Taawon

CHOICE OF EXCELLENCE

PRODUCT CATALOG

FOOD, BEVERAGE, AND FEED

CHOICE OF EXCELLENCE

www.taawon.com

ABOUT TAAWON GROUP

Welcome to Taawon Group – Your Premier Partner in Laboratory Solutions!

At Taawon Group, we specialize in providing an unparalleled range of high-end laboratory and industrial equipment, disposables, and chemical products. Our commitment revolves around delivering excellence, compatibility, and exceptional value and support.

Discover a world of reliable solutions tailored to elevate your laboratory experience. Taawon Group is here to redefine standards and exceed expectations in the pursuit of scientific excellence.

OUR VISION

To be the leading partner in advancing laboratory and industrial technologies across the region, recognized for empowering innovation with a comprehensive range of reliable, cutting-edge systems and solutions.

OUR MISSION

Our mission is to empower our customers' success by delivering superior-quality laboratory and industrial equipment, with high customer satisfaction rate, enabling measurable improvements in their operational performance each year

TAAWON GROUP JOURNEY

Since its establishment, Taawon Group has grown from a local supplier into a trusted regional leader in laboratory and scientific equipment. Over the years, we have expanded our portfolio, forged global partnerships, and introduced pioneering technologies to the Middle East market. Today, our legacy is built on decades of expertise, innovation, and unwavering commitment to customer success.

2008

Taawon Founded in Jordan

2009

Diamond Spectrum Founded in Saudi Arabia

2013

Altayf Althahabi (TTSL) Founded in UAE

2019

Companies incorporated under Taawon Group

2021

Diamond Spectrum Founded in Bahrain

ASSOCIATION & GROUP COMPANIES

Taawon
Jordan

Diamond Spectrum - DS
Saudi Arabia

Altayf Althahabi - TTSL
United Arab Emirates

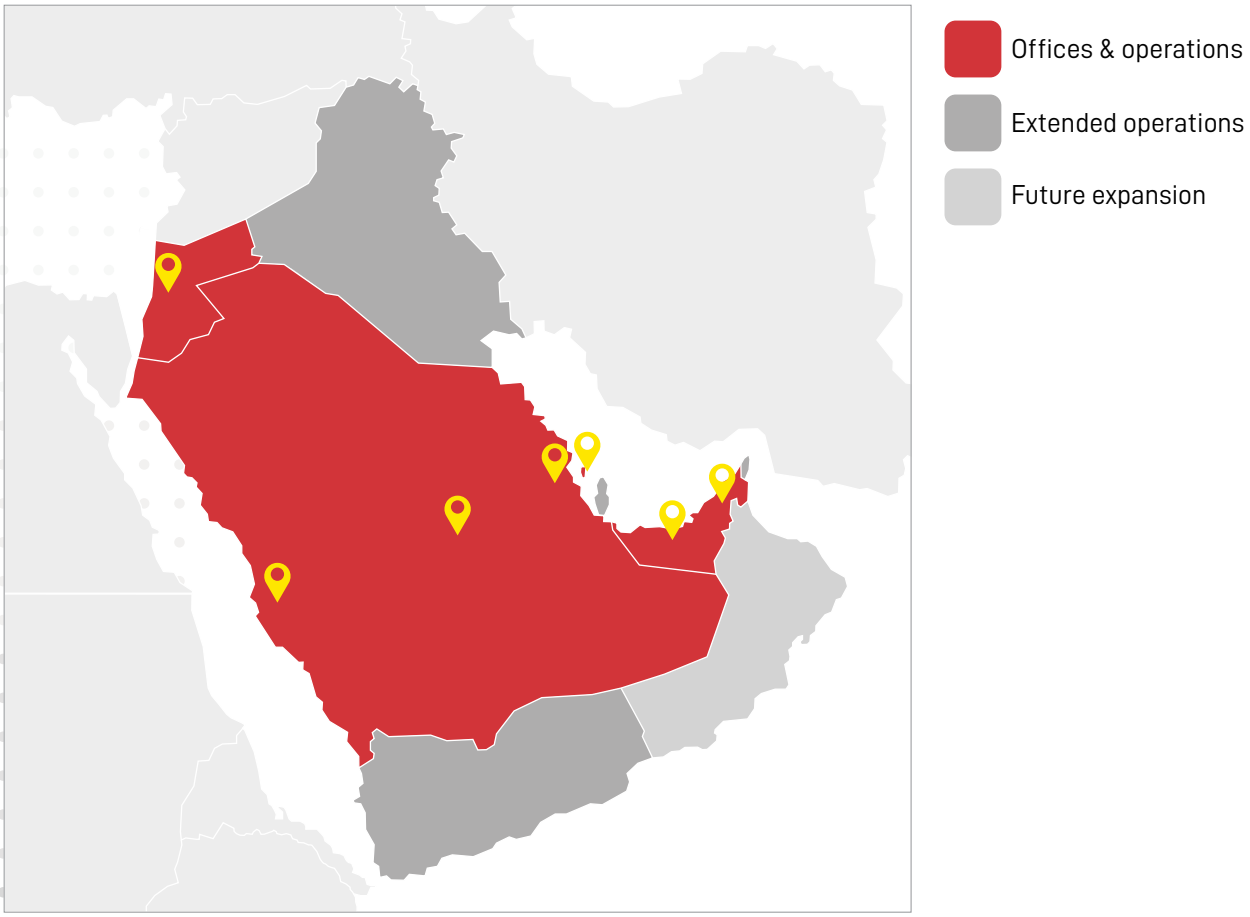
Diamond Spectrum - DS
Bahrain

4000 + customers

100 + employees

4 countries

7 offices



APPLICATIONS & INDUSTRIES

Taawon Group offers a comprehensive portfolio of laboratory, industrial, and scientific solutions designed to meet the highest industry standards and regulations in a wide variety of sectors.

Pharmaceuticals

Energy & Petrochemicals

Chemicals

Food, Beverage &Feed

Academia & Research

Nano technology

Material Testing

IVF and Life Science

Warehouse Monitoring

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METTLER TOLEDO

Laboratory Balances

Laboratory Balances

Analytical Balances

XPR Balances

- The XPR series spans from ultra-micro to high-capacity precision, covering capacities from as low as a few grams up to 64 kg.
- Micro-analytical models feature readabilities down to 0.0001 mg with typical repeatability of 0.00015 mg at 5 % load.
- Analytical models (e.g. XPR106DUH, XPR205) achieve readabilities of 0.005 mg to 0.01 mg with minimum weights (k=2, U=1 %) starting from ~0.6 mg.
- Integrated quality assurance functions like GWP Approved, StatusLight, and LevelControl actively monitor weighing conditions and enforce process tolerances.
- StaticDetect detects electrostatic charge on sample or container and issues warnings, and can be paired with ionizing modules to eliminate static effects.

XPR Essential Balances

- XPR Essential balances offer connectivity via Ethernet, 3 × USB-A, and USB-B ports for flexible data handling.
- The analytical models include a 7-inch color touchscreen (glove-compatible) for intuitive control and input.
- They feature motorized draft-shield doors that open with one touch to streamline sample access.
- Built-in quality assurance includes StatusLight, LevelControl, and MinWeigh warning to enforce process boundaries.
- Analytical versions use a hanging weighing pan with high-performance load cell for precise weighing of small samples.

Laboratory Balances

Analytical Balances

MX Balances

- MX balances feature the SmartPan weighing pan that reduces air-draft effects and accelerates stabilization.
- They include FACT (Fully Automatic Calibration Technology) for internal self-adjustment to maintain accuracy over environmental changes.
- MX models offer connectivity via USB, Ethernet, and optional Bluetooth for data transfer and system integration.
- Quality assurance tools such as StatusLight, routine test guidance, and user management support compliance workflows.
- Precision variants can deliver readabilities down to 0.01 mg, making them suitable for demanding analytical applications.

MR Balances

- MA balances cover a weighing range from 50 g up to 5 kg with readabilities as fine as 0.00001 g
- They employ a MonoBloc™ load cell and internal automatic weight adjustment for sustained high precision
- Touch control interface with guided menus and automatic calculations streamline routine weighing tasks
- Strong metal base and durable outer housing provide chemical resistance and ease of cleaning
- Communication options include USB-A and RS232, along with passcode protection to guard settings against unauthorized changes

Laboratory Balances

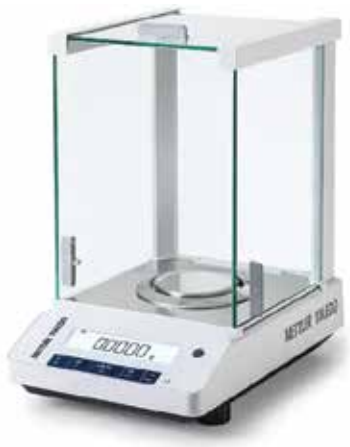
Analytical Balances

MA Balances

- MA balances support capacities from 50 g up to 5 kg with readabilities as fine as 0.00001 g
- They employ a MonoBloc™ weighing cell for reliable measurement stability
- The user interface offers built-in applications and automatic calculations to streamline weighing workflows
- The housing is constructed with a strong metal base and chemical-resistant outer shell to withstand harsh lab conditions
- Communication is enabled via USB-A and RS232 interfaces, with password protection to secure configuration settings

LA Balances

- LA balances provide readabilities down to 0.0001 g with capacities from 80 g to 4 kg
- They use a precise electromagnetic force compensation (EMFC) load cell for fast and stable weighing
- Built-in functions include dynamic weighing and piece counting to simplify common workflows
- The balances offer RS232 communication for printer, secondary display, or PC interface
- They incorporate metal base construction, overload protection, and setting locks to ensure durability and process integrity



Laboratory Balances

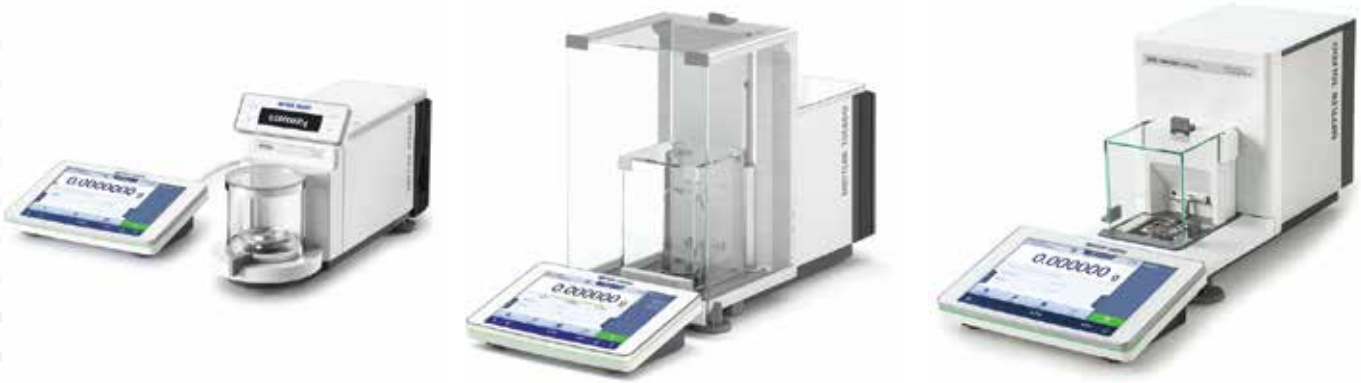
Precision Balances and Scales

- Precision balances support capacities from 120 g up to 64 kg and readabilities between 1 g and 0.1 mg
- Lower-readability models incorporate draft shields while high-capacity models use large weighing pans to accommodate bulk loads
- The SmartPan / SmartPan Pro weighing pan reduces air-draft influence, doubling speed and improving repeatability
- Connectivity options include RS232, USB, and LAN interfaces, with optional Bluetooth/WLAN support
- Construction features include metal housings, overload protection, smooth surfaces, and rounded edges for durability and ease of cleaning
- Many models offer built-in weighing applications (e.g. formulation, dynamic weighing, piece counting) to streamline processes
- Precision balances may include LevelControl which issues warnings when the balance is not properly leveled
- The MinWeigh function ensures sample weights below the minimum accuracy threshold are flagged (displayed in red) and not released
- Some balances support glove mode for operation while wearing disposable or reuseable gloves
- Capacities above 10 kg are supported by large platform models with 0-3 decimal place readability suitable for heavy and bulky items

Laboratory Balances

Microbalances

- Capacity up to 52 g with readability down to 0.1 µg, enabling measurement of samples as low as 30 µg
- High-performance weighing cells with exceptional repeatability and low minimum weight capability
- Built-in quality assurance via Tolerance Profiles and audit-proof monitoring of weighing status
- SmartView terminal design allows separation of the display from the weighing chamber for ergonomic placement
- Draft shield is cylindrical with all-round visibility and automatic (touchless) door operation
- Compact footprint minimizes space usage and supports installation in confined environments
- Intuitive touchscreen interface with guided method library and easy operation for repetitive tasks
- Internal results notepad automatically records all measurement parameters and results
- Easy removal and cleaning of draft shield components and weighing pan without tools
- Optional electrostatic ionizer modules and StaticDetect support detection and mitigation of sample charging



Laboratory Balances

Moisture Analysis Solutions

- Moisture analyzers use the loss on drying (thermogravimetric) method, combining a balance and halogen heating unit for moisture measurement.
- These analyzers deliver rapid and precise moisture content determination through advanced weighing technology and precise temperature control.
- The QuickPredict feature enables prediction of final results early, reducing measurement time for certain models.
- Connectivity is enabled via USB, Ethernet, and RS232 interfaces, supporting data transfer and integration into lab systems.
- Routine checks are simplified via SmartCal, a quick 10-minute performance test to verify overall instrument function.
- The Method Wizard assists in creating custom drying methods directly on the instrument for reproducible protocols.
- Multiple instruments (up to five) can be managed via EasyDirect™ Moisture PC software, centralizing data for visualization and storage.
- ID management supports sample tracking via barcode reader integration for some analyzer models.
- Robust construction with durable housing allows operation even under harsher industrial or laboratory conditions.
- User management and auto-lock features enforce method control and compliance in user workflows.

Laboratory Balances

Test Weights

- Test weights from 50 µg up to 5 tons cover the full calibration range for balances and scales
- Supplied in OIML and ASTM classes to meet different levels of metrological accuracy
- Available as single weights, weight sets, reference weights, and microgram weights for various application
- Manufactured from stainless steel (austenitic) with corrosion resistance for long-term stability
- Knob weights, wire weights, and sheet weights are offered for fine and micro ranges, some with adjusting cavities
- Weights come with or without calibration certificates, supporting traceability where required
- Heavy-capacity and crane weights include stackable cast iron or stainless steel designs for ton-scale calibration
- Weight sets range from 1 mg up to 5 kg (or more) in various combinations to support stepwise calibration
- Accessories such as tweezers, forks, gloves, and cleaning cloths are provided for proper handling and maintenance
- METTLER TOLEDO's GWP® Recommendation service helps select the correct weight class and value for routine verification tasks

Laboratory Balances

Software for Laboratory Weighing

Laboratory Balances

Software for Laboratory Weighing

LabX Balance Software

- LabX Balance enables centralized control of instruments, tasks, and users across a network
- SOP guidance is displayed directly on the balance terminal to enforce correct procedures
- Automatic data transfer eliminates manual transcription by sending results directly into the LabX database
- Users can define differential weighing sequences and templates to match regulatory and process requirements
- LabX supports audit-proof user management, electronic signatures, and traceable workflows

EasyDirect Balance Software

- Collects weighing data from up to 10 balances via RS232 or Ethernet.
- Records results automatically in the background for continuous logging.
- Exports data in CSV, XLSX, XML, or PDF formats.
- Provides control charts and statistical analysis for trend monitoring.
- Includes access protection to secure results and instrument settings.

Moisture Analyzer Software

- Connects up to 5 moisture analyzers in one database.
- Transfers data via USB, Ethernet, RS232.
- Supports OneClick method launch with user guidance.
- QuickPredict speeds up moisture results.
- Enables sample ID tracking with barcode support.

METTLER TOLEDO

Analytical Instruments

Analytical Instruments

Titration Solutions

Titrators

- Control the addition of titrant to determine analyte concentrations by tracking reaction endpoints with high precision
- Modular platforms allow integration with autosamplers, multiple burettes, and sensors to broaden application capabilities

Karl Fischer Titrators

- Specifically designed to measure water content in solids, liquids, and gases using volumetric or coulometric techniques
- Support water determinations from low ppm levels up to 100 % content in samples

High-throughput Titration Systems

- Include carousel autosamplers (e.g. Rondolino) to automate sample throughput for general titration tasks
- Reduce manual intervention and increase consistency across titration processes

Titration Sensors

- Robust electrodes and probes optimized for pH, redox, ion-selective, or conductivity titration endpoints
- Designed for durability and accuracy in diverse sample matrices, ensuring precise endpoint detection

Analytical Instruments

Portable pH Instruments

Seven2Go

- Offers portable measurement of pH, conductivity, dissolved oxygen, and ion concentration in one handheld unit.
- Designed with waterproof/dustproof protection (IP67) and supports storage of up to 200 measurements.
- Features temperature measurement capability with resolution 0.1 °C across range –5 °C to 105 °C.

SevenGo Duo

- Multiparameter, handheld meter supporting pH, conductivity, ion concentration, and dissolved oxygen in one instrument.
- Operates in dual-channel mode, enabling simultaneous measurement of two parameters or samples.
- Engineered for routine field and lab use with ruggedness and ease of operation in varied conditions.

FiveGo

- Portable field meter engineered to measure pH, conductivity, ORP, and dissolved oxygen for water, soil, and food samples.
- Built with IP67 waterproof/dustproof rating and an intuitive menu for quick measurement workflows.
- Offers pH measurement resolution of 0.01 and accuracy of ±0.01 across the full 0–14 pH range.

Analytical Instruments

Benchtop pH Instruments

SevenDirect

- Benchtop meter that measures pH, ion concentration, and conductivity with built-in GLP support.
- Designed for intuitive operation, featuring automatic sensor recognition and calibration reminders.
- Some models (e.g. SD20) include ORP measurement capability and use a sensor arm (EasyPlace) for consistent probe positioning.

SevenExcellence

- Multi-channel benchtop pH system supporting measurements of pH, conductivity, dissolved oxygen, redox, and ion concentration.
- Enables precise, simultaneous measurements with modular sensor inputs.
- Provides high flexibility for complex analytical workflows through parameter expandability.

NineFocus

- Modular multiparameter benchtop system allowing up to four electrochemical measurements (e.g. pH, redox, conductivity, DO) in one unit.
- Designed to handle ultra-low volume samples with high precision.

FiveEasy

- Benchtop meter engineered for pH/mV or conductivity measurements in routine analytical tasks.
- Compact design intended to provide reliable, accurate performance in a simple and economical format.
- Suitable for laboratories needing straightforward, robust pH or conductivity testing without additional functionalities.

Analytical Instruments

Portable Density Measurements

- Portable density meters use the oscillation tube (U-tube) method to measure liquid density accurately.
- They support derived parameters such as specific gravity, Brix, and concentration, converting density into meaningful units.
- Built-in temperature compensation ensures accurate readings despite sample temperature variation.
- Many models are handheld or pocket-sized, enabling measurement in the lab or field.
- Results precision is high, with three-digit resolution in density measurements.
- They can store hundreds of measurement records, enabling data logging and traceability.
- Bright, backlit displays and intuitive menus aid readability and usability in varied lighting.

Analytical Instruments

Benchtop Density Measurements

- Benchtop density meters use oscillation tube (U-tube) technology to determine liquid density and related metrics.
- They support derived scales such as specific gravity, concentration, and Brix based on the measured density.
- Automatic temperature control (or temperature compensation) is integrated to maintain measurement accuracy across varying thermal conditions.
- These instruments interface with LabX software for workflow control, data storage, and regulatory compliance.
- The “Excellence” line of benchtop density meters is positioned as an all-rounder solution for many sample types with high accuracy.
- Firmware and software features support data handling, method management, and result export in lab environments.
- These meters are engineered for stable operation in laboratory conditions, maintaining repeatability and precision across replicates.

Analytical Instruments

UV/Vis Spectrophotometry

EasyPlus UV/VIS

- Dual-beam optical design with reference detector ensures stable baseline and accurate measurements.
- Uses exchangeable XPathHolder™ cuvette carousels covering multiple path lengths, with PathDetect™ to verify selected path.
- Offers 3-in-1 functionality: spectrophotometry, color measurement (30 built-in color scales), and water analysis.
- Equipped with a xenon flash lamp (in "UV" version) for broadband UV/Vis coverage and long lamp life.
- Wavelength range spans 190 nm to 1,000 nm (for UV model), with wavelength accuracy of ±1.5 nm and resolution ≤ 0.5 nm.
- SmartLid™ enables automatic start of measurement upon closing, streamlining routine workflows.

UV/VIS Excellence

- Wavelength range from 190 to 1,100 nm, giving broad UV/VIS coverage
- Resolution better than 1.5 (toluene in hexane) with wavelength accuracy ±1.0 nm and repeatability < 0.15 nm
- Compact size (≈ 208 × 255 × 228 mm) and weight (~6.4 kg) suitable for benchtop use
- Employs FastTrack™ technology (xenon flash lamp and CCD array) for full spectrum scans in about 1 second
- No moving optical parts, enhancing mechanical stability and reducing maintenance
- Complies with pharmacopeia spec (e.g. stray light, photometric accuracy) for regulated environments

Analytical Instruments

Portable Refractometer / Brix Meter

- Measures refractive index and Brix (% w/w) with high resolution and repeatability in field or lab settings.
- Automatic temperature compensation is built in to correct readings based on sample temperature.
- Has a compact, handheld design optimized for portability and ease of use in on-site or at-line measurements.
- Offers predefined calibrations and user methods, allowing quick switch between measurement scales.
- Equipped with data logging memory, capable of storing multiple readings for later review or transfer.
- Supports digital interface connectivity (e.g. USB or similar) for exporting data to PCs or lab systems.

Analytical Instruments

Benchtop Refractometer / Brix Meter

- Uses oscillation-tube (U-tube) technology to determine refractive index and related concentration values.
- Supports derived scales such as Brix, specific gravity, and concentration conversions based on refractive index.
- Offers automatic temperature compensation to correct measurements across varying sample temperatures.
- Designed to provide fast refractive index readings in routine laboratory workflows.
- Compact, space-saving benchtop form factor optimized for routine lab use.
- Integrated software and user interface facilitate method setup, data handling, and repeatable measurement procedures.

Analytical Instruments

Melting Point Instruments

Melting Point

- The MP80 system automatically measures melting, boiling, cloud point, and slip melting point in a single instrument.
- It supports simultaneous measurement of multiple samples (e.g. up to six) to increase throughput.
- The maximum operating temperature of the MP90/MP80 class reaches 400 °C, enabling analysis of high-melting compounds.

Slip Melting Point

- Slip melting point (SMP) refers to the temperature at which a solid (e.g. fat or wax) rises in a tube when the outer surface melts under hydrostatic force.
- The instruments on the METTLER TOLEDO melting point product line support automated slip melting point determination alongside melting, boiling, and cloud point measurements.

Boiling Point

- The MP80 / Excellence systems support automatic boiling point determination as part of their multi-point thermal analysis capability (melting, boiling, cloud, slip).
- Boiling point is measured under controlled heating ramps and detection algorithms to identify the transition temperature consistent with pharmacopeial methods.
- These instruments run parallel measurements on multiple samples, enabling simultaneous boiling point analysis along with other thermal points.

Cloud Point

- Cloud point is one of the thermal transition parameters that the MP80/Excellence melting point systems can measure, along with melting, boiling, and slip melting points.
- In cloud point determination, the instrument monitors light transmittance or turbidity changes as the sample is heated to detect the onset of phase separation.

Analytical Instruments

Dropping / Softening Point Instruments

Melting Point

- Modern systems support fully automated dropping point and softening point tests on one instrument, handling multiple samples without manual intervention.
- The DP70 model can evaluate two samples simultaneously up to a maximum temperature of 400 °C.
- The DP90 variant operates across a broader range (–20 °C to 400 °C), enabling both sub-ambient and high-temperature dropping or softening analyses.
- These instruments use video imaging and digital image analysis to detect the first drop or flow front during heating, providing automation and precision.
- The systems comply with recognized standards such as IP 396 (for grease dropping point tests)
- Performance is optimized for both dropping and softening point determination, giving more flexibility in thermal characterization of substances.

Slip Melting Point

- Softening point determination is integrated with dropping point analysis in the same instrument, allowing simultaneous measurement of both transitions.
- Instruments like the DP70/DP90 can measure softening point over a temperature range up to 400 °C (or down to –20 °C in DP90) for high-temperature materials.
- The softening point is detected by video imaging and digital image analysis, observing the first sign of sample deformation or flow under heating.
- Softening point analysis follows recognized test standards, ensuring compliance with industry thermal testing methods.
- Some systems support parallel analysis of two samples, so softening point can be measured for two specimens simultaneously under identical conditions.

Analytical Instruments

Thermal Analysis Excellence

Differential Scanning Calorimetry (DSC)

- METTLER TOLEDO's thermal analysis line includes DSC systems as one of its core techniques, alongside TGA, TMA, and DMA.
- Their DSC offerings span variants like standard DSC, high-pressure DSC, and ultra-fast (chip) DSC, enabling analysis of materials under different pressures and fast thermal cycles.

Dynamic Mechanical Analysis (DMA)

- DMA characterizes viscoelastic and mechanical properties of materials under oscillatory stress, capturing modulus and damping behavior.
- METTLER TOLEDO's DMA systems offer a wide frequency range (0.001 to 1000 Hz) and support simultaneous thermal measurement (SDTA) for combined analysis.

Hot Stage Microscopy

- Hot-stage microscopy enables visual observation of thermal transitions (e.g. melting, crystallization) while the sample is heated or cooled.
- The HS84 system combines microscopy with simultaneous DSC heat flow measurement, providing complementary thermal and visual data.

Thermogravimetry (TGA)

- Thermogravimetric Analysis (TGA) tracks mass change (loss or gain) of a sample as it experiences controlled temperature, time, and atmosphere variations.
- METTLER TOLEDO's TGA instruments include advanced models such as TGA/DSC 3+ that provide exceptional weighing performance with continuous data acquisition up to 50 million points.

Analytical Instruments

Thermal Analysis Excellence

Fast Scanning Calorimeter

- The Fast Scanning Calorimeter (Flash DSC) supports ultra-high heating and cooling rates, enabling rapid thermal transitions analysis.
- It is capable of measuring under oxygen-free (inert) conditions for precise thermal behavior characterization.

High Pressure Differential Scanning Calorimetry

- High Pressure DSC instruments allow precise control of pressure, atmosphere type, and purge gas flow rates during thermal analysis
- The HP DSC 2+ variant uses advanced sensors (FRS 6+ and HSS 9+) to ensure high performance under elevated pressure conditions

Simultaneous Thermal Analyzer (TGA/DSC)

- Simultaneous TGA/DSC instruments measure mass changes (TGA) and heat flow events (DSC) in a single run, allowing direct correlation of thermal and mass transitions.
- The TGA/DSC 3+ model supports modular sensor configurations (SDTA, DTA, DSC) and built-in gas flow control to analyze samples under defined atmospheres.

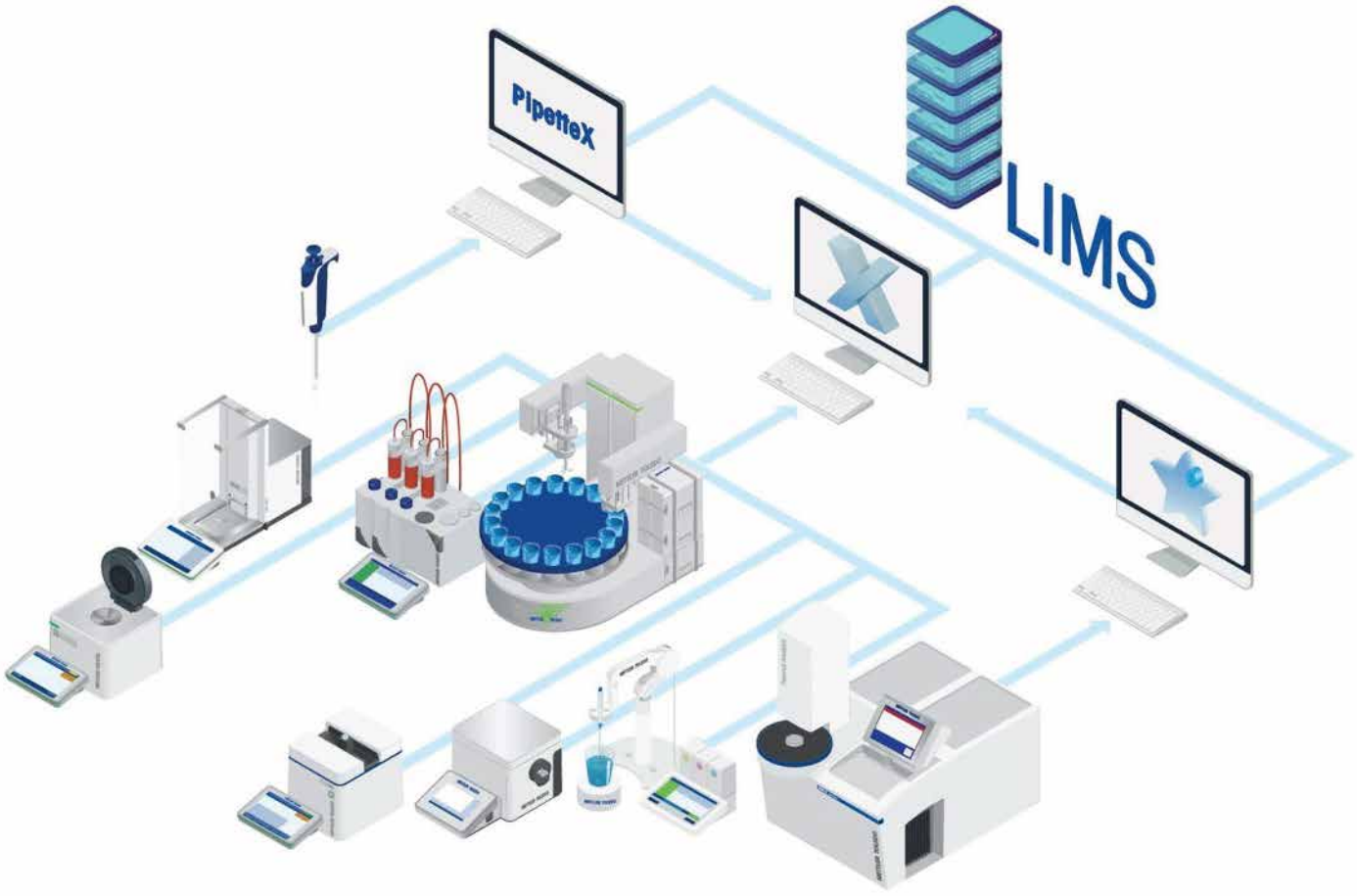
Thermomechanical Analysis (TMA)

- TMA (Thermomechanical Analysis) quantifies dimensional changes (expansion, contraction, deformation) of a material as a function of temperature.
- METTLER TOLEDO's TMA/SDTA 2+ system features Swiss precision mechanics and supports extended temperature ranges (–150 °C to 1,600 °C) with variable applied forces (e.g. in DLTMA mode).

Analytical Instruments

Laboratory Software Solutions

- The Lab Software suite works to centralize control over laboratory instruments, data, workflows, and user roles.
- LabX is a core platform that manages multiple METTLER TOLEDO lab instruments in a unified software environment.
- LabX supports instrument method downloads, result collection, and audit trail generation for regulatory compliance.
- EasyDirect is a simpler software tool focused on automatic data transfer from instruments to a PC to improve data management.
- The lab software solutions are designed to enhance the performance of laboratory instruments by enabling smarter data handling and workflow orchestration.
- These software products support electronic data management, reducing manual entry and transcription errors in the laboratory.
- Lab Software supports central resource allocation and usage monitoring across lab instruments and workstations.
- The platform also underpins laboratory compliance, providing features like audit trails, versioning, and traceable records.



SHIMADZU

Excellence in Science

Chromatography Systems

Chromatography Systems

Liquid Chromatography

HPLC/UHPLC/SFC Systems

- Shimadzu offers both integrated and modular HPLC / UHPLC configurations tailored to diverse analytical workflows.
- The Nexera series incorporates AI, IoT, and digital diagnostics for automated performance monitoring and reduced downtime.
- Features such as Flow Pilot and Nexflow enhance pressure stability, control startup flow, and minimize extra-column dispersion.

Preparative HPLC Systems

- Designed for purification and isolation of target compounds after synthesis or extraction with high purity and recovery.
- The product line includes Nexera Prep, Nexera UC Prep, and UFPLC systems optimized for large-scale preparative applications.
- Complementary modules like fraction collectors, flow splitters, and liquid handlers enable flexible, automated workflows.

GPC Systems

- Shimadzu's size exclusion chromatography (SEC) technology separates molecules based on hydrodynamic size.
- Larger molecules elute earlier, while smaller ones penetrate porous beads and elute later.
- Shim-pack SEC columns ensure high precision and reproducibility for polymer and biomolecular analysis.

Ion Chromatograph Systems

- Ion exchange chromatography (IEX) separates analytes by ionic charge differences using cation or anion exchange resins.
- Shim-pack IC and Bio IEX columns are optimized for selective charge-based separations.
- Controlled mobile phase conditions maintain ionic equilibrium, improving reproducibility and peak resolution.

Chromatography Systems

Liquid Chromatography

LC Software

- Shimadzu LC systems feature intuitive software platforms for method setup, instrument control, and data management.
- Integrated diagnostics and predictive maintenance functions enable automated issue detection and system recovery.
- Smart automation tools reduce manual intervention and enhance laboratory productivity.

LC Components & Accessories

- Shimadzu LC platforms integrate precision pumps, autosamplers, and detectors for high-stability operation.
- Intelligent hardware functions, such as bubble detection and maintenance alerts, improve reliability and uptime.
- Energy-saving features like automatic standby reduce power consumption by over 95 % during idle operation.

LC Columns

- The Shim-pack series covers reversed phase, normal phase, HILIC, preparative, microscale, SEC, ion exchange, and SFC modes.
- Shim-pack Arata columns deliver superior peak shapes for basic compounds under challenging conditions.
- Shim-pack FC-ODS combines 3 µm particle size with 2 µm-level efficiency, ensuring fast and high-resolution separations.

LC Consumables

- Consumables include plungers, seals, filters, diaphragms, and check valves for solvent delivery systems.
- Autosampler consumables comprise needle seals, suction filters, septa, and rotor/stator parts.
- Detector consumables include deuterium lamps and flow cells, ensuring consistent optical performance.

Chromatography Systems

Gas Chromatography

GC Systems

- Shimadzu's GC lineup includes models designed for sensitivity, throughput, and modular expandability.
- The systems supports up to three injection units and four detectors simultaneously, enabling multi-channel analytical configurations.
- Systems utilize advanced electronic flow controllers and modular inlet/detector designs to ensure reproducibility, flexibility, and long-term stability.

GC Software

- PONAsolution software integrates with LabSolutions to perform detailed hydrocarbon analysis
- Features include automatic retention index correction (AART), dual line analysis, and unified data handling in a single file for simplified workflows.
- Shimadzu GC drivers for OpenLab CDS allow full instrument control, supporting multiple GC units, injectors, and detectors

GC Columns

- The SH Series GC columns include fused silica, PLOT, stainless steel, and guard columns.
- Available stationary phases include 100 % dimethyl polysiloxane, diphenyl/dimethyl polysiloxane, trifluoropropyl methyl polysiloxane, and polyethylene glycol for various polarity ranges.
- A cross-reference database aligns Shimadzu SH phases with equivalent columns from major manufacturers.

GC Consumables

- Injection port septa are available in multiple materials and temperature ratings, including "Xtra Life" (400 °C) and low-bleed HT versions (up to 450 °C) for extended durability.
- Glass insert liners with or without deactivated wool are supplied for consistent sample vaporization and reduced contamination.
- Precision syringes for both manual and autosampler operation ensure accurate, repeatable sample injection with minimal carryover.

Chromatography Systems

Columns, Reagents and Consumables

Core Focus

- Core Focus represents Shimadzu's central knowledge and application hub within its consumables and reagents portfolio.
- It provides scientific insights, method guidance, and resources that support compound identification and chromatographic optimization.
- Alongside hardware and consumables, it functions as a reference platform enhancing method development and analytical reliability.

LC Columns

- Shimadzu's Shim-pack series covers multiple separation modes, including reversed phase, normal phase, SFC, SEC, HIC, and ion exchange.
- Available in a variety of particle sizes and chemistries to support applications from small molecules to biopharmaceutical analysis.
- Specialized columns such as Shim-pack Arata and core-shell types deliver enhanced peak shapes, stability, and efficiency under demanding conditions.

LC Consumables

- Includes components for solvent delivery such as plungers, seals, diaphragms, filters, and check valves to maintain pump precision.
- Autosampler consumables include suction filters, needle seals, septa, and rotor/stator assemblies for accurate and leak-free injection.
- Detector consumables like flow cells and lamps ensure long-term stability and consistent signal performance.

LC-MS Consumables

- LC-MS consumables include ESI and APCI interface probes designed for efficient ionization and stable signal transmission.
- Additional items include drain tubes, standard solutions, and rotary pump oil for proper system maintenance.
- Consumable components for the lens section and DL parts are available to maintain optimal sensitivity and ion optics performance.

Chromatography Systems

Columns, Reagents and Consumables

GC Columns

- Shimadzu's SH Series GC columns are available in fused silica, stainless steel, and PLOT designs for versatile analytical use.
- Stationary phases such as 5 % diphenyl / 95 % dimethyl polysiloxane provide high thermal stability and broad analyte compatibility.
- SH-5 columns are equivalent to USP phases G27 and G36, allowing seamless method transfer between systems.

GC Consumables

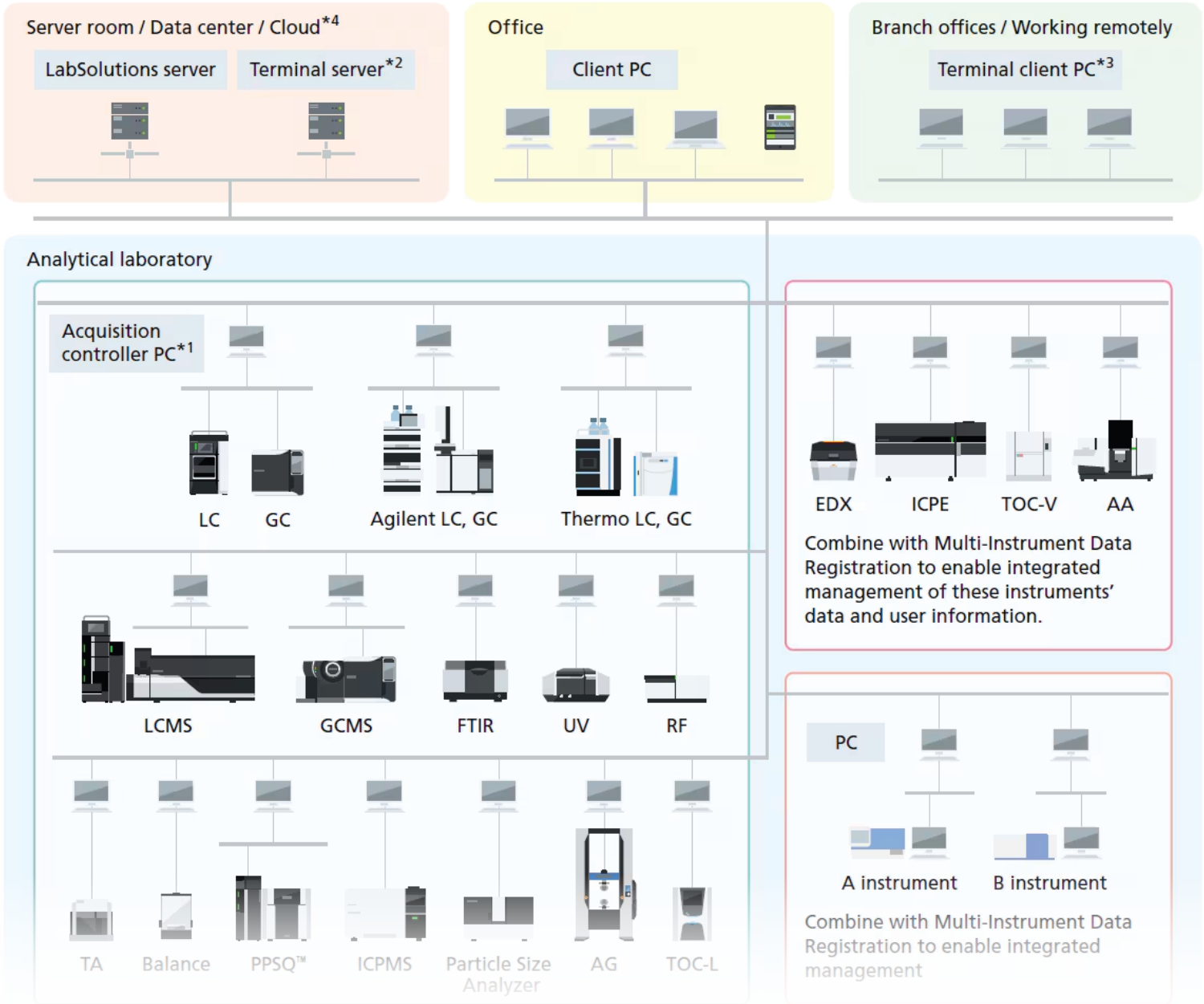
- GC consumables include injection port septa engineered for minimal bleed and high-temperature durability up to 450 °C.
- Glass insert liners with or without wool are available for capillary, PTV, and packed inlets to ensure consistent sample vaporization.
- Connectors, nuts, and ferrules such as ClickTek fittings are provided for secure, leak-free column installation.

Consumable Parts

- Includes replacement parts such as seals, filters, gaskets, and valves compatible with various Shimadzu instruments.
- A searchable database allows identification of parts by instrument type or part number for easy ordering.
- Each consumable part is designed for compatibility, long service life, and stable performance.

Vials & Accessories

- Shimadzu offers multiple vial types such as Shim-vial H glass, S glass, LabTotal, and TORAST-H vials.
- LabTotal vials minimize adsorption of basic compounds, ensuring accurate trace-level analysis.
- Accessories include caps, septa, and suction filters designed for secure sealing and sample integrity during automated analysis.



SHIMADZU

Excellence in Science

Software & Informatics

Chromatography Systems

Software & Informatics

LabSolutions™ DB/CS

LabSolutions Series	GC Software	LC Software

- Manages analytical data in a database rather than files, preventing unauthorized renaming, overwriting, or deletion and ensuring audit trails of "who, what, when" are recorded.
- Offers a "Report Set" function that bundles related analyses, logs, and conditions into one PDF for consistent review/approval workflows.
- Supports integrated control and data management of Shimadzu and non-Shimadzu LC/GC systems (e.g. Agilent, Thermo) via appropriate drivers.
- Supports both standalone (DB) and networked (CS) configurations; in CS mode, client PCs (even remote) can perform acquisition, analysis, and report tasks via terminal services without installing full software locally.

LabSolutions™ LCGC

LabSolutions Series	LC Software	GC Software

- LabSolutions™ LCGC allows control of both LC and GC instruments from the same software environment, enabling a single PC to operate multiple instruments and switch flexibly between LC and GC modes.
- It implements a Peak Integration Algorithm capable of highly accurate detection of shoulder peaks and simplifies adjustment of peak-baseline processing.
- It provides a user interface for direct access to instruments via smart devices ("User interface connecting smart devices to LabSolutions software (Direct)"), facilitating instrument connection control from mobile or external devices.

LabSolutions Insight

LC-MS Software	GC-MS Software	LabSolutions Series

- Automatically applies user-defined peak detection criteria and flags deviations across datasets, streamlining review of LC–MS and GC–MS data.
- Compatible with LabSolutions DB/CS to enable traceability, audit trails, user rights, and centralized data management.
- Supports compound grouping (e.g. summation of isomer peaks) and flexible reporting (per sample or per batch) to match various workflows.
- Manages all data-analysis metadata in a single file to produce a clear, understandable audit trail.

Chromatography Systems

Software & Informatics

LabSolutions Sync

Software Options

- Synchronizes third-party software (pretreatment or synthesis control) with LabSolutions batch operations, enabling automatic execution of LC, LC-MS, GC, and GC-MS analyses.
- Enables monitoring of instrument status via external software by synchronizing LabSolutions status and parameters with third-party systems.
- Includes an automatic shutdown capability if no acquisition is triggered within a preset time, preventing instruments from running unnecessarily.
- Supports deployment across laboratory scales, from single instrument stand-alone to large networked systems.

LabSolutions Detect

Software Options | **LabSolutions Series** | **LC Software**

- Enables alignment of chromatograms via automatic retention time correction to allow direct overlay comparison despite shifts or baseline variation.
- Automatically clusters similar peaks across datasets to detect common impurities with AI-based matching, reducing manual comparison labor.
- Generates anomaly (difference) analysis reports with one click, including overlay displays and flagged deviations, without complex parameter setup.
- Stores all difference analysis results within the LabSolutions database, ensuring integrated management with original data and maintaining data integrity.

LabSolutions GCMS

Software & Informatics | **LabSolutions Series** | **GC-MS Software**

- LabSolutions DB/CS supports GC–MS data management with regulatory compliance (e.g. electronic records & signatures, ER/ES), preventing overwriting or deletion of analysis data.
- Compatible instruments include GCMS-QP2020 NX, QP2020, QP2010 Ultra, and QP2010 SE for GCMS workflows.
- In CS (networked) mode, multiple systems' GCMS data can be reviewed from any client computer and separated between measurement and analysis tasks.
- In DB (standalone) mode, a single computer connects to the GCMS instrument for acquisition and data management without requiring network infrastructure.

SHIMADZU

Excellence in Science

Spectrometry Solutions

Spectrometry Solutions

Liquid Chromatograph-Mass Spectrometry

Triple Quadrupole LC-MS/MS

- Provides ultra-sensitive quantitative analysis for complex matrices such as food, environmental, and biological samples.
- Integrates automated MRM optimization, peak integration intelligence, and column conditioning for consistent results.
- Offers multiple ionization sources (ESI, APCI, DUIS, DPiMS) to cover a wide polarity range.
- Supports microflow operation (1–500 µL/min) using UF-Link zero dead-volume connections for optimal chromatographic performance.

Single Quadrupole LC-MS

- Delivers high-speed, high-sensitivity detection of trace components in pharmaceutical and chemical analysis.
- The LCMS-2050 combines compact design with MS performance and LC detector simplicity.
- Equipped with a dual HESI/APCI ion source to analyze compounds of varying polarity in one run.
- Achieves scan speeds up to 15,000 u/sec with 10 ms polarity switching and a mass range of m/z 2–2000.

Quadrupole Time-of-Flight LC-MS/MS

- Ensures mass accuracy within ±1 ppm even under fluctuating laboratory temperatures.
- Provides fast, stable polarity switching for simultaneous positive/negative ion detection.
- Includes automatic tuning for calibration of mass accuracy, resolution, and sensitivity.
- Supports multiple acquisition modes (MS, SIM, MS/MS, MRM, DDA, DIA) for flexible qualitative and quantitative workflows.

Spectrometry Solutions

Liquid Chromatograph-Mass Spectrometry

Automated LC-MS/MS

- The CLAM-2040 automates sample extraction, cleanup, and injection for hands-free LC-MS analysis.
- Reduces variability caused by manual handling while increasing analytical throughput.
- Seamlessly integrates sample preparation with LC-MS/MS for a continuous workflow.

LC-MS Components & Accessories

- Includes microflow autosamplers, column ovens, degassers, and solvent delivery modules.
- UF-Link interfaces minimize dead volume to maintain accurate peak shapes.
- Designed for compatibility across microflow to semi-micro flow regimes.

LC Columns

- Shim-pack MC C18 columns (1.9 µm) handle pressures up to 70 MPa for microflow LC/MS.
- Trap columns (C18/C8) enable sample concentration and matrix cleanup under high pressure.
- UF-Link ensures zero dead-volume connections between column and interface to preserve performance.

LC-MS Consumables

- Includes critical flow-path components such as plungers, seals, filters, and check valves.
- Ensures stable solvent delivery and consistent injection precision.
- Supports regular maintenance of pumps, autosamplers, and degassing units.

Spectrometry Solutions

Gas Chromatograph-Mass Spectrometry

Triple Quadrupole GC-MS/MS

- Enables ultra-trace quantitative GC-MS/MS by combining a highly efficient detector and three noise-reduction technologies to reach femtogram-level sensitivity.
- Uses off-axis ion optics, shielded detector, and overdrive lens to reduce noise and improve signal-to-noise ratio.
- Features simplified maintenance via "Active Time Management" and "Easy sTop" functions to assist in ion source, injection port, and continuous analysis scheduling.
- Supports automated method development with Smart MRM and Smart Database, reducing manual tuning of transitions and collision energies.

Single Quadrupole GC-MS

- The GCMS-QP2020 NX employs a differential exhaust turbomolecular pump plus high-performance flow controller to maintain sensitivity under varied conditions.
- Incorporates Smart SIM for simplified method creation and LabSolutions Insight software to accelerate data review.
- Offers robustness and high reliability through hardware and automated functions in routine analysis contexts.
- The GCMS-QP2050 uses a DuraEase ion source to extend uptime, plus contamination-resistant optics to reduce maintenance frequency and allows maintenance in one minute.

GC-MS Components & Accessories

- Provides sample introduction systems tailored to volatile and semi-volatile compound analysis.
- Offers series as accessory modules for enhancing GC-MS capability.
- Supports multiple ionization modes through accessory options for softer or harder ionization approaches.
- Compatible with Shimadzu's GC-MS software and database modules, integrating hardware accessory control with data acquisition and processing.

Spectrometry Solutions

Gas Chromatograph-Mass Spectrometry

Application Specific GC-MS Systems

- Tailors systems to domains such as food safety, environmental analysis, forensic toxicology, aroma analysis, and dioxin monitoring
- Uses pre-registered Smart Databases to accelerate method setup in specialized fields.
- Combines spectral libraries with application databases to support identification in target and non-target workflows.
- Enables rough quantitation without standards via databases that include calibration curves and retention index data for known analytes.

GC Columns

- Shimadzu offers GC columns optimized for volatile and semi-volatile separation, supporting use in their full GC-MS instrument line.
- Column options integrate with accessory modules to permit column switching or alternate flow paths without breaking vacuum.
- Columns are matched to sample introduction systems (HS, pyrolysis, etc.) via accessory compatibility.
- Integrated into system design so injector, oven, and interface modules maintain minimal dead volume and optimal transfer to MS.

GC-MS Consumables

- Consumables include parts such as liners, inserts, septa, filaments, ion source components, and detectors, as implied by consumable part search features on the site.
- Shimadzu lists a consumable parts search function to support ongoing maintenance and replacement in GC-MS systems.
- Consumable kits are bundled with systems to ensure users can maintain the hardware without sourcing parts separately.

Spectrometry Solutions

MALDI-Based Instruments and Solutions

MALDI Benchtop Instruments

- Examples include MALDI-8020 (linear TOF, positive ions, 200 Hz laser, load-lock chamber, automated source cleaning) and MALDI-8030 (dual-polarity linear TOF) in compact footprints.
- Designed for routine, high-throughput workflows with features such as quiet operation (< 55 dB) and fast sample introduction.
- Use of automated or software-guided maintenance (e.g. TrueClean automated source cleaning) to maintain performance over time.

MALDI Floor Standing Instruments

- The AXIMA series offers research-grade MALDI-TOF / TOF mass spectrometers suited for high-energy MS/MS and high mass intact protein analysis.
- Features include precursor ion selection gating, CID (collision induced dissociation) at laboratory-frame energies (e.g. 20 keV), and reflectron mode high resolution operation.
- Designed for flexibility across workflows: supports proteomics, LC-MALDI coupling, biomarker discovery, polymer analysis, and other high-demand use cases.

MALDI Imaging Solutions

- Shimadzu offers MALDI imaging capabilities (i.e. spatially resolved MS) integrated into their instrument portfolio (e.g. with benchtop instruments) for mapping analyte distributions.
- These imaging solutions leverage the same MALDI-TOF basis to support tissue, biomolecule localization, and sample heterogeneity studies.
- Supports software and instrument configurations optimized for imaging throughput and sample alignment.

Spectrometry Solutions

MALDI-Based Instruments and Solutions

MALDI Software Solutions

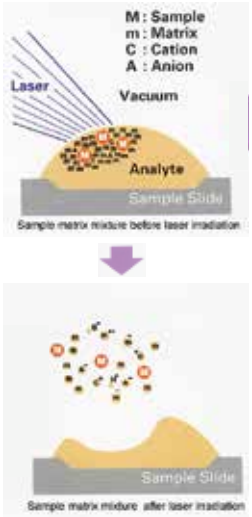
- SampleStation / AuraSolution: sample worklist creation, automated acquisition, result review, and data traceability in a centralized database (with user login, barcode scanning, and access control).
- MALDI Solutions™ software uses a Microsoft SQL database to store sample lists, acquisition parameters, and acquired data under security constraints (e.g. for regulatory compliance).
- MALDI EasyCare: guided maintenance and tuning (manual cleaning of optics, automated tuning of deflector/detectors) to restore performance, increase uptime, and reduce reliance on engineer service.

MALDI Consumables

- Consumables include sample targets (e.g. FlexiMass™ slide formats, barcoded single-use polymer slides) to support sample preparation and traceability.
- Consumables are integrated into workflows (e.g. worklist linking sample slide identifiers) to maintain the association between sample and acquired data.
- Components such as ion optics and surfaces are subject to maintenance and replacement via EasyCare processes to sustain instrument performance.

Principle of MALDI

- Samples are mixed uniformly with a matrix; the matrix absorbs UV laser energy, converting it into heat and vaporizing (desorbing) the analyte with minimal fragmentation.
- Ions generated from the desorbed analytes are accelerated by a potential difference into a time-of-flight (TOF) analyzer; ions with lower m/z travel faster, so arrival time differentiates mass/charge.



Spectrometry Solutions

Molecular Spectroscopy

UV-Vis-NIR Spectroscopy

- Measures transmittance, absorbance, or reflectance by irradiating a sample with light.
- Shimadzu's instruments span wide wavelength ranges and include multiple detectors and integrating spheres for high sensitivity in solids and films.
- Features include high scan speed, low stray light, and software support for spectral evaluation and instrument control.

FTIR Spectroscopy

- Uses broadband infrared irradiation and Fourier transformation of interferogram signals to generate absorption spectra
- Shimadzu IRTracer-100 achieves high performance: signal-to-noise ratio of 60,000:1, and rapid scanning at 20 spectra per second.

Fluorescence Spectroscopy

- It features high scanning speed, long-life xenon lamp, and extended-range PMT detector enabling measurement to ~900 nm.
- Software integration (LabSolutions RF) ensures consistent GUI across measurement, analysis, reporting; includes validation tools and sample accessory status tracking.

Raman Spectroscopy

- Shimadzu's AIRsight system combines IR and Raman in one microscope so both spectra can be acquired at the same sample position without moving the sample.
- The AIRsight supports analysis of both organic and inorganic features, uses common software for IR and Raman control, and ensures spatial alignment via shared imaging and stage referencing.

Spectrometry Solutions

Elemental Analysis

Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES / ICP-OES)

- Shimadzu's ICPE-9800 (and related models) uses a CCD detector capturing all wavelengths simultaneously, enabling measurement of both high and low concentration elements in one run.
- A vertical-torch design helps reduce sample adhesion and memory effects, improving measurement stability and washout performance.

Inductively Coupled Plasma Mass Spectrometry (ICP-MS)

- Provides ultra-trace multielement detection (ppt levels) by directly introducing ions into the mass spectrometer for high sensitivity.
- Compared to ICP-AES, offers superior sensitivity but has lower matrix tolerance and greater maintenance demands due to direct ion path.

Application Specific ICP-MS Systems

- Shimadzu offers configured ICP-MS systems optimized for environmental or regulatory applications (e.g. elemental impurity screening) to align with industry workflows.
- These systems aim to reduce operator intervention through optimized hardware and software integration, improving ease-of-use and throughput.

Inductively Coupled Plasma Mass Spectrometry Software

- Shimadzu's software integrates method development tools and supports automated evaluation of results to reduce manual steps.
- The software includes operations for quantitative methods such as calibration curve and fundamental parameter (FP) methods, especially when used in conjunction with XRF alternatives.

Spectrometry Solutions

Elemental Analysis

Atomic Absorption Spectroscopy (AAS)

- Shimadzu's AAS line offers models ranging from basic to fully automated general-purpose instruments.
- The AA-7800 includes safety features (e.g. vibration sensors, gas leak detection) and supports dual-beam optics plus autosampler/network integration.

Energy Dispersive X-ray Fluorescence Spectroscopy (ED-XRF)

- ED-XRF is non-destructive and can analyze solids, powders, and liquids without chemical pretreatment, enabling qualitative and quantitative elemental analysis.
- Shimadzu's lineup includes EDX-7200, EDX-8100, and EDX-LE models offering high sensitivity, speed, and regulatory compliance (RoHS/ELV screening).

Wavelength Dispersive X-ray Fluorescence Spectroscopy (WDXRF)

- Shimadzu positions WDXRF as part of its elemental analysis portfolio, providing high spectral resolution by dispersing x-rays by wavelength for more precise elemental separation.
- The XRF-1800 sequential WDXRF model supports mapping and film thickness evaluation, and uses a 4 kW thin-window X-ray tube to boost sensitivity for light elements.

Optical Emission Spectroscopy (OES / ICP-OES)

- Shimadzu treats OES (i.e. ICP-OES) as a core technique in its elemental analysis suite for simultaneous multi-element emission measurement.
- Using a spectrometer that splits light in two dimensions onto a CCD chip enables fast throughput and minimizes spectral interferences via increased resolution.

RAININ

Pipetting 360 +

Liquid Handling Solutions

Liquid Handling Solutions

Pipettes

Single Channel Pipettes

- Available in both manual and electronic formats with Universal-fit or LTS tip compatibility, designed for ergonomic and durable daily use.
- Deliver precise micro- to milliliter volume transfer, with optimized mechanics for smooth operation and reduced user fatigue.

Multichannel Pipettes

- Provide consistency across 8 or 12 channels, ensuring synchronized volume delivery in plate workflows
- Offered in manual, electronic, and adjustable spacer variants to adapt to varying lab format needs.

High-throughput platforms

- Instruments like the 96-channel semi-automated systems streamline 96-/384-well plate workflows with improved speed and accuracy.
- Designed to combine efficiency and ease of use for repetitive plate-based pipetting without full robotic complexity.

Repeater pipettes

- Manual versions (AutoRep) support dosing ranges from 2 µL up to 5 mL and allow multiple aliquots per aspiration cycle.
- Electronic types (NanoRep) enable precise, repeat non-contact dispensing down to sub-microliter volumes.

Electronic multichannel adjustable spacer pipettes

- The E4 XLS Adjustable Spacer models support three volume ranges (5-50 µL, 20-300 µL, 100-1200 µL).
- They allow continuous nozzle spacing adjustment to transition between tubes and plate formats efficiently.

Liquid Handling Solutions

Pipette Tips

- Pipette tips are disposable, form-fitting polypropylene tips used to ensure accurate and consistent micro-volume transfers in research workflows.
- They are autoclavable and chemically stable, preserving integrity in diverse solvent and buffer environments.
- Filtered tips are certified free of RNase, DNase, DNA, and pyrogens, and sterilized post packaging to prevent contamination.
- Low-retention tips incorporate superhydrophobic surfaces to reduce sample adherence and improve recovery of viscous or low surface tension liquids.
- Wide-orifice tips minimize shear stress and reduce flow resistance when handling delicate or viscous samples.
- Extended-length tips are designed to reach into deep, narrow vessels, enabling access in tall or narrow labware.
- Large-volume tips (10 mL – 20 mL) with macro FinePoint geometry provide accurate dispensing of bulk liquids.
- Positive displacement syringe or capillary tips suit viscous, volatile, or high-density liquids by eliminating air gap effects.
- ShaftGard 10 µL tips wrap the pipette's ejector and shaft to guard against cross-contamination in critical applications.
- Rainin tips undergo continuous quality control testing to meet rigorous cleanliness and physical specification standards.

Liquid Handling Solutions

Semi-Automated Pipetting Systems

- The high-throughput platform line comprises semi-automated 96-channel pipetting systems tailored for 96- and 384-well workflows.
- The BenchSmart 96 system supports three quick-change pipetting heads covering volumes from 0.5 µL to 1 mL.
- The MicroPro 96-channel system features "Pipetting Depth Recall" to maintain consistent tip immersion levels across wells.
- BenchSmart's interface offers touchscreen control of aspiration, dispensing, tip loading, and ejection.
- BenchSmart supports multiple pipetting modes including basic, dilute, multi-dispense, reverse, volume sequencing, mixing, and cycle count.
- Its four-plate layout is designed to minimize tip or reservoir swaps, streamlining multi-step protocols.
- The BenchSmart software allows user accounts, password protection, mode presets, and protocol memory for reproducible workflows.
- MicroPro is among the smallest 96-channel pipettors on the market, optimizing use of bench or biosafety cabinet space.
- MicroPro's precision specs include a volume range of 2–20 µL, with accuracy and precision designed to stay within low percentage error tolerances.
- Pipette tips designed for these systems use Rainin BioClean LTS technology, compatible with semi-automated pipetting performance requirements.

Liquid Handling Solutions

Pipette Management

- Pipette Management includes SmartCheck™, a tool that verifies pipette performance in less than 60 seconds.
- SmartCheck measures dispensed volume with three repeats and provides a pass/fail result against pipette tolerances.
- It works with any pipette brand dispensing between 10 µL and 1,000 µL, including individual channels of multichannel pipettes.
- PipetteX™ software automates pipette tracking, usage monitoring, and data collection for asset management.
- PipetteX is brand-agnostic, supporting pipettes from different manufacturers.
- SmartStand serves as a docking and charging station, keeping pipettes organized and ready.
- The system ensures audit readiness by maintaining detailed logs of usage, verification, and calibration.
- Regular SmartCheck use helps identify out-of-tolerance pipettes before critical experiments.
- PipetteX allows scheduling of service, calibration, and maintenance across large pipette fleets.
- Together, SmartCheck, PipetteX, and SmartStand provide a complete life-cycle management solution for pipettes.

FEDEGARI AUTOKLAVEN AG

Microbiology Lab Solutions

Microbiology Lab Solutions

Sterilizers and Washers

FVG – VERTICAL LAB STERILIZER

- Equipped with an integrated steam generator and automatic water feed pump, enabling the sterilization under saturated-steam conditions.
- Features chamber volumes of 50 L (FVG1), 75 L (FVG2) and 140 L (FVG3), with chamber and lid constructed of 316L stainless steel with mirror-polished sanitary finish, operating up to 3.5 bar g pressure and 140 °C temperature.
- Includes a horizontal swivelling lid with pneumatic "rotate-and-seal" gasket, a heat-recovery system, and a TSC 09 microprocessor controller.

FVA/A1 – VERTICAL LAB STERILIZER

- Designed for demanding applications (food, bio-pharma, cosmetics, microbiology, packaging) with chamber capacities of 75 L, 140 L and 188 L, built with 316L stainless steel chamber and lid.
- Features an automatic vertical sterilizer configuration with modular construction, a patented pneumatic seal for the horizontal swivelling lid.
- Employs the DCS20 process controller allowing full programmability (30 customizable cycles), Ethernet interface for remote monitoring, user-friendly display positioning.

FOB – BENCHTOP LAB STERILIZER

- Benchtop series offering four chamber dimension options: 47 L (FOB2-TS single door), 75 L (FOB2S-TS double door), 90 L (FOB3-TS single door), 122 L (FOB3S-TS double door), enabling flexibility for lab environments.
- Construction uses 316L stainless steel for chamber, pneumatic valves and hydraulic components with electropolished finish; features patented pneumatic gasket for door seal and optional safety device to prevent door opening under unsafe conditions.

Microbiology Lab Solutions

Sterilizers and Washers

FOB4 – STAND-ALONE LAB STERILIZER

- Offers larger capacity stand-alone configuration with chamber volumes of 147 L (FOB4-TS single vertical sliding door), 210 L (FOB4S-TS), and 226 L (FOB4L) with double vertical sliding door for pass-through applications.
- Internal 316L stainless steel plates serve as a heat-exchanger system for steam pre-heating and chamber cooling (via cold softened water).
- Built-in safety features such as a thermal blocking system to prevent door opening under hazardous conditions, and control via a DCS 20 process controller supporting 30 customizable cycles in a multi-user environment.

FOB5 – STAND-ALONE LAB STERILIZER

- Designed for large-volume sterilization, with chamber volumes from 362 L up to 729 L (various configurations) and single or double vertical sliding doors.
- Features two high–efficiency internal 316L stainless steel plates functioning as a heat-exchanger system for steam pre-heating and chamber cooling.
- Equipped with the Thema4Lab process controller (GAMP5-compliant), vertical positioning of filters to avoid frequent rupture, and full accessibility to technical area from front/lateral.

FGW – LAB GLASSWARE WASHER

- Uses a dedicated steam generator to enhance washing performance of greasy or sticky soils; steam penetrates hard-to-reach areas and reduces detergent and water consumption per cycle.
- Equipped with a conductivity meter on the drain line to monitor water purity and terminate the process automatically when the set-point is reached, minimizing utility consumption.

BINDER

Microbiology Lab Solutions

Microbiology Lab Solutions

Incubation and Plant Growth

CO2 incubators

- Temperature range: from ambient +4 °C (or +6 °C) up to +50 °C; humidity up to ~90-95 % RH; CO_2 control range 0–20 vol. % with IR sensor technology.
- Features hot-air sterilisation up to +180 °C, seamless stainless-steel deep-drawn inner chamber, double-pan humidification with condensation-protection, and USB/ethernet data logging.

Cooling incubators

- Temperature range: from +4 °C (or 0 °C) up to +100 °C (or higher) using compressor or Peltier cooling; APT.line™ pre-heating chamber technology ensures uniformity (e.g., 0.3 K at 37 °C).
- Additional features: adjustable fan speed, inner door made of safety-glass, class 3.1 independent temperature safety device (DIN 12880) with visual/ acoustic alarm, USB data interface.

Standard incubators

- Temperature range from ambient +5 °C up to +100 °C (or specific models +30 °C to +70 °C) with convection type options.
- Convection and control features: adjustable exhaust-air flap, controller with timer functions, inner door of tempered safety glass, class 3.1 independent temperature safety device per DIN 12880.

Drying and heating chambers

- Situated in gravity convection or forced convection configurations (Series ED, FD, FED etc.), offering temperature ranges from ambient +5 °C (or +7 °C above) up to +250–300 °C, with homogeneous temperature distribution via APT.line™.
- Equipped with USB or Ethernet connectivity for data logging, intuitive controllers (LCD display) and energy-efficient design.

Microbiology Lab Solutions

ULT STORAGE

Ultra-low temperature freezers

- Temperature range: –90 °C to –40 °C, enabled via a powerful cascade compressor cooling unit and climate-neutral refrigerants R-290 and R-170.
- Thermal insulation uses long-life vacuum insulation panels (VIPs), and interior components (chamber, shelves, inner doors) are made entirely of stainless steel, rust-proof and durable.
- Energy efficiency: energy consumption at set-point –80 °C and ambient temperature ~21 °C is approx. 7.9 kWh/day for the UF V 500 model; sound pressure level ~47 dB(A) at normal operation.
- Safety and monitoring features include zero-voltage alarm contact for external alarm systems, Ethernet interface and USB data-logger for exporting measured values in open format; two Ø 28 mm access ports at rear.
- Mechanical design: ergonomic door handle, innovative door gasket concept to reduce ice build-up, optionally water-cooled versions available, and permitted load per compartment about 50 kg (110 lbs) with standard three stainless-steel shelves (max up to 13).

INTEGRA

Microbiology Lab Solutions

Microbiology Lab Solutions

Media Preparation and Filling

MEDIACLAVE 10/3 (Media sterilizer) and MEDIAJET (Petri dish filler)

- The MEDIACLAVE range covers two capacities: the "10" model supports 1–10 L medium volume, and the "30" model supports 3–30 L volume.
- In the MEDIACLAVE, a magnetic stirrer offers selectable speeds of 50–200 rpm and reversible rotation direction to ensure homogeneous mixing across a wide viscosity range.
- The MEDIACLAVE supports sterilization temperature range from 30 °C up to 122 °C with dispensing temperature down to ~20 °C, and a typical full cycle (for 15 min sterilisation) takes ~65–75 minutes depending on model.
- For the MEDIAJET Petri-dish filler: dosing range per dish is 1.0 mL to 99.9 mL; dosing reproducibility approx. 1 % (at 15 mL); maximum dosing rate 500 mL/min.
- The MEDIAJET supports a standard filling rate of about 900 dishes per hour (up to 15 mL) and a turbo mode reaching ~1,100 dishes per hour (up to 24 mL).
- MEDIAJET accommodates Petri-dish diameters Ø 90 mm (standard) and the "vario" version supports Ø 90, Ø 60 and Ø 35 mm dishes; the carousel capacities are 360 or 540 dishes depending on model.
- The MEDIACLAVE provides process documentation and validation: it records digital log files with electronic signatures (21 CFR Part 11 / EU GMP Annex 11), and features USB or printer output for archiving.
- The MEDIAJET features a UV-C lamp (≈ 2.1 W at 253.7 nm) spanning the filling rotor for enhanced bactericidal activity and clean environment.

Microbiology Lab Solutions

Aspiration Systems

VACUSAFE (Safe-Aspiration System)

- Combines an integrated vacuum pump, collection bottle, overflow protection and hydrophobic filters (0.45 µm or 0.2 µm) into one closed aspiration system.
- Vacuum regulation knob and built-in level sensor detect when the collection bottle is full, automatically shut off the pump and alarm.
- Compatible for use in BSL-1 to BSL-3 laboratories, with self-closing connectors, shatter-proof bottle, low noise (< 50 dB(A)).

VACUSIP (Portable Aspiration System)

- A compact, bench-top aspiration system with an integrated silent vacuum pump, capable of operating without an external vacuum source.
- Achieves vacuum of –250 mbar ±20%, liquid flow of 2.3 mL/s (with 40 mm stainless steel tip), noise emission < 50 dB(A) at 1 m, and supports seating on any bench.
- Equipped with hydrophobic filter for aerosol protection, all liquid-contacting parts are autoclavable, and hand-operator includes pressure-sensitive flow regulation.

VACUBOY (Vacuum Hand Operator)

- Hand-held vacuum aspiration tool that connects to any vacuum source via silicone tubing and accepts a wide range of adapters (constituent multi-channel adapters, Pasteur pipette adapters, disposable tip ejectors).
- Ergonomic touch-sensitive button on the hand operator allows precise vacuum regulation and smooth control of liquid aspiration; equipped with anti-drip system.
- All adapters and hand operator components are autoclavable and designed for safe use with bio-hazardous liquids; system supports integration with the VACUSAFE collection system.

Microbiology Lab Solutions

Microplate Dispenser

WELLJET Reagent Dispenser

- Volume dispensing range spans 0.5 µL to 9,999 µL, enabling a wide spectrum from very small to moderate-volume reagent aliquoting.
- Compatible with multiple micro-plate formats: 6, 12, 24, 48, 96, 384 and 1536 wells (both shallow and deep versions); supports plate heights of 5–64 mm (manual mode) and 9–25 mm (stacker mode).
- Physical and electrical specs: Dimensions for dispenser unit are 20 × 46 × 29 cm (W×D×H), weight approximately 8.8 kg, mains input 100-240 VAC, 50/60 Hz, power consumption ~100 W, noise emission <60 dBA.
- User interface and integration: High-resolution 17.8 cm (7) touchscreen, Ethernet interface with API commands available, optical sensor detection method, and non-contact dispensing technology.

Peristaltic Pump

DOSE IT Peristaltic Pump

- Dose volume and flow rate: Capable of dispensing from 0.1 mL up to 9,999 mL, with flow rate range approximately 0.6 mL/min up to 5 L/min, depending on tubing diameter.
- Tubing compatibility: Accepts silicone tubing with an inner diameter range from 1 mm to 8 mm, enabling broad flexibility in volume, speed and application.
- Physical and interface specifications: Dimensions ~203 × 210 × 191 mm (H×W×D), weight ~3.5 kg, interface includes 2× RS-232 ports, input voltage 100-240 VAC, 50/60 Hz.
- Pump head and precision features: Flip-top pump head for quick tubing exchange; with 1 mm tubing, dose volumes >0.5 mL at CV <1% and flow rates ~0.6–52 mL/min; 6 mm tubing can achieve >15 mL dose volumes with flow rates ~16–1634 mL/min.

Microbiology Testing

Microbiology Testing

Sample Preparation

Sample Preparation

- Achieves ±0.1 g weighing accuracy, supported by an integrated high-performance balance and dual-pump system for consistent flow control.
- Delivers fast processing with dilution speeds of up to 500 mL/min, ideal for high-throughput microbiology and food testing workflows.

Innoculation

- Delivers high reproducibility with an electronically regulated pump system that ensures exact deposition of 50–1000 µL sample volumes across the plate.
- Achieves accurate CFU enumeration with its three plating modes (Constant, Exponential, and Independent), optimized for food, cosmetic, clinical, and environmental microbiology labs.

Colony Counting & Zone Reading

- Equipped with a high-resolution 5-megapixel camera and full-spectrum LED dome illumination, eliminating shadows and ensuring uniform imaging across all media types.
- Utilizes advanced AI-driven image analysis capable of detecting colonies as small as 0.05 mm, with automatic differentiation of colors, shapes, and densities for accurate CFU counting.

Slide Stainning

- Processes up to 20 slides per run across 10 reagent stations + 1 drying station, enabling fully programmable staining workflows.
- Uses a robotic arm with precise XYZ motion to ensure consistent immersion time and reproducible staining across histology, cytology, and microbiology protocols.
- Built with sealed reagent tanks (300 mL each) and a controlled agitation system, reducing cross-contamination while maintaining homogeneous staining quality.

Testing Instruments

Testing Instruments

Cap Testing

Cap Torque Test

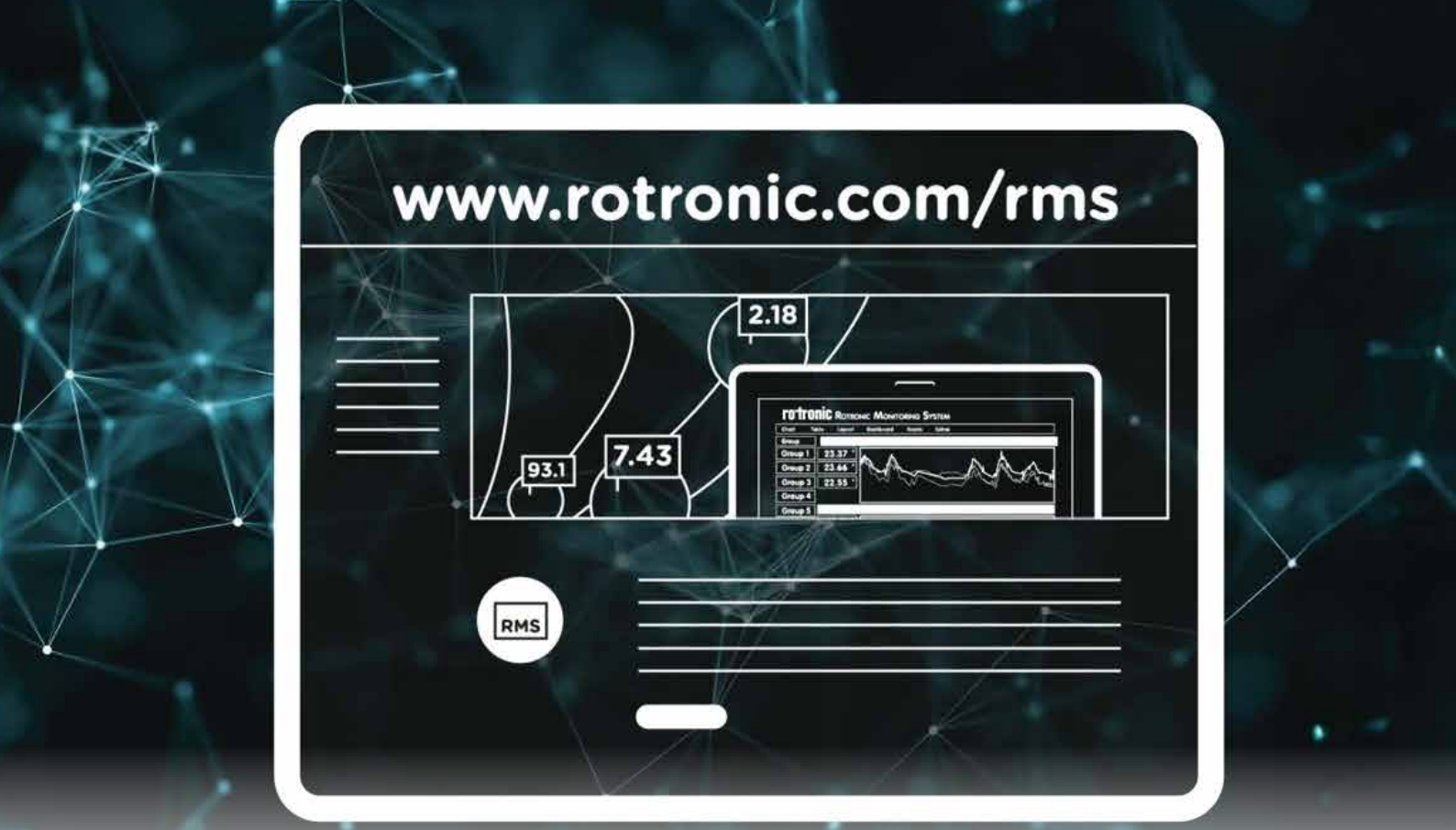
- Offers a full range of closure torque testing solutions—from manual handheld units to fully automatic torque testers designed for child-resistant and standard closures.
- Automatic models (e.g., ST-LAB6/7) include features such as programmable top-load force control, release torque testing without breaking seal integrity, and application angle measurement.
- Desktop and wireless models support quick-lock platforms, Bluetooth connectivity to smartphones/tablets, and mobile HMI displays for dose/torque measurement.

Capping Machine Test

- Supports dynamic in-line testing of capper machines including closure torque, capper chuck torque, top-load force testing and spring-load evaluation on crown corks, ROPP and crimp capping machines.
- Smart Bottle modules (e.g., SB-T, SB-F, SB-TF) permit wireless monitoring of torque/time and force/time on running production lines without stopping the capping machine.
- Interchangeable neck thread fitments and dummy bottles for accommodating different container sizes/shapes enable flexible integration into various capping lines.

Smart Load Cells

- Wireless Bluetooth load-cell systems that convert a smartphone (Android or iOS) into a display/interface for measuring a wide range of tensions/compressions.
- Available in capacity ranges from 100 kg up to 10 tons for S-beam models, and supports specialized testers.
- Data acquisition features include measuring modes (single/double peak, continuous), wireless data transfer, graphing (torque/force vs time), high-frequency sampling, and on-device storage prior to PC export.



rotronic

MEASUREMENT SOLUTIONS

A PST BRAND

Operational Environment Monitoring Systems

Operational Environment Monitoring Systems

Monitoring and Measurements

Humidity Monitoring

- Measures relative humidity with high accuracy and fast response time.
- Enables calculation of dew/frost point and other psychrometric parameters.
- Offers analog (4–20 mA) and digital (RS-485) outputs for control systems.

Temperature Monitoring

- Uses Pt100 sensors in 3- or 4-wire configuration for precision.
- Suitable for production, storage, and transport monitoring.
- Supports continuous digital logging and calibration.

CO2 Monitoring

- Measures CO_2 alongside temperature and humidity.
- Designed for real-time monitoring under regulated conditions.
- Integrates into modular monitoring systems for IAQ and incubators.

Differential pressure Monitoring

- Uses thermal mass-flow or diaphragm sensors for high sensitivity.
- Accuracy ±1 % FS; response time < 1 s.
- Ideal for cleanrooms and critical environments.

Operational Environment Monitoring Systems

Monitoring and Measurements

Pressure Monitoring

- Integrates process-pressure sensors into RMS.
- Supports analog (4–20 mA, 0–10 V) and digital (Modbus, OPC UA) outputs.
- Enables centralised pressure monitoring and control.

Water Activity Monitoring

- Measures free water (aw = 0...1) using HygroClip sensors.
- Fast reading time (≈ 5 min) with temperature stability.
- Indicates product stability and microbial growth risk.

Dew Point Monitoring

- Calculated from humidity and temperature.
- Indicates saturation temperature of air or gas.
- Essential for preventing condensation and corrosion.

O2 Monitoring

- Uses MSRS technology for trace oxygen measurement.
- No reference air needed; barometric compensation included.
- Provides analog and RS485 Modbus outputs.

HygroGen2 - HG2-S - Humidity Generator

- The unit generates a highly stable reference environment with a standard range of 5 to 95 %RH and 0 to 60 °C.
- It features a 2-liter chamber that can calibrate up to five (or six with certain configurations) probes simultaneously and includes integrated software (HW4/HW5) (FDA 21 CFR Part 11 compliant)

Operational Environment Monitoring Systems

Rotronic Monitoring System (RMS)

- The RMS is modular hardware plus web-based software: data loggers record values from both Rotronic and third-party sensors and send to a secure database accessible via PC, Mac, tablet or smartphone.
- Supports multiple deployment modes: on-premise installation, public cloud (SaaS) and exclusive cloud versions with validated environments for regulated use.
- Designed for regulatory environments: compliant with GAMP5 (software category 4, hardware category 1), supports FDA 21 CFR Part 11, EU Annex 11 and EU Annex 15 requirements.
- Provides integration of third-party devices via analog input, MODBUS TCP, JSON API and can export data via CSV, PDF, OPC UA and MS SQL.
- Offers real-time notifications: alarms and alerts can be sent via e-mail, SMS, telephone calls; user configurable for warning vs alarm, delay, hysteresis.
- Built-in audit trail and full data integrity: system logs actions, changes, hardware replacements, calibration data; read/write access only, no delete rights in cloud-hosted mode.
- Scalable from single measurement point installations up to systems with several thousand measurement points across multiple locations.
- Supports measurement of many parameters: temperature, relative humidity, carbon dioxide, oxygen, differential pressure, analog voltages/currents and digital inputs.
- Data loggers available with PoE, 24 V supply and backup battery; wireless versions also offered to reduce cabling and risk of data loss.
- Automated and customizable reporting: functionality includes batch-release reports, deviation reports, calibration/validation reports and mapping reports (e.g., DIN 12880, NF X 15-140, USP 1079, WHO Supplement 8).

BMS and EMS	**Environmental Storage**	**Pharmacy & Drugstore**
Warehouse Monitoring	**Incubators Monitoring**	**Cold Chains Temperature**
Food and Tobacco	**Cleanrooms**	**Cold Storage Temperature**
Data Center Monitoring	**Compressed Air Systems**	**IVF Labs**

BINDER

Operational Environment Control Systems

Operational Environment Control Systems

Standard incubation and Plant Growth

Cooling incubators

- Temperature range: from +4 °C (or 0 °C) up to +100 °C (or higher) using compressor or Peltier cooling; APT.line™ pre-heating chamber technology ensures uniformity (e.g., 0.3 K at 37 °C).
- Additional features: adjustable fan speed, inner door made of safety-glass, class 3.1 independent temperature safety device (DIN 12880) with visual/ acoustic alarm, USB data interface.

Standard incubators

- Temperature range from ambient +5 °C up to +100 °C (or specific models +30 °C to +70 °C) with convection type options.
- Convection and control features: adjustable exhaust-air flap, controller with timer functions, inner door of tempered safety glass, class 3.1 independent temperature safety device per DIN 12880.

Growth chambers

- Provide defined climate conditions with temperature and humidity control plus LED lighting modules for plant growth; e.g., temperature range 10 °C to 50 °C (KBF series) or up to +50 °C with humidity 10-90 % RH (KBF PRO series).
- Modular design: basic units (climate chambers) can be retrofitted with LED plant-light modules (16 strip-lights, warm/cool white + dark red phytochrome channel) and optional CO_2 gassing (0.05–1 vol. % CO_2).

Operational Environment Control Systems

Drying and Tempering

Safety drying chambers

- Safety concept meets the DIN EN 1539 standard, with replaceable fresh-air cartridges and symmetrical airflow to handle solvent-containing specimens.
- Temperature range from ambient +10 °C (or +10 °C above ambient) up to approx. +300 °C, with APT.line™ pre-heating chamber technology.
- Silicone- and dust-free stainless-steel inner chamber, 60 mm insulation thickness, 2-point door closure, and defined ventilation exhaust.

Drying and heating chambers

- Situated in gravity convection or forced convection configurations (Series ED, FD, FED etc.), offering temperature ranges from ambient +5 °C (or +7 °C above) up to +250–300 °C, with homogeneous temperature distribution via APT.line™.
- Equipped with USB or Ethernet connectivity for data logging, intuitive controllers (LCD display) and energy-efficient design.
- Adjustable exhaust air flap (in many models), class 2 independent adjustable temperature safety device (per DIN 12880).

Vacuum drying chambers

- Designed for gentle, residue-free drying of materials with solvents (non-flammable: Series VD; flammable: Series VDL with explosion-proof interior), with temperature range from approx. ambient +9 °C up to +220 °C.
- Features include digital display and control of both pressure and temperature, program-controlled drying monitoring with automatic ventilation at end of process, and internal data logger for open-format export (USB/Ethernet).
- Excellent heat transfer via large thermal conducting plates and patented expansion racks, stainless-steel interior.

Operational Environment Control Systems

Environmental Simulation

Constant climate chambers

- Temperature range 0 °C to +70 °C and humidity range 10 % to 80 % RH for the standard KBF series; expanded models (KBF PRO) achieve -20 °C to +100 °C and 10 % to 98 % RH.
- Use of inverter-compressor cooling with climate-neutral refrigerant (R-600a) and APT.line™ pre-heating chamber technology.
- Features stainless steel interiors with telescopic racks, adjustable fan speeds, door-heating to prevent condensation, and optional light modules.

Dynamic climate chambers

- Designed for rapid temperature changes with temperature ranges from -40 °C to +180 °C, and in extended low-temperature models down to -70 °C.
- Equipped with intuitive touchscreen controllers supporting time-segment programming, real-temperature programming, heated viewing windows, and LED interior lighting.
- Cooling technology uses climate-neutral refrigerants (e.g., R-744) and models support external relay contacts, integrated water-tank for humidity models, and programmable condensation protection.

Walk-in-chambers

- Available in three sizes with interior volumes of 12 m^3 (WIC1), 18 m^3 (WIC2) and 24 m^3 (WIC3); temperature range 10 °C to 50 °C, humidity range 20 % to 90 % RH, temperature accuracy ±1.5 °C, humidity accuracy ±2.5 % RH.
- The climate-generating unit is installed outside the chamber body to minimise disruption to interior conditions during service and maintenance.
- Floor-mounted chamber has lockable door with LED illumination and motion sensor, stainless-steel interior and optional accessories like heavy-duty shelving up to 11 levels, additional access ports and strip curtains.

Operational Environment Control Systems

ULT STORAGE

Ultra-low temperature freezers

- Temperature range: –90 °C to –40 °C, enabled via a powerful cascade compressor cooling unit and climate-neutral refrigerants R-290 and R-170.
- Thermal insulation uses long-life vacuum insulation panels (VIPs), and interior components (chamber, shelves, inner doors) are made entirely of stainless steel, rust-proof and durable.
- Energy efficiency: energy consumption at set-point –80 °C and ambient temperature ~21 °C is approx. 7.9 kWh/day for the UF V 500 model; sound pressure level ~47 dB(A) at normal operation.
- Safety and monitoring features include zero-voltage alarm contact for external alarm systems, Ethernet interface and USB data-logger for exporting measured values in open format; two Ø 28 mm access ports at rear.
- Mechanical design: ergonomic door handle, innovative door gasket concept to reduce ice build-up, optionally water-cooled versions available, and permitted load per compartment about 50 kg (110 lbs) with standard three stainless-steel shelves (max up to 13).

KAYE
SUBSIDIARY OF AMPHENOL

Operational Environment Validation Systems

Operational Environment Validation Systems

Thermal Validation Systems

Wired Validation Systems

- Multi-channel wired system (up to 48 inputs) for high-precision thermal validation.
- Supports multiple thermocouple types with scan speeds of 48 channels/sec.
- Includes a dedicated console with integrated validation software and data management.

Wireless (RF) ValProbe RT System

- Real-time wireless data logging via 2.4 GHz RF link between loggers and base station.
- Measures temperature from –85 °C to +140 °C with sampling from 1 s upward.
- Provides live monitoring, validation software integration, and 21 CFR Part 11 compliance.

ValProbe Data Loggers Standard

- Stand-alone wireless loggers for temperature, humidity, and pressure mapping.
- Sampling interval from 1 s to 12 h with up to 10,000 data points per sensor.
- Designed for ovens, freeze-dryers, and stability chambers in regulated environments.

Real-Time Wireless

- RF loggers stream data live to a base station for continuous validation monitoring.
- Operates across –85 °C to +140 °C and 0–5 bar with robust dual-antenna communication.
- Ethernet connectivity and audit-trail software ensure data integrity and regulatory compliance.

Operational Environment Validation Systems

Thermal Calibration Systems

Kaye LTR/HTR Drywells

- Cover temperature ranges from –90 °C to +420 °C depending on model.
- Stability ±0.01 °C and uniformity ±0.1 °C for precise calibration.
- Support up to 48 thermocouples and operate in dry-block or liquid-bath mode.

Kaye CTR Liquid Baths

- Temperature range –25 °C to +140 °C with 0.01 °C stability and 0.02 °C uniformity.
- 2.5 L tank for up to 10 probes simultaneously.
- Uses compact Peltier cooling, stainless housing, and universal power input.

Kaye IRTD Temperature Standard

- Range –196 °C to +420 °C with ±0.025 °C accuracy and 0.001 °C resolution.
- 200 Ω platinum RTD in Inconel 600 sheath, 101 mm immersion depth.
- Traceable to NIST/PTB and integrates with Kaye validation systems.

Kaye Humidity Calibrator

- Generates 5–95 % RH for up to 8 probes simultaneously.
- Compact (≈3.2 kg) unit with USB data download and touch control.
- Uses dual flow-mixing for fast and stable humidity setpoints.

Scharlab
THE LAB SOURCING GROUP

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Chemicals & Consumables

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