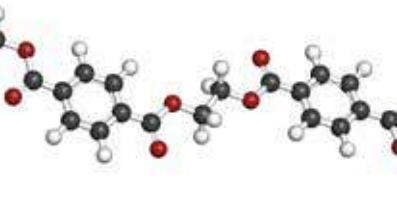
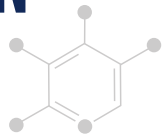




Product
Portfolio



ESSENTIAL TOOLS FOR
MATERIAL
CHARACTERIZATION



BRAND OVERVIEW



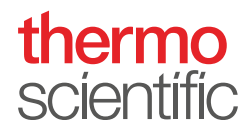
HORIBA
Scientific

The HORIBA Group of worldwide companies provides an extensive array of instruments including the most Advanced Particle Characterization instruments in the World, these include Particle Sizing instruments from less than 1 nm to over 5 mm, Zeta Potential and Particle Shape analyzers, for applications ranging from R&D to Quality control for a diverse range of industries, including Pharma, Cement, Paints, Polymers and Life Science.



NETZSCH

The Analyzing & Testing business unit of the NETZSCH Group develops and manufactures a comprehensive high-precision instrument line for thermal analysis and thermo physical properties measurement, as well as offering world class testing services in our laboratories. Our instrumentation is employed for research and quality control in the polymer sector, the chemical industry, areas of inorganic and building materials and environmental analysis.



thermo
scientific

Authorized Distributor

Thermo Fisher Scientific help scientists meet the challenges they face in the lab or in the field every day. FTIR spectroscopy is a highly diverse molecular spectroscopy technique and chemical analysis method. While FTIR is frequently used for polymer testing and pharmaceutical analysis, the application of the technique is virtually limitless offering both qualitative and quantitative analysis of a wide range of organic and inorganic samples.



Brabender

Brabender GmbH is a leading manufacturer of instrumentation for rheology, processing development, laboratory scale compounding, extrusion, mixing applications and moisture. Their extensive product line is utilized for sample preparation, R&D, evaluation, quality control, new product development and production environments. Their main areas of expertise are in the fields of Food, Polymers and Chemicals.



CAMAG

CAMAG is the world leader in instrumental High Performance Thin-Layer Chromatography (TLC / HPTLC). Camag provides high-end instruments, tools and concepts for TLC/HPTLC, support to its clients with training, technical and contract laboratory services. Wherever complex substance mixtures are analyzed (e.g. herbal, environmental or forensic samples), TLC/HPTLC is often an excellent alternative to GC and HPLC.



LAUDA
scientific

Since 1967 LAUDA has been developing, manufacturing and selling reliable precision measuring instruments that have become firmly established worldwide in research, teaching and quality assurance. LAUDA Scientific is your partner for measuring instruments for determining the viscosity of polymer solutions, optical contact angle measuring instruments for measuring the free surface energy and the wetting behavior, and classical tensiometers for determining the surface and interfacial tension of oils and surfactants.



nea spec
see the nanoworld

Neaspec designs, manufactures and distributes advanced nanoscale optical imaging & spectroscopy microscopes. The company was founded to revolutionize nanoscale analytics, with the ultimate goal to enable technological & scientific progress in every lab around the world.



Tinius Olsen

Tinius Olsen systems are designed for use in Research, Quality Control and Education sectors proving the strength and performance of materials, components and devices. All are designed to support productivity, repeatability and traceability in manufacturing environments. Through its proactive input in developing international test standards, Tinius Olsen testing systems complies with relevant ASTM, ISO, EN, JIS, GB and GOST standards, meeting client's strategic needs.



PSA

PSA has gained an international reputation as leaders in the determination of Mercury and Arsenic and other environmentally important elements. Matrices include water, soils, sludge's, effluents and gases with customers and installations worldwide.



Xoptix

Xoptix Limited was founded in 2005 by a Team of Scientists and Engineers who are passionate about laser diffraction and particle sizing. With a range of in-line particle sizers to help control processes in both wet and dry applications, the XO range of particle sizers have shown real business benefit at each installation, as the inline monitoring of a process helps to regulate efficiency.

WE SERVE CUSTOMERS IN THE FOLLOWING SECTORS



Natural Products



Pharmaceutical Manufacturers



University & College



Electronic/
Electric



Food &
Agriculture



Commercial Testing
Laboratories

...AND
MUCH
MORE!



Semiconductors



Automotive



Polymer



Palm Oil



Oil & Gas



Research &
Institutions



Rubber/
Latex



Specialty Chemicals/
Dispersion



COMPANY OVERVIEW

Nexus Analytics is an Analytical Instrument company which has over 30 years of Material Characterization experience in Malaysia and Singapore.

In 2017, Nexus Analytics in both Malaysia & Singapore became members of the Melchers Group (C. Melchers GmbH & Co. KG). It is a privately owned company based in Bremen, Germany, established in 1806. The Group has offices in most Asian countries with a focus on Greater China and South Korea as well as South East Asia.

As a leader in the distribution and support of scientific research products in South East Asia, Nexus Analytics represents renowned manufacturers from around the world in providing current and next-generation technologies.

We have consultative approach to understanding the customer needs and to develop solutions for specific issues, be it an R&D challenge or a Q/C requirement.

INDEX

CONTENT	PAGE NO.
Molecular Spectroscopy	7
— Summit FTIR Spectrometer — SurveyIR™ — Nicolet iS20 — Nicolet iS50	7
Raman Spectroscopy	8
— DXR™3 Smart Raman Spectrometer	8
— DXR™3 Raman Microscope	
— DXR™3xi Raman Imaging Microscope	
Infrared Microscopy	9
— Nicolet™ Continuum™ Infrared Microscope	9
— Nicolet™ iN10™ Infrared Microscope	
— Nicolet™ iN10™ MX Infrared Imaging Microscope	
— iN5 FTIR Microscope	
Near Infrared	10-11
— iS 5N FT-NIR Spectrometer	10
— Antaris™ II FT-NIR Analyzer	
— Antaris™ MX FT-NIR Process Analyzer	
— Fiber Optic Probe Solutions	11
Nano FTIR	12
— Near Field Detection Module For Spectroscopy (nano-FTIR)	12
Particle Characterization	13-15
— LA-960 Laser Scattering Particle Size Distribution Analyzer	13
— Partica Mini LA-350	14
— Camsizer P4 Dynamic Image Particle Size & Shape Analyzer	
— Camsizer X2 Dynamic Image Particle Size & Shape Analyzer	
— SZ-100 Nanopartica (Dynamic Light Scattering)	15
In Process Particle Sizing	16
— On-line Particle Size	16
Thermal Analysis	17-18
— Differential Scanning Calorimetry (DSC)	17
— Thermogravimetric Analysis (TGA)	
— Simultaneous Thermal Analysis (STA) TGA-DTA/TGA-DSC/TGA	
— Thermomechanical Analysis (TMA)	
— Dynamic Mechanical Analysis (DMA)	18
— High Force Dynamic Mechanical Analysis (DMA)	
— Dilatometry (DIL)	
Thermal Diffusivity & Thermal Conductivity	19-21
— Cure Monitoring by Dielectric Analysis (DEA)	19
— Calorimetry (ARC/APTAC/MMC)	
— Laser / Light Flash Analysis (LFA)	
— Simultaneous Determination of Seebeck Coefficient and Electrical Conductivity	20
— Determination of Thermal Conductivity With Heat Flow Meter (HFM)	
— Determination of Thermal Conductivity With Guarded Hot Plate (GHP)	
— Thermal Conductivity Measuring Device With Heat Flow Meter - TCA 300	21
— Thermal Conductivity Measuring Device With Guarded Hot Plate - TLP 500	


INDEX

CONTENT	PAGE NO.
Fire Testing System	22
— Oxygen Index Analyzer (LOI)	22
— Fire Testing System for Cables (KBT)	
Rheology	23-24
— Rotational Rheometers	23
— Capillary Rheometers	24
— Dynamic Shear Rheometers	
Material / Physical Testing	25-27
— Melt Flow Indexers	25
— HDTM Series	
— Universal Testing Machines	26
— Impact Testers	27
— Hardness Testers	
— Horizon Software	
Food Extruder & Quality Testing Equipment	28-29
— Farinograph-TS — Extensograph-E — Amylograph-E	28
— Glutopack — Viscograph-E — Rotary Mill	29
Laboratory Extruder & Mixers	30-32
— Lab Compounder KETSE 20/40 — Moisture Tester MT-CA	30
— AQUATRAC — Twin Lab-F 20/40	
— Plastograph EC and EC plus & Measuring Mixer 30/50 — Plasti-Corder Lab Station	31
— Stand-alone Single Screw Extruder KE 19 & KE 30	
— Univex Flat Film Take Off Unit	32
— Film Quality Analyzer (Optical in-line analysis)	
— Absorptometer “C”	
Viscometry & Tensiometry	33-34
— Glass Capillary Viscometer	33
— Visco-Fix System, iVisc	
— Processor Viscosity System (PVS)	
— Manual Tensiometer	34
— Compact Ring / Plate Tensiometer, TD4	
— Drop Volume Tensiometer, TVT2	
— Bubble Pressure Tensiometer, MPTC	
Surface Analyzer System	35-36
— LSA 60, LSA 100, LSA 200	35
— OT100 Optical Drop Tensiometer	36
— Automatic Contact Angle Measurement On Large Surfaces	
High Performance Thin Layer Chromatography (HPTLC)	37-38
— Automatic TLC Sampler (ATS 4)	37
— Automatic Developing Chamber 2 (ADC 2)	
— TLC Visualizer 2, TLC Scanner 4, Derivatizer	
— TLC-MS Interface 2	38
— VisionCATS Software	
— TLC HPTLC Basic Kits	
— HPTLC PRO System	


INDEX

CONTENT	PAGE NO.
Mercury, Arsenic & Selenium Analysis	39
— Millennium Merlin Mercury Analyzer	39
— Sir Galahad Mercury Analyzer in Gaseous Sample	
— Millennium Excalibur System	
— Online Mercury Analyzer	
Essential Tools For Polymer Characterization	40-42
Lab Testing Services	43-44
Application & Technical Support	45
Service & Maintenance	46
Appendix - Posters	47

Nicolet FTIR Spectrometer

FTIR spectroscopy is a highly diverse molecular spectroscopy technique and chemical analysis method. While FTIR is frequently used for polymer testing and pharmaceutical analysis, the application of the technique is virtually limitless offering both qualitative and quantitative analysis of a wide range of organic and inorganic samples.

**Summit FTIR Spectrometer**

- ◆ Ideal spectrometer for product assurance testing and material identification for industrial, government and academic labs around the world.
- ◆ Rugged, lightweight and compact with built in PC & touchscreen display
- ◆ Collect accurate spectra with a signal-to-noise ratio of 40,000:1 and best in class spectral resolution (0.45cm⁻¹)
- ◆ Automatically collect backgrounds while the instrument is idle, cutting analysis time by 50%
- ◆ Enhanced connectivity with Wi-Fi & Ethernet along with access to OMNIC™ Anywhere Cloud-based application to allow you share data anywhere, anytime and on any device
- ◆ Comes with standard 10 years warranty on crucial component

**SurveyIR™
(FTIR Microanalysis Accessory)**

- ◆ Portable sample compartment microscope for the Nicolet iS5
- ◆ Spatial resolution 100 microns, accommodate transmission, reflectance & ATR modes.

**Nicolet iS20**

- ◆ Maximize laboratory productivity and quickly collect high quality spectral data.
- ◆ Identify unknown contaminants, perform failure analysis and accurately analyze mixtures using the spectral power.
- ◆ OMNIC Series software, unique Mercury TGA analysis package, and 3D displays allow to quickly extract useful information from TGA-IR and other time-based experiments.

**Nicolet iS50**

- ◆ ATR, Raman, TGA and NIR modules at the touch of button.
- ◆ Integrated modules provide flexibility to analyze multiple sample types.
- ◆ Automation allows unattended multi-range operation.
- ◆ Powerful OMNIC software ideal for method development, analytical support, and research

Raman Spectrometer / Microscopy

Easily adapts to any sample challenge while maintaining reproducibility and speed using the DXR™ family of Raman instruments. With expertise built in, you get results faster than ever before.

**DXR™ 3 Smart Raman Spectrometer**

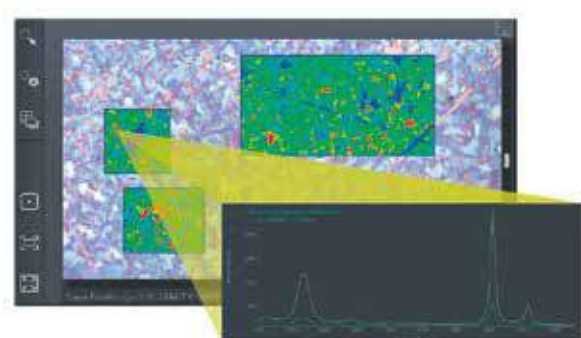
- ◆ Built for dedicated bulk sample analysis and designed for busy multi-purpose analytical labs.
- ◆ Provides reproducible and accurate results in a dependable, low-maintenance platform.

**DXR™ 3 Raman Microscope**

- ◆ Workhorse research-grade microscope offering superior combination of performance and ease of use.
- ◆ Offers high spatial resolution point and shoot Raman for the most demanding analytical tasks.
- ◆ High precision motorized stage control provides intuitive mapping of lines, areas, depth profiles, and cross-sectional slices.

**DXR™ 3xi Raman Imaging Microscope**

- ◆ Rapidly explore the entire sample area and find exactly what you are looking for (eg: target particles, defects, contaminant, etc)
- ◆ Produces stunning chemical images and gives rapid, research quality results for all users from basic to advance.
- ◆ Reveals visual information with speed and simplicity idea for multi-user labs in academia, government and industry.

Visually Driven Imaging

- ◆ Live spectral search and component identification aids multiple region selection.

INFRARED MICROSCOPY

thermo
scientific

Authorized Distributor

Nicolet Infrared Microscopy

Infrared microscopy combines the power of FT-IR spectroscopy and the beauty of optical microscopy sample viewing into one convenient sampling tool. Infrared microscopy is one of the most useful material characterization tools to get the right answer.



Nicolet™ Continuum™ Infrared Microscope

- ◆ It combines high performance infrared sampling and excellent visible light microscopy in one unit.
- ◆ Provides fully automated operation, making it easy and efficient to use while also offering visual observation of microscopic samples and chemical characterization of most organic and inorganic compounds.



Nicolet™ iN10™ Infrared Microscope

- ◆ Able to measure samples down to a few microns, makes it a cost effective infrared microanalysis solution.
- ◆ Room temperature detector eliminates need for liquid nitrogen for samples down to 50-microns.
- ◆ Ideal instrument for analytical services, materials science & academia.
- ◆ Up to three detectors for the versatility to operate in any environment.



Nicolet™ iN10™ MX Infrared Imaging Microscope

- ◆ It provides the power required to rapidly acquire and analyze chemical images to enhance your understanding of the chemical distribution of materials in heterogeneous samples.
- ◆ The integrated and highly efficient optical design of Nicolet iN10 MX Microscope improves the speed and sensitivity of routine single point measurements, as well as chemical imaging data sets quality.
- ◆ Ultra-fast mapping: 10 steps/second at 16cm resolution (1.2 × 1.2mm) in 4.5 minutes.



Nicolet™ iN™ 5 FTIR Microscope

- ◆ Quickly identify unknown materials and contaminants that may affect product quality.
- ◆ Built for the demands of the busy QA / QC lab & provide reliable operation for multiple users and product analysis needs.
- ◆ Permanently-aligned optics, high-powered LED illumination, and binocular and video viewing options provide you with a clear image of your sample.

Advantages of FT-NIR Analysis Over Traditional Techniques

- ◆ No sample preparation: Sampling can be done through glass and other packaging materials
- ◆ Non-destructive measurement
- ◆ Increased sample throughput
- ◆ Remote sampling with low-cost fiber optics
- ◆ Fast: All frequencies are measured simultaneously
- ◆ Fewer standards and less complex methods are required due to superior resolution, precision and accuracy of FT-NIR data; methods are more robust and easier to develop

Why FT Near-Infrared?

FT-NIR spectroscopy offers a practical alternative to time-consuming, solvent-intensive, wet-testing methods and liquid chromatography techniques. Its ability to test materials quickly in their production state allows routine analyses to be carried out at the line, rather than in the lab.

**iS 5N FT-NIR Spectrometer**

- ◆ Small footprint saves valuable bench space
- ◆ Spectroscopic performance delivers consistent results
- ◆ Cost-effective and reliable operation saves money
- ◆ Ideal instrument for determining biodiesel content & hydroxyl value for polyols
- ◆ The iD1H Heated Transmission accessory is a perfect fit, providing temperature control of vials and cuvettes for precise quantitative analysis

**Antaris™ II FT-NIR Analyzer**

- ◆ Provides robust and reliable data collection for at line, online and in-line analysis.
- ◆ Is designed for use at production lines, and on factory floors, loading docks or warehouse.
- ◆ High spectral resolution.
- ◆ Fewer standards and less complex methods are required due to superior resolution, precision and accuracy of FT-NIR data.
- ◆ It contains all the tools to analyze solids, liquids, powders, paste and tablets without reconfiguring the analyzer or changing accessories.



Antaris™ MX FT-NIR Process Analyzer

The Antaris MX FT-NIR process analyzer is the robust solution for on-line monitoring and control of your manufacturing. Designed for production environments, this fiber-optic-based FT-NIR spectrometer allows you to remotely monitor multiple sampling points in your process simultaneously using a single instrument. Redundancy and true temporal data give you the real-time answers you need to respond to process deviations. System reliability, performance, and connectivity to other Antaris analyzers provide a significant return on your investment:

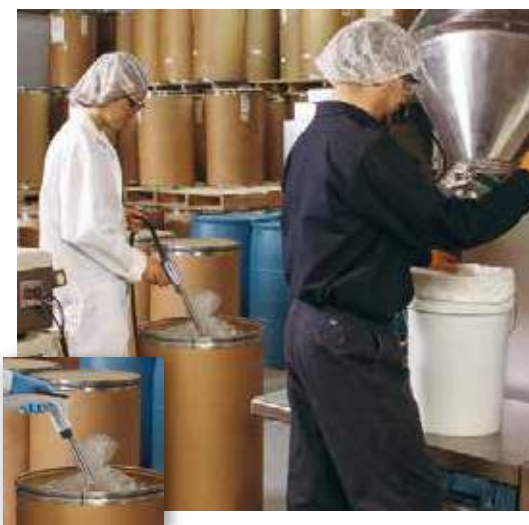
- ◆ Obtain faster feedback on your process
- ◆ Improve product quality
- ◆ Lower operating costs
- ◆ Increase product yields
- ◆ Increase process efficiency

Key Features:

- ◆ Thermo Scientific™ ValPro™ Instrument Qualification Package
- ◆ Always-on internal background
- ◆ SMA905 industry-standard connectors for fiber optics — choose the probe right for your process
- ◆ OPC, 4-20mA and Digital I/O for process communications
- ◆ RESULT software integrates the Antaris MX process analyzer into the production environment by relaying measurement data to real-time trend displays for simple monitoring, or to report data to control systems for closed-loop strategies.
- ◆ RESULT with Thermo Scientific™ TQ Analyst™ chemometric model development software provide powerful calibration diagnostic and transfer tools to solve industrial analytical challenges.

Fiber Optic Probe Solutions

We offer a complete line of industry-tested fiber optic cable and probe configurations to provide the right mix of performance and protection.



Our probes provide rugged, long-term performance using a proprietary sapphire window-to-metal seal capability. The probes are available in 316L Stainless Steel, Hastelloy®, or other materials based on application specific needs and engineering requirements. Probes are available for operation at up to 300 °C and at 3000 or 5000 PSI. We offer a wide variety of probes for:

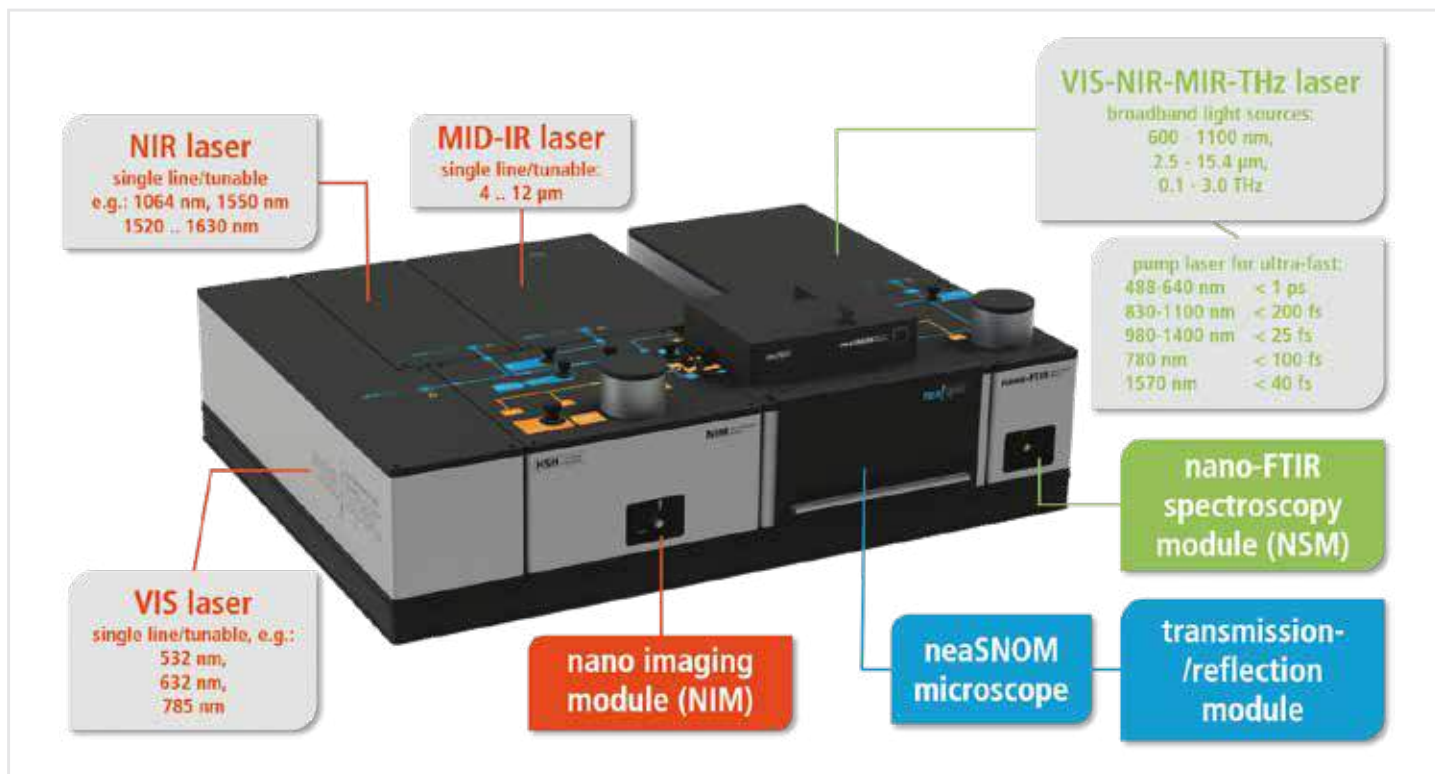
- ◆ Diffuse Reflectance
- ◆ Transflectance
- ◆ Transmission
- ◆ Multi-mode

NANO FTIR



Near Field Detection Module For Spectroscopy (nano-FTIR)

- ◆ Chemical identification @10nm best in class spatial resolution
- ◆ Highest imaging & spectroscopy speed without compromise on quality
- ◆ nano-FTIR directly correlates with conventional FTIR spectra
- ◆ Suited for all material classes, organic & inorganic samples
- ◆ Easy to use with guaranteed performance by intelligent software design
- ◆ Extendable to VIS, NIR, MIR & THz applications by modular system design

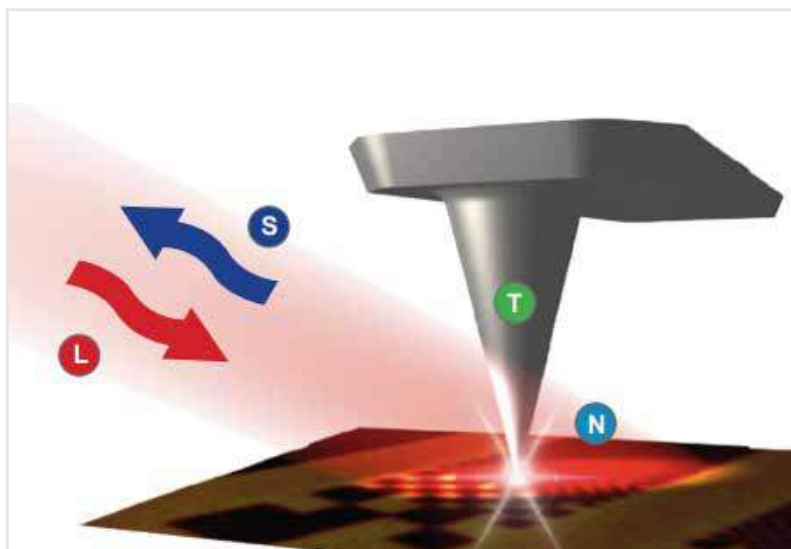


How nano- FTIR Beats the Diffraction Limit in Infrared Imaging & Spectroscopy

- ◆ A focused IR laser beam **L** illuminates a Standard metal-coated AFM probing tip **T**. The tip generates a nano-focus **N** at its apex that is about 1000-time smaller than the diffraction limited laser spot.

The nano-focus **N** is used to locally probe the sample. Infrared imaging & spectroscopy is performed by recording the light scattered **S** by the probing tip while scanning the sample surface.

Neaspec's patented background suppression technique eliminates the diffuse light & thus allows a spatial resolution of 10nm throughout the infrared spectrum.



PARTICLE CHARACTERIZATION



LA-960 Laser Scattering Particle Size Distribution Analyzer

- ◆ Combines the most popular modern sizing technique with state of the art refinements to measure wet and dry samples.
- ◆ Measure particle size between 10 nm ~ 5000 µm.
- ◆ Just 60 seconds operation from dispersant filling to measurement & rinse.
- ◆ With built in centrifugal pump, auto fill pump & ultrasonic probe.
- ◆ Suitable for suspensions, emulsions, powders, pastes, gels and creams.



LA-960 Powder Jet Dry Feeder System

- ◆ Measure particle size between 0.1µm ~ 5000µm.
- ◆ Requires as little as 5 milligrams of powder for a result.
- ◆ “Auto Measurement” one-button operation for any experience level.
- ◆ 2 seconds from start to measurement.
- ◆ Installed on main unit, requires no additional space.



Accessories:

- ◆ **Fraction Cell**
This accessory is ideal when the total sample amount is small, the sample or dispersant is toxic, or you wish to recover the measurement sample.
- ◆ **Imaging Analysis Unit**
- Built into the main unit and allow visualizes the particles in the wet circulation system.
- Measurement range: 9µm - 1000µm



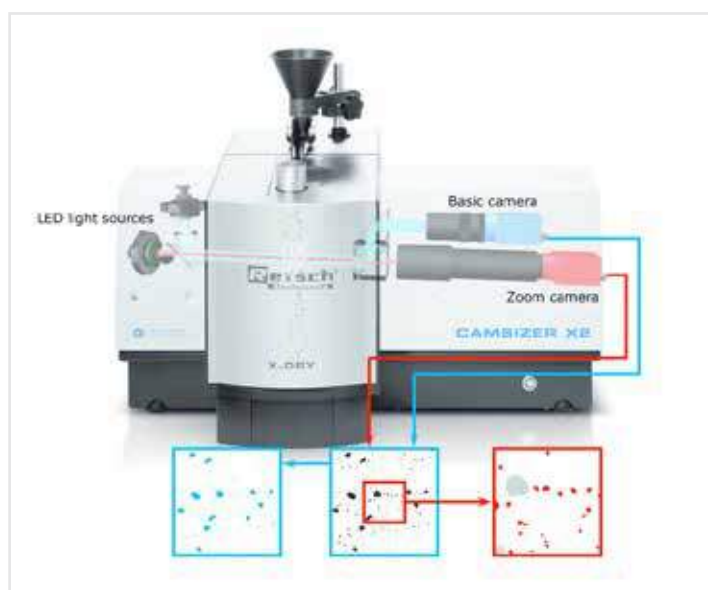
Partica Mini LA-350 (Compact Routine Laser Diffraction Analyzer)

- ◆ This Laser Diffraction Particle Size Analyzer has excelled in applications as diverse as polymer emulsion/suspension, minerals, slurries, latex, & paper chemistry.
- ◆ It is able to handle all kind of samples that disperse in either water or solvent.
- ◆ It features a small footprint (297mm x 420mm) and a wider size range (0.1 - 1000 μ m).



CAMSIZER P4 - Dynamic Image Particle Size & Shape Analyzer

- ◆ Dual camera system provides optimized analysis for small & large particles.
- ◆ Measuring range from 20 μ m to 30mm.
- ◆ Excellent dynamic range for measuring wide particle size distributions.
- ◆ Particle shape analysis (E.g. Detection of agglomerates, broken particles or contaminations.)
- ◆ Flexible data evaluation thanks to the particle library & 3D cloud.



CAMSIZER X2 - Dynamic Image Particle Size & Shape Analyzer

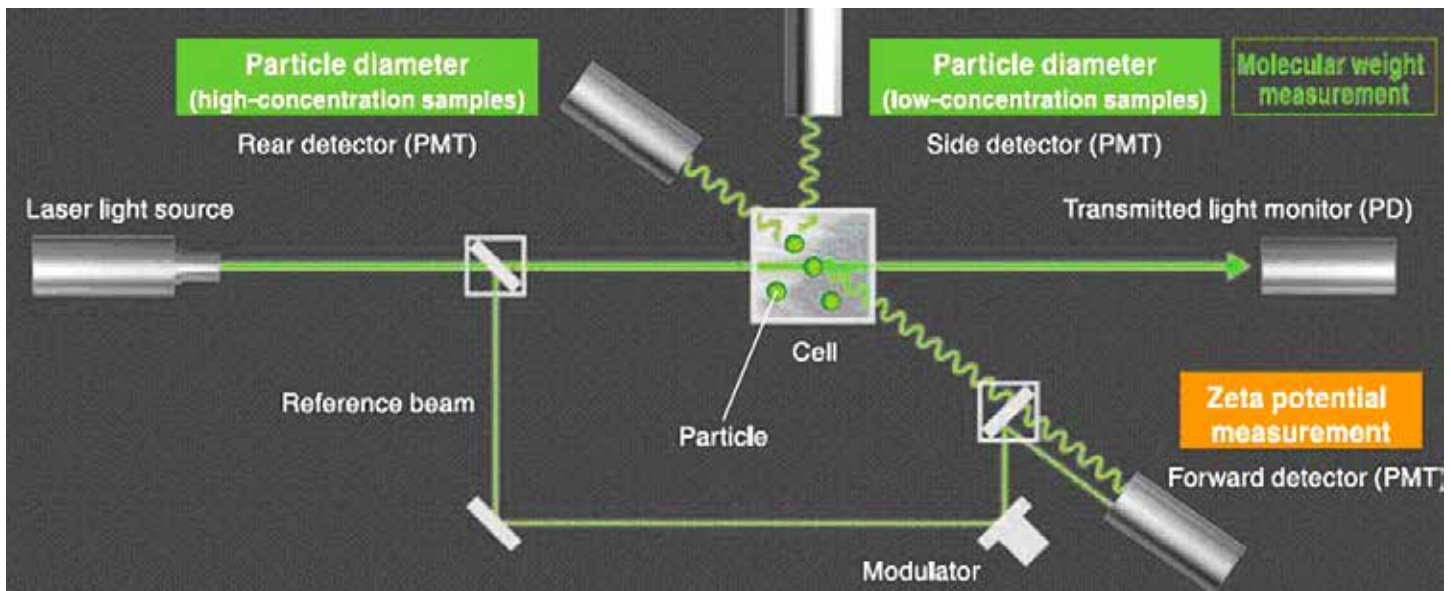
- ◆ Digital image processing with patented two-camera system (acc.to ISO13322-2)
- ◆ Measuring range from 0.8 μ m to 8mm.
- ◆ Flexible X-Change system:
 - **X-Fall** module is free fall mode (Measuring range: 10 μ m - 8mm)
 - **X-Jet** module with adjustable pressure and variable nozzle geometry (Measuring range: 1 μ m - 3mm)
 - **X-Flow** module for wet dispersion (Measuring range: 0.8 μ m - 1mm)

PARTICLE CHARACTERIZATION

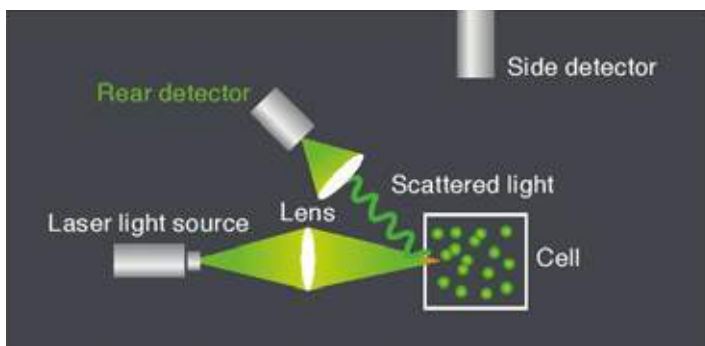


SZ-100 Nanopartica

- ◆ Particle size, zeta potential, molecular weight and second virial coefficient all in one instrument (3 in 1).
- ◆ Measures particle size from 0.3nm to 8µm by Dynamic Light Scattering Theory.
- ◆ Particle size measurements at both 90° and 173° high sensitivity PMT detectors.
- ◆ These unique detector & cell position configurations allow maximum flexibility for sample concentration requirements.
- ◆ The three angle system of the SZ-100 enables analysis of a wide range of high concentration and dilute samples.

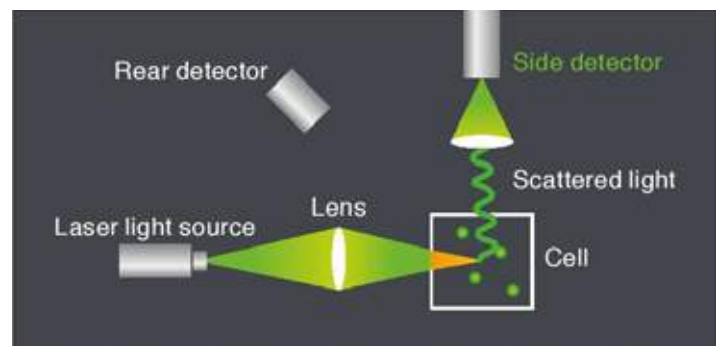


- ◆ The optical configurations shown can be automatically selected depending on the concentration of the analyzed sample.



High Concentration Samples

- ◆ [Redacted]



Dilute Samples

- ◆ In order to minimize the effect of stray light and maximize signal to noise ratio the analyzer detects scattered light at a right angle.

IN PROCESS PARTICLE SIZING



On-line Particle Size (Both Wet and Dry)

- ◆ 24/7 continuous monitoring of your production process
- ◆ Real time results allowing closed loop control
- ◆ Unique patented self monitoring, self diagnosing and self cleaning technology, ensuring maximum uptime
- ◆ Wide range of sampling options, extending the capabilities to new applications.
- ◆ Variable stage dilution system, with low diluent overhead, allows easy return of sample to main process.
- ◆ Fast ROI. Affordable cutting edge technology



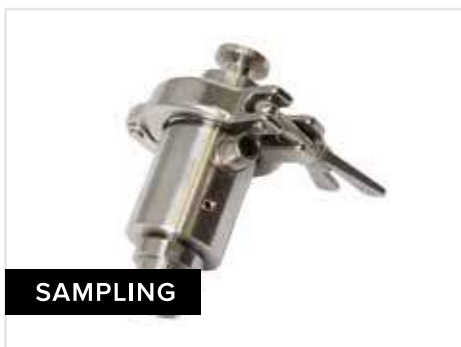
Fundamentally, any material within the 0.1 to 1100 micron size range of our instrument, which can be sampled during its manufacture into its primary particles can be measured.



CEMENT



COAL



SAMPLING



OIL

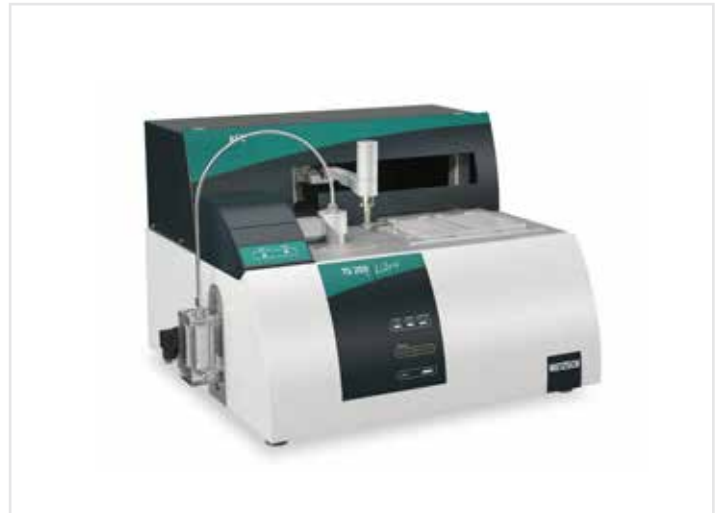


PHARMACEUTICALS



Differential Scanning Calorimetry (DSC)

- ◆ -180°C to 2000°C
- ◆ The various types of NETZSCH DSC instruments all operate in accordance with the heat flow principle. They are characterized by a three-dimensional symmetrical design with homogeneous heating.
- ◆ Sensors with high calorimetric sensitivity, short time constants and a condensation-free sample chamber in the DSC cell ensure high detection sensitivity.



Thermogravimetric Analysis (TGA)

- ◆ 10°C to 1100°C
- ◆ NETZSCH TGA instruments are equipped with digital balances and are vertically designed, featuring a top-loading sample arrangement and direct temperature measurement at the sample.



Simultaneous Thermal Analysis (STA) TGA-DTA/TGA-DSC/TGA

- ◆ -150°C to 2400°C
- ◆ With the STA instrument series NETZSCH is setting high standards. Unlimited configurations and unmatched performance are the foundations for a great variety of application possibilities in fields such as ceramics, metals, plastics and composites over a broad temperature range.



Thermomechanical Analysis (TMA)

- ◆ -150°C to 1550°C
- ◆ The TMA 402 F1 and F3 Hyperion® have been developed for the highly precise measurement of dimensional changes to the specimen as a function of temperature under a defined load.
- ◆ A wide variety of sample holder types and a double furnace hoist make the Hyperion® the most flexible TMA on the market.



Dynamic Mechanical Analysis (DMA)

- ◆ -170°C to 600°C
- ◆ The robust construction of the DMA 242 and the high resolution of its deformation measuring system enable precise measurements on both very rigid and very soft samples.
- ◆ Its unparalleled variety of deformation types, digital signal filtering and frequency extrapolation make the DMA 242 the most versatile system available for measuring viscoelastic properties of polymers and composites.



High Force Dynamic Mechanical Analysis (DMA)

- ◆ -150°C to 1500°C
- ◆ The testing instruments of the EPLEXOR® series enable the mechanical characterization under high loads at temperatures up to 1500°C. Under such conditions properties such as rolling resistance of tires or fatigue testing of composites and adhesive joints can be investigated.
- ◆ The technique can be applied to a wide range of different materials: From elastomers, thermoplastics, composites, metals, glasses, and ceramics to biomaterials and even foods.
- ◆ The instruments can be equipped with a humidity generator and an automatic sample supply system for tension, compression, bending or shear mode.



Dilatometry (DIL)

- ◆ -180°C to 2800°C
- ◆ When it comes to the determination of linear thermal expansion in solids, liquids, powders, pastes or fibers, the DIL 402 Expedis series of pushrod dilatometers leaves no measurement problem unsolved.
- ◆ The interchangeable furnaces cover all applications for high-precision expansion control in many fields, including high-tech ceramic and metallic materials in the areas of material development, basic research and quality control.

THERMAL DIFFUSIVITY & THERMAL CONDUCTIVITY

NETZSCH



Cure Monitoring by Dielectric Analysis (DEA)

- ◆ -150°C to 350°C
- ◆ For the investigation of thermosetting resins, composites, adhesives and paints, Dielectric Analysis has stood the test of time. An important value in describing curing processes is the ion conductivity. In order to address all possible needs, NETZSCH offers both single and multiple-channel DEA systems.



Calorimetry (ARC/APTAC/MMC)

- ◆ RT to 500°C
- ◆ The MMC 274 Nexus® is a diverse instrument platform with multiple calorimeters capable of testing samples using a variety of calorimetric methods including scanning (differential available), adiabatic and isothermal.
- ◆ Endotherms, exotherms, heat capacity, and sample pressures can be measured accurately on gram-sized samples and mixing and stirring are available.
- ◆ Additionally, our well-proven ARC 244/254 and APTAC 264, with the patented VariPhi® technology, are high-end systems investigating data relevant to chemical process safety and battery safety and development.



Laser/Light Flash Analysis (LFA)

- ◆ -125°C to 2800°C
- ◆ Thermal conductivity and diffusivity are the most important thermophysical material parameters for the description of the heat transport properties of a material or component.
- ◆ The Laser/Light Flash technique has proven itself as a fast, versatile and precise absolute method for measuring thermal diffusivity. NETZSCH offers three LFA models, covering the widest temperature range for the broadest spectrum of materials.

THERMAL DIFFUSIVITY & THERMAL CONDUCTIVITY

NETZSCH



Simultaneous Determination of Seebeck Coefficient and Electrical Conductivity

- ◆ RT to 800°C
- ◆ One approach in the field of thermoelectricity is to generate electrical energy from heat which has been released to the environment.
- ◆ For applications such as these, it is necessary to develop thermoelectric materials with high working temperatures and optimized efficiency.
- ◆ The SBA 458 Nemesis® allows for the simultaneous measurement of the Seebeck coefficient and electrical conductivity under identical conditions.



Determination of Thermal Conductivity With Heat Flow Meter (HFM)

- ◆ -20°C to 90°C (optional for Medium: -30°C to 90°C)
- ◆ With the HFM 446 Lambda, the thermal conductivity of insulating materials can be measured. Patented plate temperature control yields unmatched testing speeds and highly accurate results.
- ◆ The Lambda instruments are ideal for QC/QA and conform to all required industrial standards.



Determination of Thermal Conductivity With Guarded Hot Plate (GHP)

- ◆ -160°C to 250°C
- ◆ The GHP 456 Titan® allows for determination of the thermal conductivity of insulation materials with outstanding reliability and accuracy across a broad temperature range.
- ◆ Innovative plate materials and temperature sensors, special design features and an improved data acquisition and control system make this GHP the new benchmark in the field of insulation testing.

THERMAL CONDUCTIVITY



We offer devices according to the following measuring methods:

- ◆ Devices with heat flow meter according to ISO 8301
- ◆ Devices with guarded hot plate according to ISO 8302
- ◆ Devices with guarded hot pipe according to DIN EN ISO 8497

The choice of system is determined by the intended application:

	Heat Flow Meter	Guarded Hot Plate/Pipe
Measuring time	short	long
Calibration	at regular intervals	annual function control
Field of application	quality and production control	research & development, reference measurements
Measuring area	according to customer requirements within the limits defined by the respective standard and the overall physical restriction	



Thermal Conductivity Measuring Device With Heat Flow Meter - TCA 300

- ◆ According to ISO 8301, ASTM C 518, DIN EN 1946-3, EN 12664, EN 12667 and EN 12939.
- ◆ Fully insulated test chamber to avoid thermal influences, air-cooled Peltier-temperature, electrical lifting device and digital pressure and sample thickness-measurement.
- ◆ Measuring range: 0.002 – 1.0 W/m·K
- ◆ Temperature range: (min/max)
Cooling Plate: -20 / +60°C
Heating Plate: -10 / +70 °C



Thermal Conductivity Measuring Device With Guarded Hot Plate - TLP 500

- ◆ According to ISO 8302, ASTM C177, EN 1946-2, EN 12664, EN 12667 and EN 12939.
- ◆ TLP 500 series are robust cabinet devices, which are especially suited for testing thicker samples.
- ◆ Measuring range: 0.005 – 2.0 W/m·K
- ◆ Temperature range: (min/max)
Cooling Plate: -15 / +60°C
Heating Plate: -5 / +70 °C

FIRE TESTING SYSTEM



Fire-testing products have been increasing in importance in recent times.

It is essential that products and materials are as flame-resistant as possible for reasons of safety and regulations. It is also important that a product generates as little smoke as possible in the event that it does ignite; this can help save lives.

The main issues which should be taken into consideration in product development are:

- Preventing products from igniting & burning quickly
- Producing low-flammability products
- Knowing how flammable products behave
- Generating the least amount of smoke possible
- Adhering to local, state or national product standards



Oxygen Index Analyzer (LOI)

- ◆ To determine the burning behavior of plastics by oxygen index at ambient temperature in accordance with ISO 4589-2, DIN 22117 and ASTM D 2863
- ◆ Fully automatic calibration & automated testing procedure
- ◆ Sample holders available for rod-shaped and flat samples
- ◆ All relevant data such as temperature, flow rate and time are displayed during the test. Except for the test gases (O₂ / N₂), all necessary accessories for performing standard tests are included with the device and greatly simplify day to-day work at the lab



Fire Testing System for Cables (KBT)

- ◆ To measure the heat release and smoke production during flame spread tests on vertically mounted bunched cables and insulated wires, in accordance with EN 50399 and IEC 60332-3-10 (testing device)
- ◆ The high-resolution color touch display on the “KBT Control” cabinet allows for measuring and control with the integrated Single Board Computer, Windows operating system and KBT software
- ◆ Double-walled test chamber, stainless steel with mineral wool insulation, opening for air supply at the bottom, opening for smoke extraction, rail guides on the back wall for easy mounting of sample holders, electric winch assembly, stainless steel door with fire-resistant glazing.

RHEOLOGY



The Kinexus rheometer helps you define and understand material characteristics – from viscosity to viscoelasticity – and solve material problems at all stages of the product life cycle.



Rotational Rheometer - Kinexus Lab+

- ◆ Is designed to withstand the rigors of a busy Quality control laboratory to provide reliable rheological test capabilities.
- ◆ Torque range (strain & stress control) : 5.0 nNm – 200 mNm.
- ◆ Key Applications: Food & Drinks, Pharmaceuticals, QC Testing & Paints, Inks and Coatings.



Rotational Rheometer - Kinexus Ultra+

- ◆ Has the highest sensitivity air bearing and widest torque range, coupled with the unprecedented vertical (axial) control capabilities for advanced rheological testing
- ◆ Torque range (strain & stress control) : 0.5 nNm – 250 mNm.
- ◆ Unique sequence-driven rSpace software enables fully customizable test design to set up & investigate tailored rheological test protocols.



Rotational Rheometer - Kinexus Pro+

- ◆ Incorporates technological innovations that enable optimal flexibility in rheological test capabilities and protocols – for research and development requirements.
- ◆ Torque range (strain & stress control) : 1.0 nNm – 225 mNm.
- ◆ Has unprecedented dual-action capabilities for both shear and vertical testing.



- ◆ Environmental cartridges are easily changed or removed for service

From Formulation And Processing To End-Use



Product Appearance, Particle Suspending Capability, Stability

Product Performance



In-Use Processes Product Dispensing, Pouring, Sprayability



Product Application, Spreadability



Capillary Rheometer - Rosand RH2000

- ◆ Configured for research measurements through to Quality Control applications.
- ◆ Provides highly flexible measurement capabilities for wide variety of applications - from polymer melts to pharmaceutical processing and from food stuffs to inks and coatings.
- ◆ Maximum drive force (up to 20kN) and maximum speed (up to 1200mm/min) capabilities enable a wide range of shear rates, and correlation with many real material processing conditions.



Advanced Capillary Rheometers - RH7 & RH10

- ◆ Used in hundreds of research laboratories around the world, the robust 'H' frame design of Rosand RH7 and RH10 floor standing capillary rheometers allows operation under ultra-high loading conditions.
- ◆ Provides highly flexible measurement capabilities for materials under high pressure and high shear rate extrusion – from polymer melts to ceramics, and from food stuffs to inks and coatings.
- ◆ High force range (up to 100kN) and wide dynamic speed range (>225,000:1) allow test correlation with real material processing conditions.



Dynamic Shear Rheometers - Kinexus DSR

- ◆ Is designed for routine analysis and QC testing in the Asphalt industry with true 'plug and play' functionality for all measuring systems and environmental control unit.
- ◆ It applies controlled shear deformation to a sample under test, to enable measurement of flow properties (such as shear viscosity from flow tests) and dynamic material properties (such as viscoelastic modulus and phase angle from oscillation tests).



Melt Flow Indexers

The MP1200 features the latest in melt flow measurement technology and allows operators to quickly and easily set up and perform melt flow tests: according to ASTM D1238, ISO 1133-1 & 2, and other international and industrial specifications.

Key Features

- ◆ Three-zone band heater
- ◆ Touch-screen control
- ◆ Motorized weight lifting device with Programmable Piston Displacement Transducer
- ◆ Powerful data analysis and control software
- ◆ Quick die release
- ◆ USB connectivity
- ◆ Tapered weight design
- ◆ Optional Selectable weight system
- ◆ Auto cutter option
- ◆ Pneumatic cleaning option



HDTM Series

Tinius Olsen offers digitally controlled Automatic Deflection Temperature/Vicat test equipment with an automated testing sequence that proceeds according to user defined control and configuration parameters.

Each test frame can be configured with optional accessories for either Vicat or deflection temperature testing, including both 100mm edgewise and 64mm flatwise deflection temperature, as well as the 4in span test.

Additionally, the 603 HDTM is ready to be linked to Tinius Olsen's HDV software so that the PC can configure the controller, collect the test data, generate a test report and save the results.

Key Features

- ◆ Fully automatic control of entire test cycle
- ◆ Air bearing-guided loading rods for virtually friction-free load application
- ◆ Pneumatic station lift for easy specimen insertion and removal
- ◆ Automatic correction for thermal expansion of test frames
- ◆ Built-in specimen basket to catch any dislodged specimens
- ◆ Conforms to ISO 75, ISO 306, ASTM D648, and ASTM D1525
- ◆ Bath has port with an exhaust fan to remove interior oil fumes
- ◆ Electronic transducers integrated into the loading rod assemblies for 0.001mm (0.0001in) resolution of deflection or penetration
- ◆ Loading nose and rod assemblies provide 76 grams nominal load for ISO 75 'flatwise' deflection temperature tests on 4 x 10mm specimens at 0.45Mpa stress
- ◆ Built-in heat exchanger on 603 for rapid system cooldown

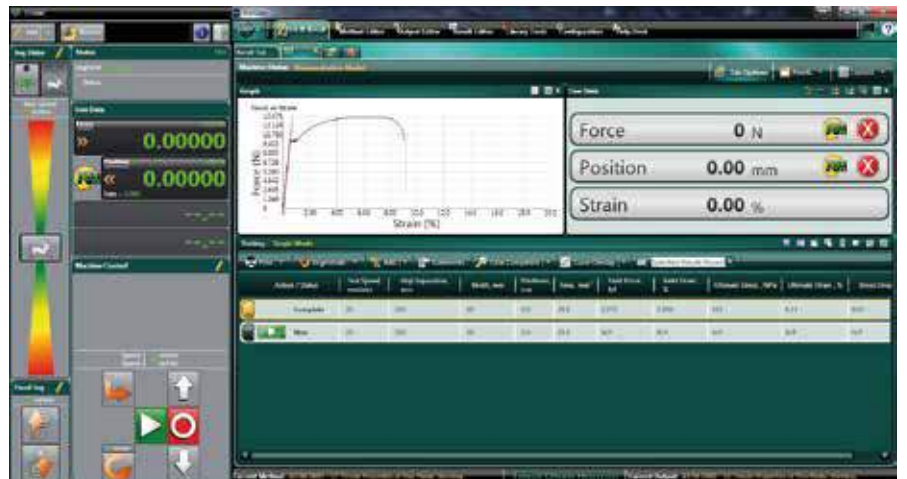
Universal Testing Machines

The ST Series of electromechanical testing machines from Tinius Olsen are designed to test a wide range of materials including, but not limited to: plastics, films, paper, packaging materials, filter material, adhesives, foils, food, toys, medical devices and components, in tension, compression, flexure, shear and peel.



Key Features

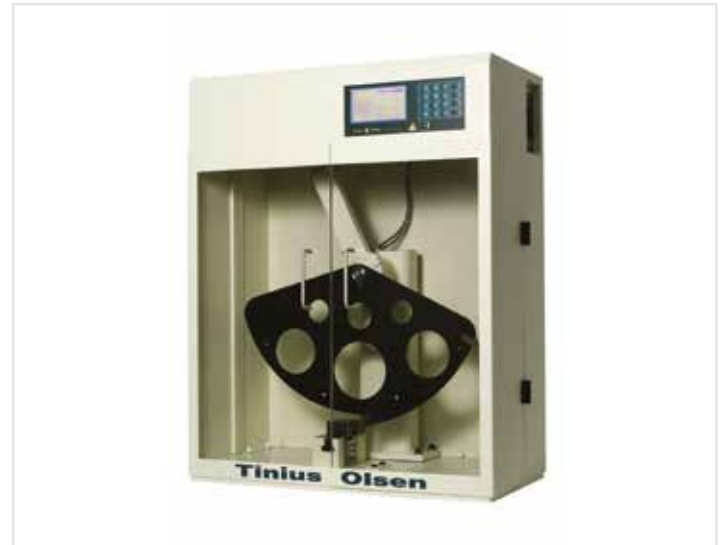
- ◆ Accuracy of better than 0.2% of the reading from 0.2-100% of the load cell capacity
- ◆ Built-in Pneumatic Supply
- ◆ Controller Interfaces; Virtual, Tethered and Bluetooth connected Interfaces
- ◆ Accessory and Device Connectivity
- ◆ T Slots to keep the testing area as open, uncluttered and flexible as possible





Impact Testers

These machines are capable of determining the impact resistance using either a Charpy or Izod configuration, without changing the entire pendulum. Test are in accordance with ASTM D256 (Izod impact), ISO 179 (Charpy impact), ISO 180 (Izod impact), ASTM D6110 (Charpy impact), ASTM D4812 (Unnotched Cantilever Beam impact), ASTM D4508 (Chip impact), ASTM D950 (Adhesive Bond impact) and other similar standards.



Key Features

- ◆ Aerodynamic compound pendulum
- ◆ Selectable energy units of J, in.lbf, ft.lbf, kgf.m and kgf.cm.
- ◆ Break type input options of complete, hinge, partial, non-break and necking.
- ◆ Automatic or manual toss correction
- ◆ Auto-calibration for bearing windage and friction



Hardness Testers

Rockwell, Vickers, Micro Vickers, Brinell or Universal, semi-automated through to fully automated, testing raw material, components and or devices, Tinius Olsen has a hardness tester to meet your needs.

Tester configuration options include manual or motorized X/Y tables, Z-axis, multiple indenter positions, multiple objectives with anti-collision system and overview cameras in support of test piece positioning.



Horizon Software

- ◆ Searchable database of international test standards.
- ◆ Standards from ASTM, ISO, EN, BS DIN and many more.
- ◆ Tests for tension, flexure, melt index, compression etc
- ◆ Ability to customize the test setup using a standard as a template.
- ◆ Setups are available in multiple languages and dialects — even create your own!
- ◆ Multiple levels and types of security to protect data and equipment

Testing instruments for the food lab, including solutions for sample preparation, quality control and process simulation.



Farinograph® - TS

- ◆ Measures flour water absorption and dough kneading characteristics

Why is this important?

- ◆ Estimate the optimum water amount for a flour to form a dough
- ◆ Predict flour reaction in production and baking
- ◆ Define flour specifications for a given purpose

What are the benefits?

- ◆ Practice-oriented, international standard procedure
- ◆ Optimization of flour quality and constant product quality
- ◆ Location-independent tracking of test results on any desktop or mobile device, multiple access to measurement readings



Extensograph® - E

- ◆ Determines dough extensibility and resistance to extension

Why is this important?

- ◆ Flour can be checked for application-specific characteristics
- ◆ Predict dough properties and bakery product volumes
- ◆ Determine gluten strength and bread-making properties of flour
- ◆ Influence of flour additives can be made evident

What are the benefits?

- ◆ Practice-oriented, international standard procedure
- ◆ No production losses due to usage of inappropriate material



Amylograph® - E

- ◆ Measures starch properties and enzyme activity of flour

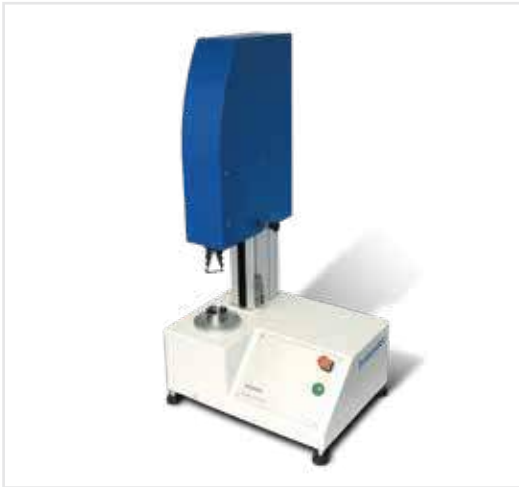
Why is this important?

- ◆ The baking properties of flour depend on the starch gelatinization and on the enzyme activity (α -amylase) in the flour.
- ◆ Flour can be checked for application-specific characteristics

What are the benefits?

- ◆ Practice-oriented, international standard procedure
- ◆ High flour and end product quality
- ◆ No production losses due to usage of inappropriate material

These three instruments in combination form the Brabender 3-Phase-System, which simulates the complete baking process.



GlutoPeak®

- ◆ Measures the aggregation behaviour of gluten, for the purposes of describing its baking properties.

Why is this important?

- ◆ Gluten properties influence dough elasticity and extensibility
- ◆ Stretching and elastic properties of gluten give information about flour quality and the suitability for a given purpose
- ◆ Recognition of drying and heat damage on flour and dry gluten

What are the benefits?

- ◆ Fast test procedure (1-10min) with small sample size (~3-10g)
- ◆ Detection of inappropriate material makes further tests redundant
- ◆ Assurance of good flour and end product quality



Viscograph-E®

- ◆ This instrument measures the viscosity of starch and starch-containing products.

Why is this important?

- ◆ Get information about starch gelatinization and retrogradation, temperature resistance of gelatinizing / gelling products / final products
- ◆ Check different starch and flour characteristics for further processing in different industries and for specific applications

What are the benefits?

- ◆ Practice-oriented, international standard procedure for starch testing
- ◆ Maintain and monitor a constant quality – reduce waste
- ◆ Customise the protocol to specific requirements / variable test-conditions matching your technical requirements
- ◆ Easy/automatic chart interpretation /evaluation



Rotary Mill

- ◆ This lab mill grinds various tough, rigid or fibrous materials with variable degrees of fineness.

Why is this important?

- ◆ The ground material can be used for further analyses, such as moisture testing with the Brabender Moisture Tester MT-CA.

What are the benefits?

- ◆ Interchangeable sieves for different degrees of fineness available
- ◆ Maximum safety
- ◆ Easy-to-change sieves and blades
- ◆ Easy cleaning

LABORATORY EXTRUDER & MIXERS



Instruments and equipment for testing the quality of raw materials used in the food, polymer and chemical industries. Solutions for sample preparation, moisture testing and extrusion on a lab scale.



Lab-Compounder KETSE 20/40

This twin screw lab extruder is used for:

- ◆ Testing the extrusion properties of different materials applied in the food and polymer industries
- ◆ Research and optimization of processing characteristics
- ◆ Product development and recipe optimization
- ◆ Simulation of processes like cold forming, mixing, shaping, gelatinisation, plastification, cooking and expansion

Why is this important?

- ◆ The extruder allows flexible and efficient trials on a lab scale without impacting the current production.

What are the benefits?

- ◆ Cut down on R&D costs – Increase time efficiency in R&D



TWIN LAB-F 20/40

- ◆ Food compliance conformity declaration for all parts which are in contact with food product.
- ◆ Stainless steel built.
- ◆ Openable liner to improve accessibility during cleaning



AQUATRAC®V (Moisture Meter For Plastic)

- ◆ This instrument is the result of continual further development of the popular AQUATRAC product, which has been on the market for over 20 years now.
- ◆ Developed primarily for the plastics-processing industry, the device measures the moisture content of granular solids.

There are many different ways to use AQUATRAC® - 3E directly at the production site, for example:

- ◆ To check incoming granulates
- ◆ To monitor and optimise the drying of granulates
- ◆ To measure granulates right at the machine
- ◆ To take measurements from a finished component, e.g. after conditioning
- ◆ To take laboratory measurements



Moisture Tester MT- CA (Simultaneous Analysis up to 10 samples)

- ◆ This instrument measures the moisture content of various materials applied in the food and polymer industries, such as flour, grain, starch, bread, noodles/pasta, cocoa, chocolate, tobacco, coffee, spices, herbs, polymers and other chemical materials etc.

Instruments and equipment for testing the quality of polymers and other chemical materials on a lab scale, including stand-alone and modular solutions for compounding, extrusion and specific measuring tasks.



Plastograph® EC and EC plus & Measuring Mixer 30/50

- ◆ This instrument as a table-top torque rheometer provides the motion for the processing modules (application-specific measuring mixer, single or twin screw extruder heads), and contains the direct torque measurement system. It controls / reads the parameters of the processing modules, feeders and follow-up units, like temperatures, speed, pressure etc.

Why is this important?

- ◆ The measured values relate to the material behavior and allow conclusions about the rheological properties
- ◆ Easy repeatability of device setting for e.g. recipe development
- ◆ Possibility for process upscale

What are the benefits?

- ◆ Measure raw material quality in advance and quickly react to quality variations before the raw material is used in production



Stand-alone single screw Extruders KE 19 and KE 30

- ◆ These instruments as stand-alone single-screw extruders measure torque, speed and temperature.

Why is this important?

- ◆ This extruder facilitates testing the processing behaviour for new recipes or incoming materials, final material inspection and quality control during production

What are the benefits?

- ◆ Easy production simulation in real time with small material amounts
- ◆ Find the optimum processing conditions on your production scale
- ◆ Fixed built-in drive motor, no separate drive unit necessary
- ◆ Compact design, saves space in your lab



Plasti-Corder® Lab - Station

- ◆ This instrument is a floor-standing torque rheometer. Compared with the table-top Plastograph EC plus, it has the same function but offers additional benefits, such as:
- ◆ Suitability for applications with higher torque (up to 400 Nm) and speed (up to 350 min⁻¹) due to higher drive power (16 compared to 3,8 kW)
- ◆ Compatibility with all Brabender measuring mixers, single and twin screw extruder heads

Downstream equipment for Brabender single and twin screw extruders, applied for e.g. conveying, cooling, pelletizing, taking off or winding polymer strands, films and other extruders.



Univex Flat Film Take-Off Unit

- ◆ The Brabender Univex is a universal haul-off unit for taking off, cooling, and winding up flat films up to a max. film speed of 30 m/min.

Why is this important?

- ◆ Flat films can be cooled evenly
- ◆ Crystallization processes in the film positively influenced (by liquid temperature conditioning)

What are the benefits?

- ◆ Excellent film quality
- ◆ Easy take-off and storage for further analyses



Instruments for in-line and on-line film analysis

Film Quality Analyzer (Optical in-line analysis)

- ◆ This instrument optically inspects the quality of blown or flat films on a laboratory or production scale.

Why is this important?

- ◆ Inhomogeneities and impurities (e.g. black specks, gels, fisheyes, holes etc.) can be detected

What are the benefits?

- ◆ Assurance of excellent film quality
- ◆ Compatibility with Brabender Auto-Grader and different film take-off units such as Univex



Instruments for specific measuring tasks

Absorptometer "C"

- ◆ This instrument is used for determining the oil absorption number (OAN) of powdery materials.

Why is this important?

- ◆ The OAN is used for characterizing the structure of carbon blacks, silica and other free flowing materials which have a strong effect on the processing and vulcanization parameters and the quality of the product.

What are the benefits?

- ◆ Automatic burette with ready to use default settings
- ◆ Easy to change mixing bowls
- ◆ Low maintenance and easy cleaning



Glass Capillary Viscometer

- ◆ Viscosity measurement with Ubbelohde, Cannon Fenske, and Micro-Ostwald capillary viscometers
- ◆ Ring marks without detection disturbance
- ◆ Corrosion-resistance labelling
- ◆ Ubbelohde for dilution series with calibration certificate



Visco - Fix System

- ◆ Available for Ubbelohde, Automatic-Cleaning Ubbelohde, Mirco-Ubbelohde and automatic dilution Ubbelohde
- ◆ Higher precision due to longer use of same capillary viscometer
- ◆ Easy cleaning with individual beakers
- ◆ Clean and safe draining and drying
- ◆ Safe - no more glass breakage in the thermostat or during manual handling



iVisc - Easy to operate and compact professional viscometry

- ◆ For quality control of polymers, recycled materials, and finished products
- ◆ Bench-save sensitive solution by combining iVisc and Viscocool 6
- ◆ Peltier-based, highly precise temperature control from 15 to 90 °C
- ◆ Exceptional temperature stability < 0.01°C without external cooling
- ◆ Ideal platform for flexible polymer characterization
- ◆ Comprehensive calculation algorithms already integrated
- ◆ Recommended sample throughput 2 to 4 samples per day



Modular Solution: Processor Viscosity System (PVS)

- ◆ It permits efficient system solutions which are perfectly adapted to the needs of users. This way, you can design the configurations very flexibly for a higher number of samples and new tasks by integrating special components and software modules.
- ◆ The extensive automation; for example, with the cleaning of the glass capillary viscometers, the sample preparation and sample loading, maximizes efficiency while keeping manual efforts to a minimum.
- ◆ Is made up of stand-alone, independent functional units. Measuring stands, cleaning modules, automatic samplers and dosing systems are controlled centrally from an easy to operate Windows measuring program.



Manual Tensiometer, TC1

- ◆ For an easy start in tensiometry
- ◆ Precise and reproducible for research and quality testing
- ◆ User-friendly with predefined standard methods
- ◆ Easy handling due to innovative measuring assistant
- ◆ Optional temperature control, no additional space required



Compact Ring/Plate Tensiometer, TD4

- ◆ For automatic measurement with high reproducibility
- ◆ Flexible for research and quality control
- ◆ User-friendly with predefined standard methods
- ◆ Precise, high-resolution distance measurement for exact measurements according to the Wilhelmy plate method
- ◆ Optional temperature control, no additional space required



Drop Volume Tensiometer, TVT2

- ◆ For precise measurements, drop-by-drop
- ◆ Measurement range 0.1 to 100 mN/m
- ◆ Automatic adaptation of the light sensors sensitivity to the liquid in use
- ◆ Easy connection to LAUDA Thermostats
- ◆ Dynamic interfacial tension for measurement of surfactants, oils, and highly viscous liquids
- ◆ Characterization of inkjet inks
- ◆ Determination of absorption kinetics of surfactants
- ◆ Determination of surfactant content for concentrations above the critical micelle concentration
- ◆ Measurement of aging effects on insulating oils



Bubble Pressure Tensiometer, MPTC

- ◆ For exact surface tension measurements of fast surfactants and their dynamics in the millisecond range
- ◆ Large dynamic range of 1 ms to several seconds
- ◆ Automatic recognition of the transition point bubble/jet range
- ◆ Storage of up to 50 test results and the respective parameters
- ◆ Quality control of fast surfactants
- ◆ Determination of surfactant content for concentrations above the critical micelle concentration

SURFACE ANALYZER SYSTEM



LSA 60

- ◆ For quality control and routine measurements of small to medium sized surfaces and for surfactant solutions
- ◆ Compact size which requires only small bench space
- ◆ Very easy handling with exchangeable manual dosing system
- ◆ Two axis sample platform for exact positioning
- ◆ Powerful algorithms enable precise drop analysis
- ◆ Expandable with automated dosing systems and tilting table modules



LSA 100

- ◆ Ideal for both research & development and quality inspection
- ◆ Accurate pendant drop method with full support for determination of the critical micelle concentration (CMC)
- ◆ Depending on model up to two different dosing systems integrated and optional Surface Free Energy (SFE) software
- ◆ Optional non-contact dosing systems and numerous other modules and accessories, example: Tilting Stage (ATS 360), Retention Force Balance (RFB20), Liquid Bridge Meniscus (LMB), Drop on Filament(DOF), POW 10, MOB and etc.



LSA 200

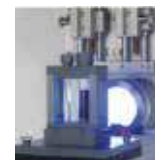
- ◆ Optional with up to three dosing units and therefore ideal for surface energy determination
- ◆ Wide range of drop calculation methods for the contact angle, supplemented by the Unique TrueDrop method
- ◆ Powerful surface tension measurement makes mechanical tensiometers obsolete



◆ Tilting Stage



◆ Thin Sample Holder (STS 20)



◆ POW 10



◆ Retention Force Balance (RFB20)



OT100 Optical Drop Tensiometry – For Fully Automatic Measurements

- ◆ Automatic CMC (Critical Micelle Concentration) measurement with automatic dosing system
- ◆ Accurate and fast measurements due to sophisticated algorithms
- ◆ Combination of pendant drop analysis and the drop volume method for most precise results even with dynamic measurements
- ◆ Optional temperature chambers for controlled environment
- ◆ Expandable to contact angle measuring instrument



Automatic Contact Angle Measurement On Large Surfaces

- ◆ For quality control, research and full automatic analysis attendant to production
- ◆ Precise measurements from 0°C to 180°C by Top-View-Young-Laplace evaluation
- ◆ Customizable to any sample size and shape
- ◆ For surface mapping highest drop density without interactions by previous measurements
- ◆ Fully automatic measurement with up to two liquids for Surface Energy Mapping

THIN LAYER CHROMATOGRAPHY

HPTLC-System for quantitative analyses including TLC Scanner, Image documentation and VisionCATS software for control of instruments. Suitable for laboratories with high sample throughput.



Automatic TLC Sampler ATS 4

- ◆ Fully automated sample applicator for **band-wise application** to achieve better separation of the sample which is suitable for routine use & high sample throughput in mass analysis.



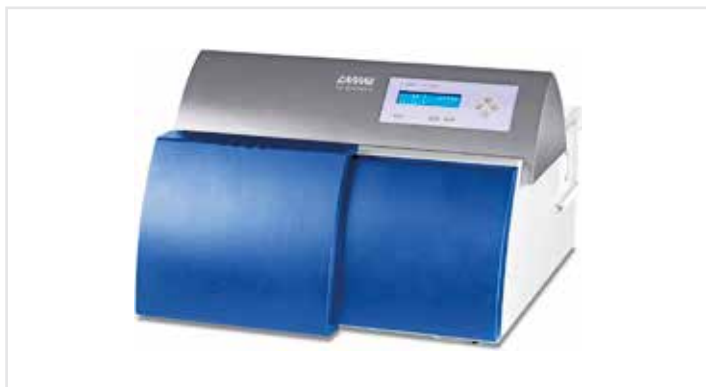
Automatic Developing Chamber 2 (ADC 2)

- ◆ Fully automatic development of 20 x 10 cm TLC/HPTLC plates.
- ◆ Option "**Humidity Control**" allows reproducible chromatography at defined layer activity.



TLC Visualizer 2

- ◆ To capture images of superior quality that provides illumination with direct and/or transmitted white light as well as with direct UV 254nm and UV 366nm light.
- ◆ Image-based profile generation from reference and sample tracks, and subsequent peak integration and calibration.



TLC Scanner 4

- ◆ Is the most advanced workstation for **densitometric evaluation** of TLC/HPTLC chromatograms.
- ◆ The spectral range of light from 190 to 900 nm is available for selecting single or multi wavelengths for scanning densitometry.
- ◆ For measurement of the spectrum of each individual substance on the plate including the evaluation of the substance purity by comparison with reference standard.



Derivatizer

- ◆ Sets a new standard of reproducibility and convenience in reagent transfer onto TLC/HPTLC plates by employing a **unique "micro droplet" spraying technology** (patent pending).
- ◆ Environmentally friendly and safe handling through a closed system.

TLC-MS Interface 2

- ◆ Highly convenient and versatile instrument allowing for rapid and contamination-free elution of TLC/HPTLC zones with online transfer to a mass spectrometer.
- ◆ Compatible with any LC-MS system

**VisionCATS Software**

- ◆ Is a HPTLC Software organizes the HPTLC analysis workflow, controls the involved CAMAG instruments, and manages data.

Key Features:

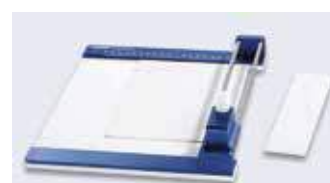
- ◆ Image Comparison Viewer & Enhancement Tools
- ◆ Scanning Densitometry and Spectral Evaluation
- ◆ Quantitative Analysis
- ◆ Free of Charge HPTLC Method Library
- ◆ Compliances with cGMP/cGLP & 21CFR Part11
- ◆ Enable scalability from a single workstation to a multi-user lab network.

**TLC/HPTLC Basic Kits****Accessories**

TLC Plate Heater



TLC Spray Cabinet 2



smartCut Plate Cutter

HPTLC PRO System**Fully Automated Sample Analysis and Evaluation System for Routine Quality Control**

- ◆ Each module can be operated either as stand-alone or within the HPTLC PRO SYSTEM.
- ◆ It employs HPTLC glass plates (20 × 10 cm) and is best suited for routine quality control of analytes extracted from complex matrices.
- ◆ It supports up to 75 samples, up to five plates, and up to three independent developing solvents without intervention.
- ◆ It consists of Modules for each step of the HPTLC process:
SAMPLE APPLICATION, DEVELOPMENT, DERIVATIZATION, DETECTION, and MS-INTERFACE.

MERCURY, ARSENIC & SELENIUM ANALYSIS



Millennium Merlin Mercury Analyzer

- ◆ A versatile analyzer to measure mercury in all types of material.
- ◆ The analyzer combines the advantages of vapour generation techniques which removes most chemical interferences with the sensitivity and selectivity of atomic fluorescence spectrometry which allows mercury analysis down to sub ppt detection limits with with 107x linearity.



Sir Galahad Mercury Analyzer in Gaseous Sample

- ◆ Is specifically designed for measuring mercury in gaseous samples at both online & offline installations.
- ◆ Mercury is measured using atomic fluorescence detection which allows absolute detection levels of below 0.1picogram.



Millennium Excalibur System

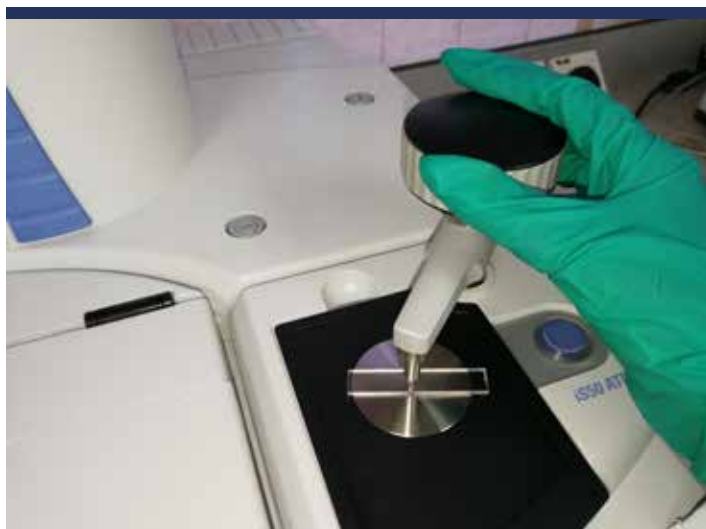
- ◆ Is able to measure Arsenic, Selenium, Antimony, Bismuth, Tellurium in solids, sludges, liquids, blood, seafood, crude oil and natural gas.
- ◆ A unique feature of the Millennium software is the ability to use one computer to control multiple instruments analyzing different elements.
- ◆ Ability to extend analytical capability to mercury.



Online Mercury Analyzer

- ◆ Is specifically designed for measuring mercury continuously in dynamic systems such as environmental and industrial plants.
- ◆ Offers a comprehensive user friendly software package for data acquisition, statistical analysis, reporting and display.

ESSENTIAL TOOLS FOR POLYMER CHARACTERIZATION



MOLECULAR SPECTROSCOPY

Instruments

- ◆ Fourier Transform Infrared Spectroscopy (FTIR)
- ◆ Raman Spectroscopy

Applications

- ◆ Used to characterize the molecular vibrations of organic & inorganics compounds include common functional groups and fingerprinting region.
- ◆ Used for both qualitative & quantitative analysis.
- ◆ Common tools used in Academic research & various industries to perform QC Check on incoming raw material
- ◆ Analyse contamination for submicron & micron sized particles
- ◆ To study reverse engineering by FTIR hyphenation with TGA
- ◆ Used to identify microplastic particles



PHYSICAL & MECHANICAL TESTING

Instruments

- ◆ Universal Testing Machines
- ◆ Hardness Tester
- ◆ Impact Tester
- ◆ Melt Flow Indexer
- ◆ Automatic Deflection Temperature / Vicat Testing Machines

Measurement

- ◆ To test the strength and performance of plastics through tensile, flexural, compression, folding endurance, impact, head distortion, Vicat, melt flow, tear and puncture tests.
- ◆ This versatile benchtop polymer testing machines can perform tests in accordance with ASTM, ISO and other international standards from test configuration through to reporting and generating results immediately for your processes.



SURFACE SCIENCE

Instruments

- ◆ Contact Angle Instruments

Measurement

- ◆ Offers the capability to measure the Contact Angle between the liquid and solid phase, Surface Free Energy of solid substrate and Surface Tension of a liquid.
- ◆ Used to predict the interaction between the liquid-solid phase.

Applications

- ◆ Widely used in industries for surface modification such as plasma cleaning.
- ◆ To study the hydrophilic & hydrophobic properties of a surface.
- ◆ In the chemical dispersion industry, it is used to study the surface tension of a liquid by comparing different surfactants and adjusting the surfactant concentration.



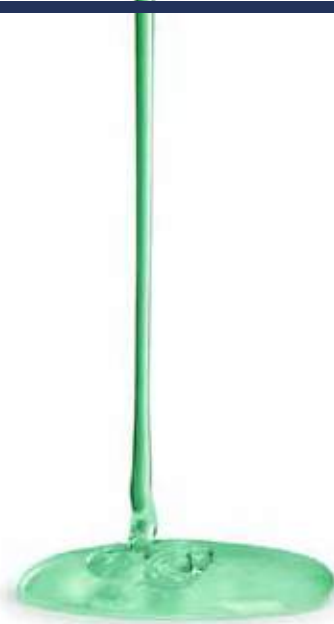
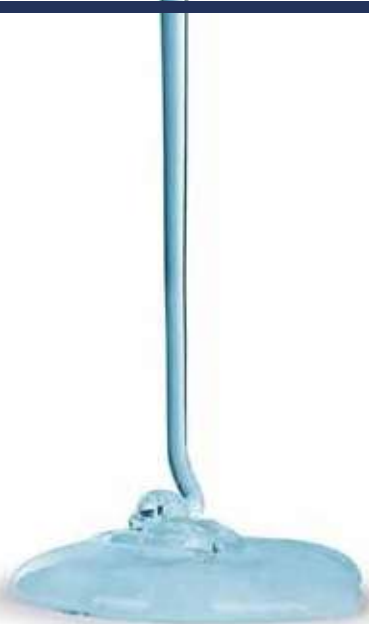
THERMAL CHARACTERIZATION

Instruments

- ◆ Differential Scanning Calorimetry (DSC)
- ◆ Thermogravimetric Analysis (TGA)
- ◆ Dynamic Mechanical Analysis (DMA)
- ◆ Simultaneous Thermal Analysis (STA)
- ◆ Thermomechanical Analysis (TMA)

Applications

- ◆ Changes in the morphology of a material usually affects its melting, crystallization and/or glass transition, these can be linked to many performance parameters. For semi crystalline polymers it is an important method to measure crystallinity and for thermoset polymers the curing behaviour that is being analysed.
- ◆ Thermogravimetric analysis (TGA) determines the composition & thermal stability of polymers and the effect of additives such as flame retardants.
- ◆ Dynamic mechanical analysis (DMA) is indispensable in the characterization of viscoelastic properties of filled polymers including elastic modulus, loss modulus and the glass transition



RHEOLOGY & VISCOMETRY

Instruments

- ◆ Capillary Viscometer
- ◆ Capillary Rheometer
- ◆ Rotational Rheometer

QC Parameter

- ◆ Plastic manufacturers need to verify the molecular mass / chain length of their polymers to assure and maintain quality. Determination of the solvent viscosity as a measure of the mean molecular mass of a polymer is one of the most reliable and sensitive methods for judging the molecular identity of many plastics.

Applications

- ◆ To measure the solution viscosity that is in accordance to the international norm (ASTM, ISO, DIN) by capillary viscometer.
- ◆ The shear rate of a capillary rheometer mimics the extrusion or injection moulding machines, from 100 to $> 10^6$ 1/s. The apparent melt viscosity is given as shear stress/shear rate. It can also determine extensional viscosity, die swell and melt strength.
- ◆ Rotational rheometers provide information on viscoelastic properties of polymers. In the oscillation mode, it can provide complex viscosity and probe into the molecular structure of the polymer, like molecular weight, molecular weight distribution and molecular weight average.
- ◆ To determine the shear viscosity in the steady (flow) mode, albeit, at lower shear rates from 0.001 to 100 1/s.



PARTICLE CHARACTERIZATION

Instruments

- ◆ Particle Size Distribution Analyzer

Optimization

- ◆ It is usual for a continuous emulsion polymerization process to control the emulsion droplet size in the main reactor or mixing device. The emulsion formed in the process is desired to be of a narrow size distribution with a specific range of sizes from a few microns to thousands of microns.
- ◆ In the granulating process, the powder properties such as particle size distribution, specifically the amount of fine and coarse fractions are needed to prevent the clogging of the process line.

Applications

- ◆ Polymer based industrial products such as acrylic paint emulsion and coatings are routinely checked for their particle size distribution.
- ◆ Formation of the non-stick Teflon® coating layer for cooking utensils to ensure good adhesiveness and durability.



POLYMER PROCESSING

Instruments

- ◆ Measuring Mixers & Extruders
- ◆ Single & Twin Screw Extruders
- ◆ Torque Rheometer

Measurement

- ◆ To study the compatibility of fillers and additives with the polymer matrix at the laboratory scale. The recorded torque value, temperature, pressure and speed provide the information to optimize the process parameters as well as for upscaling purposes.
- ◆ Various accessories are available for the Single Screw & Twin-Screw Extruders, so that in addition to material compounding, the extrudate can be turned into round strand die, pellet, sheet, blown film etc.
- ◆ To study the decomposition time, fusion time, flow & cure behaviour, plasticizer and sorption behaviour of the polymer mixing, the Brabender Torque Rheometer is the ideal tool.



FIRE TESTING SYSTEMS

Instruments

- ◆ UL 94 Testing System
- ◆ Limiting Oxygen Analyzer
- ◆ TCC Cone Calorimeter
- ◆ KBT Fire Testing Systems for Cables

Measurement

- ◆ To examine the burning behaviour of plastics at different oxygen content.
- ◆ Measuring the smoke production & toxicity and heat release for polymeric materials.
- ◆ Measure the flame spread with flaming droplets.

Applications

- ◆ To measure the reaction & response of polymer composites used in printed circuit board (PCBs), electrical cables, textile products, etc in fire.
- ◆ Determine the suitability and effectiveness of different types of flame retardant additives in polymers, depending on their applications.

LAB TESTING SERVICES

◆ **Material Analysis** ◆ **Particle Analysis** ◆ **Thermal Analysis**

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Send Us Your Samples, We Will Provide You RESULTS!

Main Bench FTIR (iS10 FTIR)

Functions:

- ◆ FTIR is commonly used for material identification. When IR radiation is passed through a sample, some radiation is absorbed by the sample and some passes through (is transmitted). The resulting signal at the detector is a spectrum representing a molecular 'fingerprint' of the sample. The usefulness of infrared spectroscopy arises because different chemical structures (molecules) produce different spectral fingerprints.

Applications:

- ◆ FTIR can be a single purpose tool or a highly flexible research instrument. With the FTIR configured to use a specific sampling device – transmission or ATR for instance – the spectrometer can provide a wide range of information:
 - ◆ Identification of an unknown
 - ◆ Identification of mixture
 - ◆ Quantitative information, such as additives or contaminants
 - ◆ Correlation studies for material quality check

Sample Requirement:

- ◆ Solid, Powder, Films, Liquid

Laser Scattering Particle Size Analyzer

Functions:

- ◆ Laser Scattering is the most popular modern sizing technique used for the determination of submicron to millimetre sized particles. The basic workflow of a laser diffraction particle size analysis breaks down into two parts:
 - ◆ Measure scattered light angle and intensity
 - ◆ Transform that scattering data into a particle size distribution

Applications:

- ◆ Latex & Chemical Dispersion, Food & Coloring, Pigment & Ink, Pharmaceuticals, Cosmetics, Ceramics, CMP slurry, Metal powder, Resin & polymer and Soil & fine sand.

Sample Requirement:

- ◆ Dispersion, Emulsion, Suspension, Powder



Microscope FTIR (iN10)

Functions:

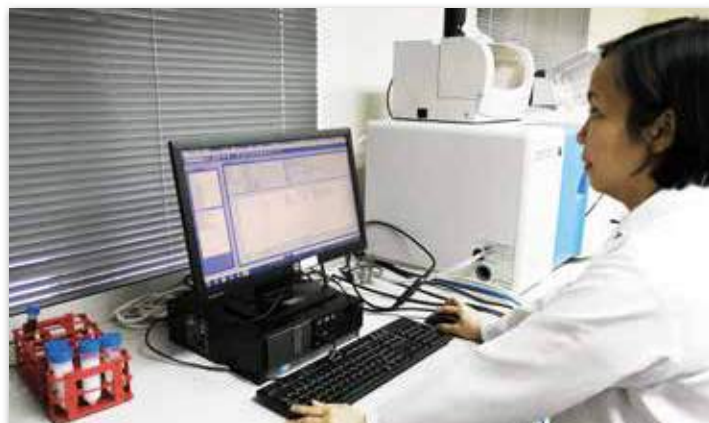
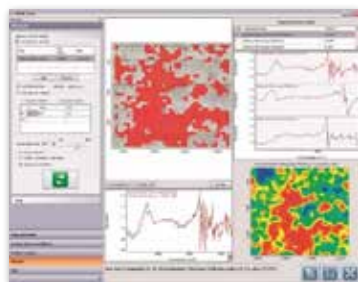
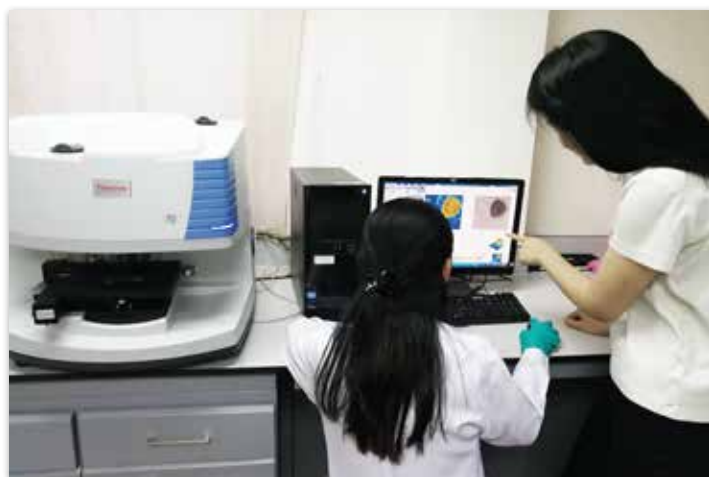
- ◆ Characterize microscopic samples for quality control, analytical services, research or academia for the analysis of a wide variety of materials such as food, pharmaceuticals, polymers, packaging, coatings, chemicals, and textiles.

Applications:

- ◆ Micron size particle identification
- ◆ Contamination studies
- ◆ Material distribution with area mapping

Sample Requirement:

- ◆ Solid, Powder, Films, Liquid



LAB TESTING SERVICES

- ◆ Material Analysis
- ◆ Particle Analysis
- ◆ Thermal Analysis

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Send Us Your Samples, We Will Provide You RESULTS!

Differential Scanning Calorimeter (DSC)

Functions:

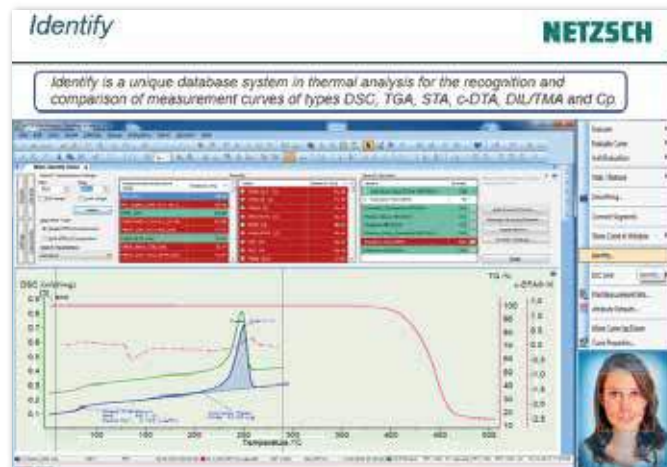
- ◆ Techniques in which changes of physical or chemical properties of the sample are monitored against time or temperature, while the temperature of the sample is programmed.

Applications:

- ◆ DSC measures endothermic and exothermic heat flow. Transitions include the glass transition, heat capacity, melt, crystallization, curing, oxidation.

Sample Requirement:

- ◆ Solid, Powder, Films, Paste



Simultaneous Thermal Analyzer (TGA-DSC)

Functions:

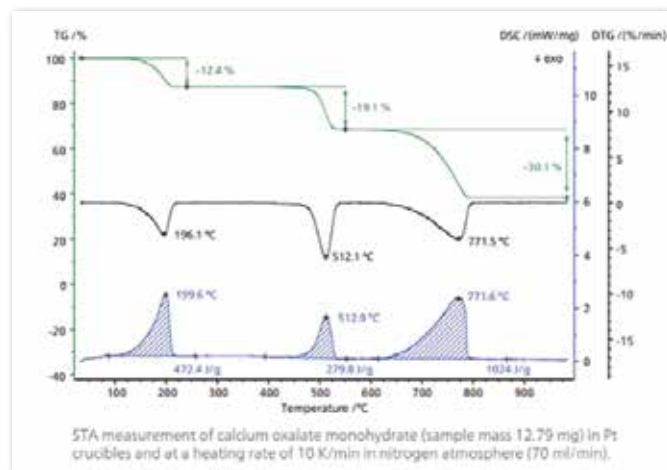
- ◆ Techniques in which changes of physical or chemical properties of the sample are monitored against time or temperature, while the temperature of the sample is programmed.

Applications:

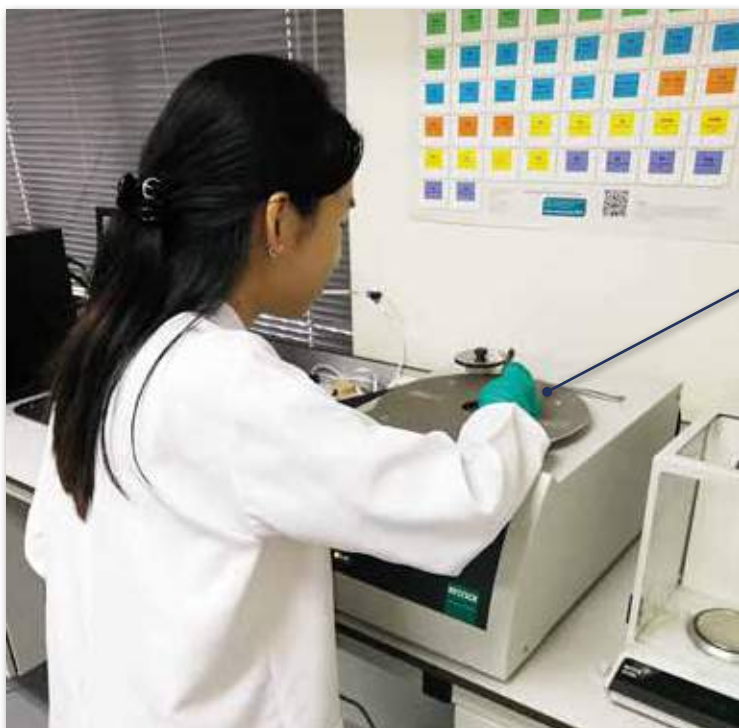
- ◆ To study the Thermal stability, decomposition behaviour, composition, phase transitions, melting processes of samples

Sample Requirement:

- ◆ Solid, Powder, Films, Paste



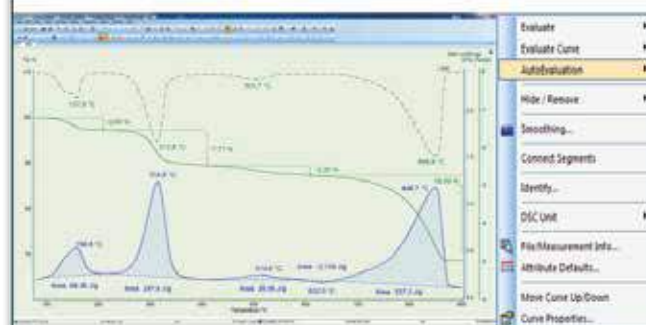
STA measurement of calcium oxalate monohydrate (sample mass 12.79 mg) in Pt crucibles and at a heating rate of 10 K/min in nitrogen atmosphere (70 ml/min).



AutoEvaluation

NETZSCH

The entire measurement is evaluated by AutoEvaluation automatically within a second. Based on curve recognition and mathematical algorithm



APPLICATION & TECHNICAL SUPPORT

We have dedicated team of Application Chemists and Engineers, with factory trained expertise offering the very best in terms of pre and post sales support for the analytical systems we supply.

Pre Sales:

- ◆ Demonstration and Presentation of Application & Solution
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Post Sales:

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- ◆ Troubleshoot Systems and Application Assistance
- ◆ Data Interpretation and Result Analysis

We offer customized training and seminars for customers with differing backgrounds to enhance your application knowledge and the know-how of the instrument. Training courses include both theoretical and practical hands-on sessions.



Training classes or groups are kept to minimum with the objective that you learn the vital skills of operation, maintenance and system troubleshooting. Interactive questions and answers with our trainers to clarify your areas of concern, are highly encouraged.



Available courses include:

- ◆ Fundamental Of FTIR & OMNIC Software
- ◆ FTIR Spectral Interpretation Course
- ◆ HPTLC Technique
- ◆ TGA & DSC Training
- ◆ Fundamental Laser Diffraction For Particle Size Analysis



No matter what your knowledge level is, we are here to provide the appropriate level of education. With continuous and effective learning, you can be a lifetime learner with us to enhance your knowledge and skills in serving the analytical and research industries.

SERVICE & MAINTENANCE

The service and application support team in Nexus Analytics is dedicated to providing day-to-day operations support and maintenance to our valued clientele.

As a total solutions provider, our service and application support ranges from sourcing to method development and after-sales service. We provide more than just instruments, our forward approach to meeting our customer's expectations and needs enables us to offer comprehensive customized solutions as part of our ongoing effort to help our customers maximize their return on investments.

Among the services and support provided by us:

- ◆ Instrument Installation and commissioning
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- ◆ Instrument upgrades & refurbishing services
- ◆ Operations and user maintenance training
- ◆ Re-location services
- ◆ Instrument IQ / OQ / PQ
- ◆ Preventive Maintenance provided for contract and non-contract customers



“

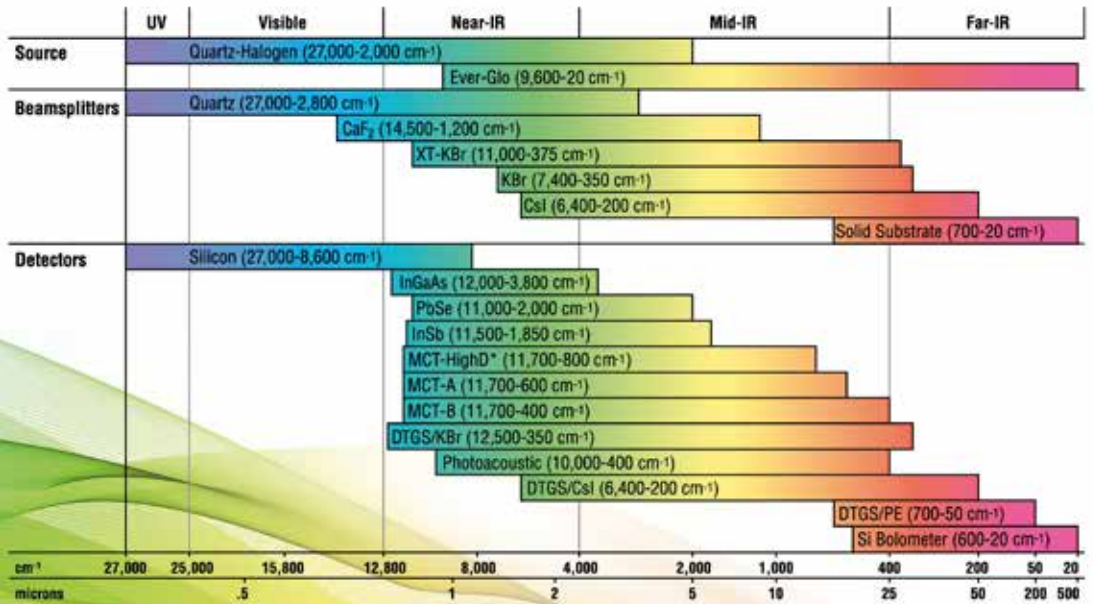
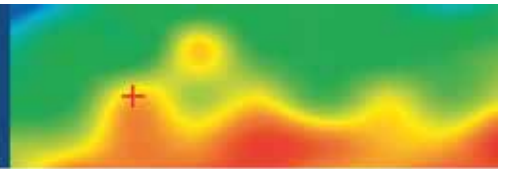
Our engineers & application chemists are factory trained & compliance certified to meet local & internationally recognized standards.

”

APPENDIX

spectral range configuration

reference chart

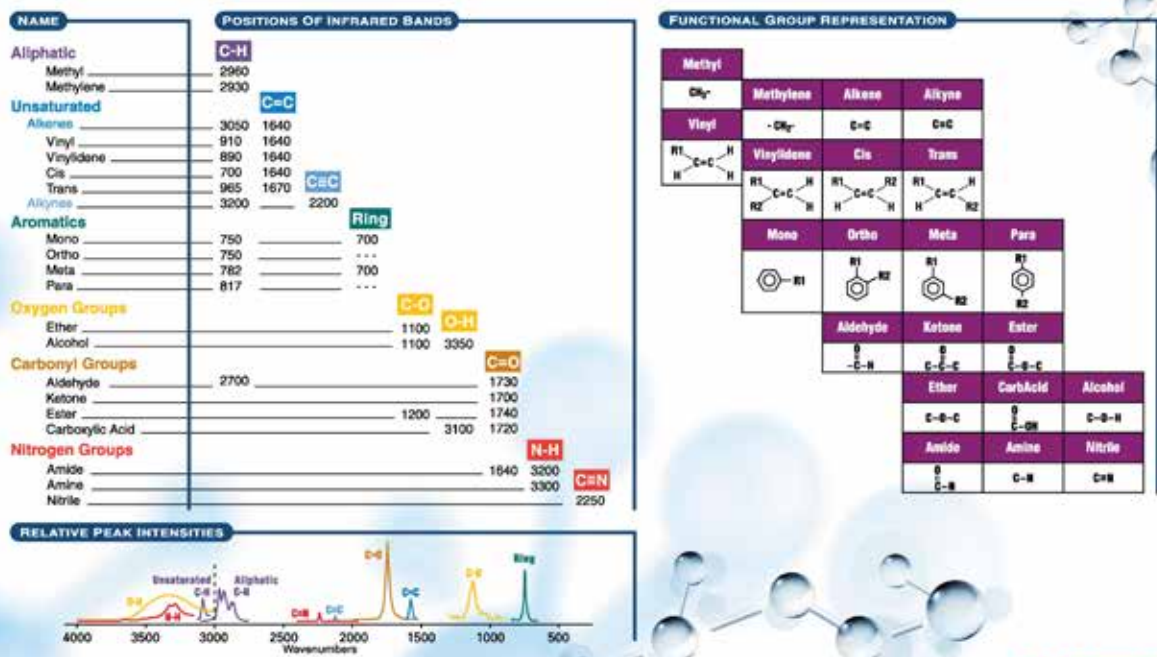


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basic organic functional group

reference chart



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