	TGA	Ash Content in Small Samples. Carbonate and Oxalate Content in Defects.
Coulometric Titration	AOX	Quantification of Adsorbable Organic Halogens in Water (Soluble) Samples.

Complete Solutions for Pulp and Paper

Hercules Incorporated
Paper Technologies and Ventures Group

www.herc.com/papertechnologies

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