Testo
Application example

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# Save time and money in the sterilization and pasteurization of foods with the testo 191 data logger system.


Temperature and pressure must be constantly monitored in the sterilization and pasteurization of foods. This ensures that the measuring values required for the respective preservation food process are adhered to and that the temperature is uniformly distributed in the corresponding systems.

The testo 191 data logger system is the intelligent solution for the monitoring and documentation of temperature and pressure in sterilization and pasteurization processes. The system consists of four different temperature data loggers: one pressure data logger for any application. The loggers seamlessly interface with one multifunction case and intuitive software for programming and readout of the logger in a fast paced and continuous food processing environment.

The smart all-in-one solution from Testo enables you to monitor food production processes more efficiently while optimizing each process sustainably. This means you reliably adhere to quality regulatory standards while saving time and money during continuous processing.

Testo North America
www.testo.com
800-227-0729
info@testo.com

Pasteurizing fruit juice beverages.

Autoclaving canned sausage.

# The Challenge

According to the stipulations of the EU hygiene package, in particular directive (EC) no. 178/2002 and directive (EC) no. 852/2004, the responsibility for food safety lies with the food producer. This is also the case with FDA regulations stated in 21 CFR Chapter 1 Subchapter B and FSMA (Food Safety Modernization Act)

Food production facilities must introduce a self-monitoring system (HACCP/FSMA) based on a risk analysis and define critical control points and production processes which are to be used within the facility. In particular when it comes to thermal preservation, facilities must validate and document the safety and efficacy of the food production process through continuous time, temperature, and pressure measurements.

In especially critical processes, it is necessary that the preserved product should not be released or further processed without a full analysis of the temperature and pressure data.

In addition to the effectiveness of the process, the food producer must ensure, by means of regular testing, that the equipment and systems used for the food preservation process are functioning correctly according to their specifications for each production run.

However, it is not only the safety of the foods which is of interest during preservation. The flavor and texture of the final product is also an important piece of the puzzle, as both are crucially dependent on constant conditions during the preservation process.

Both the results of the temperature and pressure monitoring during the preservation process and the results of the validation of the systems used must be impeccably documented by the staff responsible while being provided as proof for internal or external audits.

In order to fulfill these strict regulatory and internal company requirements, quality supervisors generally rely on system solutions consisting of data loggers and software. However, these solutions are often complicated to handle and susceptible to wear and tear, making daily work more time consuming and difficult than necessary.

# The Solution


**The 191 complete solution**

The testo 191 data logger system simplifies the monitoring and documentation of temperature and pressure in sterilization, pasteurization and freeze-drying food production processes. The completed system solution comprises of five robust data loggers which operate with intuitive software which is safely stored or transported with a multifunction case that also acts as a programming and readout unit.

**The data loggers**

The data loggers for temperature are made of stainless steel and robust polyether ether ketone (PEEK). Both materials are food safe, and both the loggers and software are HACCP International certified.

Due to their small design, the data loggers can be used in smaller systems without any problems. The loggers can even be placed in small tubular bags, jars or cans. Testo offers flexible measurement probes with a length of up to 775 mm in order to enable measurement between products or in other identified gaps in a system which are difficult to monitor. The size of the data loggers can also be changed instantly by the use of two batteries of differing heights, which can be freely combined with all data loggers.

The measuring range of the data loggers goes from -50 to +140°C or 1 mbar to 4 bar abs. The probes of the models are rigid or flexible and differ in length (rigid: 25 mm and 115 mm, flexible: 775 mm).

**The battery concept of the data loggers**

A world innovation of the system that greatly facilitates the work of quality supervisors in the food industry: the data loggers' battery and the measuring technology can be changed from large to small in two separate housings. The screw cap of the different sized batteries enables both types to be quickly and easily changed without any tools at all. Anyone can change the battery quickly in no time while also keeping the loggers 100% airtight.


The testo 191-T1 data logger in both battery versions.

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**Equipped for every challenge: testo 191 accessory applications**


Temperature measurement in a can:
testo 191-T1 + stand


Temperature measurement directly in the food:
testo 191-T1


Temperature measurement in a can/bottle with the logger fitted externally:
testo 191-T2 + can and bottle attachment


Measurement of ambient temperature:
testo 191-T1 + retaining clamp and cable / zip tie (cable / zip tie not included in purchase)

Temperature measurement in particularly deep cans/ bottles:
testo 191-T3 + can and bottle attachment


Temperature and pressure measurement for sterilization in autoclaves:
testo 191-T1 + testo 191-P1


Depending on the application, you can vary the size of the logger through our flexible battery concept.

Temperature measurement in freeze-drying:
testo 191-T3/-T4 + freeze-drying probe holder

Because only safe foods really taste good: testo 191-T2 with can and bottle attachment measuring the temperature of a fruit juice.

**The multi-function case**

The safety transportable case with integrated programming and readout unit is also used to configure and read out up to eight data loggers at a time. Configuration and readout is carried out by USB connection to the testo 191 professional software. All that remains to be done is to set the relevant acceptance criteria and parameters for recording the pertinent production data.


Multifunction case for up to eight data loggers.

**The testo 191 professional software**

In contrast to other software solutions for sterilization and pasteurization data loggers, the testo 191 professional software is impressive due to its intuitive self explanatory user guidance. The 191 professional software clearly focuses on only the functionality which you really need for your daily work.

- Users have the choice to configure and program the loggers for whatever required process is needed. You can configure each data logger individually or simultaneously transfer one configuration to up to eight data loggers at once.
- The exemplary visualization and explanation of individual process parameters (e.g. temperature span, minimum hold time, maximum acclimatization time, etc.) will support you in the configuration of the measurement parameters.
- The starting time of the measurement is freely selectable – either a certain start time can be selected or a cycle can start when a defined measuring value is above or below the expected set parameter.
- After the measurement is finished, you can immediately see whether the test passed or failed the configured acceptance criteria. You can visualize the measurement results individually for each logger, or in parallel, in a graph or table format within the software.
- Upload photos of the system being used and positioning of the data loggers within the measurement process, in order to visualize and document the measurement set-up clearly.
- Additionally, you can display the temperatures measured over time in the system image.
- Reports can be created automatically or individually. You can generate a PDF report with one click of the mouse.

# Fast, efficient, reliable: The advantages at a glance.

The testo 190 data logger system helps you save time and money when monitoring temperature and pressure in sterilization, pasteurization, and freeze drying food production processes by combining three important technological improvements. Reliable and innovative technology with the highest level of precision, seamless integration into your processes and increased efficiency in the daily work-flow.

**Save time**

- No preparation time is needed for measurements with the testo 191 data loggers (e.g. for cable bushings or sealing).
- The data loggers' batteries can be changed quickly and securely.
- You can simultaneously program and read out up to eight data loggers in the multifunction case.
- The intuitive software and the 1-click report save you time when evaluating and documenting the measurement data results.

**Measure more efficiently**

- Equipped for every measuring task: the intelligent battery concept means you can adjust the logger size to the space available.
- The long, flexible probes of the testo 191-T3/-T4 measure even in difficult-to-access areas.
- Using the testo 191-T4, you can take two readings or measure temperature differences with just one logger.

**Rely on your equipment**

- The innovative design of the data loggers ensures 100% tightness after the battery is changed.
- High-quality materials and the innovative construction make the testo 191 data loggers particularly robust and durable.

**More information.**
You can get further information and answers to all your questions concerning temperature and pressure monitoring for sterilization and pasteurization from our experts.

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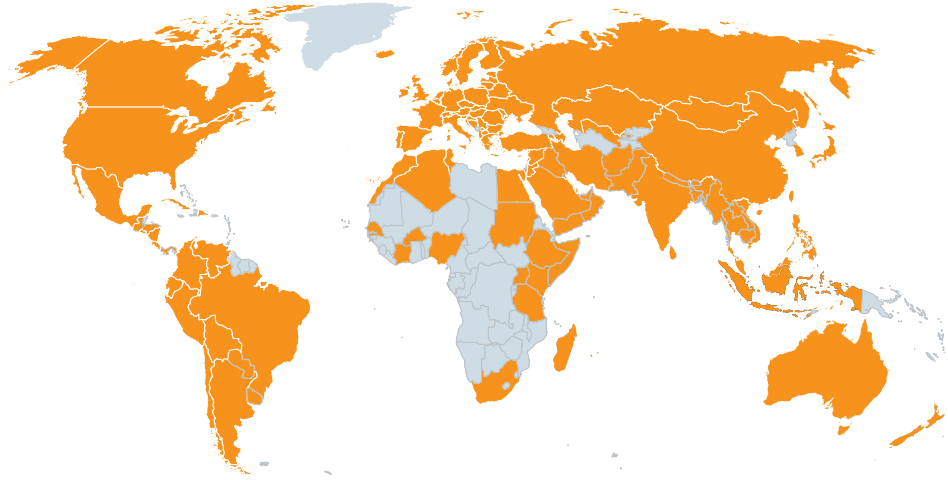
# Testo:
# High-tech from the Black Forest.

Testo is a world leader in the design, development, and manufacture of innovative products and services for environmental and industrial measurement. For more than 60 years, leading companies in the life sciences industries have relied on Testo to help protect their products.

Testo's first product was a simple electronic thermometer. Today, the product line has expanded to include a large variety of critical measuring instruments, such as data loggers, air velocity meters, humidity and dew point meters, sound, pressure, and light meters.

With over 2,700 employees in 33 offices worldwide, Testo understands local requirements and culture. Testo currently has hundreds of thousands of data loggers in the market, storing over 17 billion data sets.



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Testo North America
www.testo.com
800-227-0729
info@testo.com