



**sartorius**  
mechatronics

## Performance Products and Services for the Food Industry



turning science **into solutions**

# Sartorius Profile

From incoming to outgoing goods: Our solutions for your process. Production processes may be similar; however, no two installations are ever the same. That is why we not only offer an extremely wide range of products and services but, by way of individual consultation, we also develop solutions that are precisely custom-designed for the specific application.

Process optimization is one of the main driving forces for innovation at Sartorius, whereby our experience-based knowledge of our customers' processes, above all, is of great assistance in addition to our high level of technological expertise.

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## HACCP

Adopted as regulations by the U.S. Food and Drug Administration and as a European Directive, HACCP (Hazard Analysis and Critical Control Points) guidelines are food safety principles for preventing production errors that may potentially cause products to become inedible. Critical control points for this program are defined using the Codex Alimentarius. Who, when, how and how often controls are also defined here.

Sartorius technology for detecting metal and foreign objects can be used to ideally monitor the critical control point.



## IFS

The recently released version 5 of the International Food Standard represents a standardized assessment system for auditing all food producers that supply to the retail trade. Important content includes regular monitoring of critical control points, assuring batch traceability and guaranteeing the function of the measuring instruments by means of preventive maintenance.

Sartorius offers you a comprehensive range of systems for formulation weighing and quality assurance with batch traceability. In addition, Sartorius Service offers qualified maintenance services right through to tailor-made maintenance contracts.



## EHEDG

Since 1989 the European Hygienic Equipment Design Group has been concerned with developing guidelines for designing machinery and equipment that is suitable for cleaning (aseptic design) for use in food manufacturing processes.

Our special terminals, weighing platforms, metal detectors, checkweighers and weigh cells were consistently developed with these guidelines in mind. They therefore allow high durability at low operating cost under even the harshest conditions.



## IP

IP (Ingress Protection) is an important element of the cleaning-friendly design of our solutions. We offer solutions to IP65, 67 and 68 through to IP69K (high pressure resistance).



## Ex Protection

Explosive gases and dusts can also be generated in the food industry, for example, during the transportation and storage of corn, sugar or milk powder. Sartorius has weighing products that can be used in the various hazardous areas at every stage of your process. Our products are not only approved in accordance with current standards but also carry numerous regional approvals such as FM and NEPSI etc.

A close-up photograph of a silver, cylindrical laboratory flask or beaker. The flask is positioned in the lower-left foreground, with its top edge visible. The background is a dynamic splash of clear water against a deep blue background. The water is captured in mid-air, creating a sense of motion and freshness. The lighting is dramatic, highlighting the metallic texture of the flask and the individual droplets of the water splash.

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# 1 Incoming Goods

## Recording of Weight Measurements | Completeness Control

When receiving raw materials it is important to record the delivered quantities to ensure that only the quantities actually supplied are accounted for. For this purpose, desktop and floor scales are available in a variety of designs and shapes and meet the requirements for hygienic design in respect of easy cleanability. The large range of platforms made of different materials and with a variety of surface finishes offers the right solution for every application. In addition, a wide array of indicators is available for installation in diverse areas, ranging from easy, convenient recording of weight measurements through to PC-based versions with network connection.

## Parts Counting

Incoming goods in the form of packing containers and materials and other countable goods must be controlled as "piece" units in order to be able to correctly manage production inventory. The Sartorius range of counting scales for this application provides the highest resolution and counting accuracy for fast and precise counting results for all incoming countable "piece" units – and with the easiest possible operation.

## Detection of Foreign Objects

It is essential for raw materials which are to be processed to be checked for metallic contamination and where appropriate segregated or rejected in order to prevent later product contamination and to protect cost-intensive machinery and equipment from damage during processing. Both packed and unpacked products/materials (bulk materials) are checked and, in doing so, optimum results are achieved using multi-frequency technology – even in the case of changing product effects (moisture, temperature etc.). The metal detection devices are equipped with different electronics and have an extremely wide selection of metal detection coils in a variety of shapes and sizes. They meet the standards for hygienic design and as such are easy to clean while being very simple to operate with easy product changeover.

## Measurement of the pH

Raw materials can be classified for subsequent processing by measuring their pH. In meat and milk products, the pH is an important factor with regard to the freshness of the raw product. Sartorius standard pH meters are outstanding due to their reliability and ruggedness, and their easy operation means that your personnel can get along with the equipment without expensive training.

## Moisture Analysis

The moisture content of natural products varies greatly. Knowing the moisture content is of great importance in order to be able to guarantee consistent product quality. Sartorius offers a wide variety of measurement procedures for this application: weighing instruments with differential weighing function to optimize the oven drying method, infrared-drying as a fast gravimetric procedure in the minute range and microwave measurement technology for measurement in seconds with no sample preparation for online and at-line use in the production process.

## Conductivity Measurement

The conductivity of liquids is an important quality factor in relation to inorganic impurities. Sartorius measuring instruments allow highly accurate determination of conductivity. At the same time, we offer four different conductivity measurement cells to give you the optimum choice of the right cell for each application. The plain text menu in four languages provides operator guidance that is both easy to understand and comprehensive.

## Data Acquisition

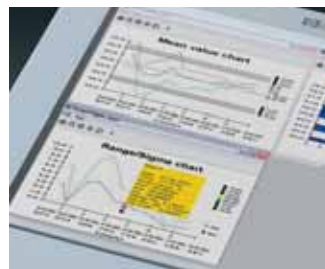
Especially in the food industry, material and batch identification of incoming goods must be recorded in order to guarantee complete traceability of all raw materials used. To this end, all supplier data is entered and linked to the individual material and batch identification and the supply quantity is registered. A variety of data acquisition programs, input devices and weighing instruments with suitable interfaces and comprehensive application solutions allow individual, customer-specific solutions. Batch-related recording of incoming goods and their quality data is also possible.



Recording weight measurements with the Combiics series



Detection of foreign objects with MDP



Data acquisition with Sartorius ProControl for Windows



pH measurements using the Sartorius Professional Meter

## 2 Raw Material Stocks

### Preparation for Production

In order for later processing to run smoothly, fast, uncomplicated extraction weighing is needed for the preparation of the required raw materials. This is guaranteed by easy integration of the weighing instruments into ERP | MES systems while at the same time complying with hygienic design standards to achieve easy cleanability.

### Inventory of Stored Raw Materials

While taking inventory, it is necessary to record the type and volume (often the weight) of stocks and reconcile these with a company's computer system. This is also guaranteed by the ease with which our weighing instruments can be integrated into ERP | MES systems while maintaining industry standard communications.

### Online Moisture Analysis

The constant analysis of moisture content is essential for optimum, efficient process control for many products. In the case of drying processes, energy costs can be reduced to a minimum and important chemical and physical properties can be permanently standardized as a result.

By using microwave resonance technology and special sensors the moisture content can be measured and evaluated online in seconds during the process. The controls for achieving the optimum target moisture content of the product can thus be fully automated.

### Measurement of the pH

In order to increase product quality, pre-selection of the areas where certain raw materials can be used is defined by determining the pH-value. Raw materials can also be segregated in case of doubt. Automatic calibration at the touch of a button allows fast preparation for measurement. Low maintenance gel electrodes reduce the failure rate and simplify handling of the device.

### Data Acquisition

To prepare raw materials in contract-related batch sizes, advance allocation and labeling with corresponding batch identification are required. Efficient data logging and a flexible interface to the database connection on host systems are also required for any kind of filling activity and for stocktaking. Furthermore, approval to release goods from quarantine storage following successful quality inspection is absolutely essential in the case of easily perishable raw materials. Sartorius offers a large selection of hardware and software for the realization of these tasks and an optimum solution for your requirements combined with functionality and easy, safe operation.





Moisture analysis with the MA150



For connecting weighing components over the Ethernet:  
Process Indicator X3 and Process Transmitter PR5220



Tank and vessel weighing



# Production

## Batch Processing | Formulation | Filling

### Automatic Batching | Mixing

For exact quality and to avoid faulty batches it is important to automatically dose and mix raw materials in the correct proportions precisely and quickly in accordance with a recipe. Highly accurate weigh cells, transmitters and controllers are available for the instrumentation of process containers in automatic batching processes. These can be used as stand-alone weighing terminals or connected to controllers over field buses. For easy process monitoring and control and uncomplicated data storage, batch management systems based on standards and regulations (HACCP and IFS) complete the individual solution.

### Manual Batching | Mixing

For exact, reproducible quality of taste in the food industry, it is often necessary to manually batch mixed herbs and spices or flavor concentrates in accordance with a recipe. For this purpose, not only are highly accurate platform scales required for very small batches but also manual recipe systems which due to their intuitive operator guidance achieve a high degree of product safety. The batching and mixing process can be optimized with the aid of various setpoint recalculations. Reports are produced on all batching processes and any process which deviates from the recipe is recorded in the audit trail. Thus these manual recipe systems can also be validated in accordance with GMP and FDA. Production orders can be imported from existing ERP systems and reports produced following execution. Needless to say, combinations can also be realized with automatic batch systems.

### Online Moisture Analysis

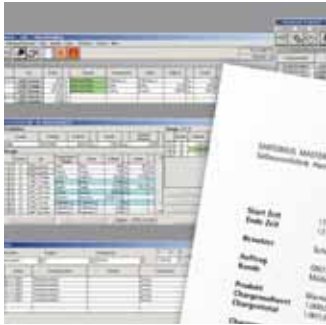
Product moisture is critical for process capability. To optimize product quality in the production process, moisture contents are checked and adjusted where appropriate. Fast access to moisture measurements must be available for this purpose. Results must also be immediately available during quality testing on intermediate and final products in order that the process cycle is not delayed. Online measurements can be made in less than a second using extremely fast microwave resonance technology for quick measurement with no sample preparation. As a result, moisture content in production can be regulated and monitored fully automatically.

### Measurement of the pH

The pH is measured in order to monitor fermentation and agitation processes – particularly in milk processing and the production of pickled vegetables. In doing so, both process and product parameters are tested in order to achieve consistently high product quality. Depending on the pH, flavoring additives are finely adjusted and in this way the process is optimized. These portable pH meters are the perfect solution for mobile use. Easy to handle, rugged and hard-wearing, they can be used wherever exact measurement is required on site.

### Data Acquisition

A permanent overview of the status of production must be available in order that the time-critical processes in the food industry can be adequately serviced. Furthermore, due to duty of documentation and for subsequent analysis of the production process, precise records and reports must be kept on process-relevant data (e.g. batch data and weights) in ongoing processes. Permanent recording of process status takes place by means of online data acquisition with various device drivers which also allow integration into existing IT environments. A comprehensive presentation of process conditions and statistics is produced from this data for the purposes of monitoring and servicing the process. Exceptional cases are reported in the audit trail. Production data is transferred to reporting tools and evaluated with the aid of MES systems based on low cost database solutions.



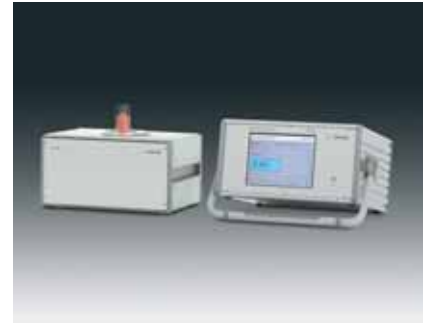
Recipe management with the creation of a batch report using ProBatch+



Easy-to-clean CombiCS food scales with IP67 + IP69K



Batching with system controllers from the X-Family



LMA300P: Online moisture analysis using microwave resonance technology for seamless process monitoring



## 4 Packaging and Outgoing Goods

### Average Weight Control of Prepackages

When filling and packaging a final product, the aim is to avoid overfilling in order to save costs. However, while doing so, country-specific legal regulations, such as the European prepackage directive, must also be observed. It is essential to find the best compromise here, although unavoidable process variations sometimes make this task considerably more difficult. Furthermore, the requirements of HACCP must also be strictly adhered to at this stage of the process. Seamless batch identification and traceability must likewise be guaranteed. Our average weight control systems allow perfect realization of both static solutions for sampling and also inline solutions based on dynamic control scales for 100% control with sorting. Fill quantities are recorded directly in the process with immediate reporting to the control station, thereby avoiding costly production errors. The consistent implementation of hygienic design standards for easy cleaning of the control scales and the high resolutions despite high maximum loads offer considerable advantages in practical use. A variety of system architectures is available, from the low cost stand-alone station solution through to network solutions connected to the enterprise's computer system. Finally, dynamic control scales with integrated metal detection technology can even fulfill two important tasks in a single process step.

### Statistical Process Control | In-process Control

Any desired parameters such as temperature, heat seal temperature, pH-value, moisture content, Brix value and oxygen content can be estimated, measured and finally recorded. These measurements can be compared with each other or recalculated using fixed factors to form new performance figures. Intelligent industrial terminals with flexible interfaces to almost all sensors in and on the process, which facilitate direct recording during the production process and immediate monitoring, evaluation and control, serve this process. The goal is to exploit all optimization potential and ensure that production is safe and true to specification while naturally complying with legal regulations such as batch traceability/HACCP and meeting standards such as IFS/ISO 22000.

### Attribute Testing

Incorrectly applied labels, incorrect expiry date, illegible printing or barcode, poor opening capability, uneven heat-sealed joints and untight foil bags are examples of packaging attributes which render products unsuitable for delivery. Other examples of ambient attributes are failure to comply with CCP monitoring, unacceptable cleaning results and too high cooling temperatures. A variety of intelligent industrial terminals and PCs also facilitate tailor-made solutions for the desired scope of the application directly in and on the process.

### Detection of Foreign Objects

To guarantee consumer protection and rule out the possibility of product liability claims it is essential for packaged end products to be checked for metallic contamination and segregated or rejected where appropriate. Metal detection devices have a variety of electronic systems and an extremely wide selection of metal detection coils of different structural shapes and sizes. They meet hygienic design standards and as such are easy to clean while simple to operate with straightforward product changeover. Both packaged and unpackaged products/materials are checked, whereby optimum results are achieved due to multi-frequency technology – even on changing product effects (moisture, temperature, etc.). Even products in aluminized packaging can be checked for impurities as a result of the optimization of throughput and detection accuracy.

### Order Picking | Completeness Control

It is important to check the total weight of the shipping unit when arranging products for dispatch to the customer in order to check for completeness and to determine the shipping weight. Desktop and floor scales are available in a variety of designs and structural shapes as well as different load ranges and resolutions in a robust construction suitable for industrial applications. In addition, there is a wide array of indicators from easy, convenient weight recording through to PC-based versions with network connection.



Fill quantity control with the Combics series



Detection of foreign objects even through aluminum packaging



Individual remote control of checkweighers with Sartorius ProControl@Remote

## 5 Services

Sartorius services range from installation and maintenance to equipment qualification all the way to engineering. As a result, we give you peace of mind knowing that your processes will work efficiently right from the start. For as a globally operating service organization, we see ourselves as your knowledgeable and results-oriented partner who will support you from the word go in helping you achieve your process goals.

### Qualification (IQ | OQ | PQ)

The qualification of measurement systems is mandatory in many areas of the pharmaceutical and chemical industries as well as in the food and beverage sector. We therefore make it easy for you to meet the requirements of the GLP | GMP regulations and provide you with complete, comprehensive documentation in the weighing instrument logbook.

### Factory Acceptance Test (FAT)

More and more customers in the regulated industry are demanding equipment acceptance testing from the manufacturer (FAT) as a prerequisite for releasing a shipment. In our FAT we carry out all necessary product tests for you. You therefore receive documentary evidence that the product meets all your requirements.

### Installation and Commissioning

We install and configure your equipment according to the required specifications and adapt it to the ambient conditions at the place of installation. This means that your weighing instruments are configured for your requirements, immediately ready for operation and calibrated on site.

### Maintenance and Maintenance Contracts

Regular maintenance ensures that your equipment is correctly calibrated, adjusted and cleaned. This guarantees optimum equipment performance and high service life and prevents unnecessary downtime. In addition maintenance contracts simplify your maintenance cost planning.

### Repairs and Corrective Maintenance

In the unlikely event that your equipment happens to fail, our trained service technicians will repair it on your premises or at our local repair centers. Sartorius services range from installation and maintenance to equipment qualification all the way to engineering. As a result, we give you peace of mind knowing that your processes will work efficiently right from the start. For as a globally operating service organization, we see ourselves as your knowledgeable and results-oriented partner who will support you from the word go in helping you achieve your process goals.





Issuing a DKD calibration certificate with benchmark test



IQ/OQ qualification at the customer's premises



Equipment repair at our Repair Center



Equipment acceptance during a FAT



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