

Take a Picture Of Your Process



Temperature profiling is the process of recording and interpreting temperatures of products or air through a conveyerized process or during a batch process. The data is displayed as a graph, or profile, and as numeric data. In its simplest form, this information tells you how hot your product became and for how long, and what temperatures it reached and at what point. Process engineers know what the perfect profile for their product should be, so variations from the ideal indicate a potential problem or unacceptable quality. By analyzing the profile, you are able to verify products are of the highest quality, increase throughput and solve production problems.

Should you profile your process? Your oven is the heart of your business. The quality and reliability of your finished product depends upon its performance. Routine temperature profiling gives you reliable data to optimize your process, prove process control and make corrections when required. In addition, today, compliance and traceability are key issues. A product report proving compliance to manufacturing specifications may not yet be a requirement, but it is likely to be a major selling point for your product. You don't question why your doctor takes your pulse and blood pressure, do you? Temperature profiling provides the same thing for your production line: It is like getting a clean bill of health from your doctor.

Routine profiling can help you:

- Rapidly set up new processes.
- Identify problems before they affect quality.
- Find faults quickly.
- Increase productivity.
- Prove process control (QS/ISO 9000).
- Minimize fuel costs.
- Control product quality.



Dataloggers fitted with radio frequency transmitter modules can send temperature data live to the receiver unit while communicating directly with an operating PC running analysis software.

To get accurate and reliable temperature profiles, this is all you need to do. First, start the logging process with predefined settings simply by activating the datalogger. Second, place the logger in the thermal barrier and attach the thermocouples to your product. Third, run the datalogger through your thermal process. Fourth, safely retrieve the barrier from your

process and download the collected data to your computer. Finally, view, analyze and report with software.

Most temperature profiling systems comprise three major components -- datalogger, thermal barrier to protect the datalogger while it is in the oven, and software to analyze the data.

Benefits of Profiling

Rapidly Set up New Processes. Routine monitoring of your process gives you a database of profile information that will help you develop new processes accurately and efficiently. You'll know exactly what temperature settings and line speed will give you the best quality product.



Identify Problems Before They Affect Quality. Statistical process control functions identify potential problems, allowing you to schedule preventive maintenance at your convenience.

Radio telemetry allows data to be both recorded by the datalogger as it travels through the oven and transmitted directly to a receiver connected to a PC running the profiling systems operating software. With such a setup, product and oven temperature can be viewed and analyzed live within the oven.

Find Faults Quickly. When problems occur because of improper heating, you'll quickly spot the cause and location. Analyze the profile information to determine necessary corrective action, then run followup profiles to prove the changes were successful.

Increase Productivity. Analysis of your profiles will show you how and where you can optimize operations. By rebalancing the time-at-temperature and heat ratios, you may be able to increase line speed and product throughput. And, by knowing exactly what is happening to your product in your process, you'll be able to minimize time spent on test runs and process setups -- allowing a greater number of profitable production runs.

Prove Process Control (QS/ISO 9000). Some profiling software provides a single-page standard report that can be used to prove process control. In most cases, all of the data files are fully traceable as well. Each file includes operator name, product type and datalogger information in addition to temperature data to prove that your process is being performed in a controlled and repeatable manner.

Minimize Fuel Costs. Rising fuel costs can significantly impact your operating budget. The simple fact is that lower costs mean higher profits. Temperature profiling gives you the information you need to make the best possible product with the highest efficiency: Less heat equals less fuel.

Control Product Quality. A growing scrap pile or increased customer returns means only one thing -- something has gone wrong. If you know precisely what is happening to your products during production, you can reduce rejects, rework, scrap and returns. Prevention is not as exciting as solving a problem once it has occurred, but it is a lot more profitable.

Sidebar: Q&A About Temperature Profiling

What Data Is Provided?

Most profilers come with user-friendly software that provides two types of data: graphic and numeric. The graphical data can be overlaid with previous profiles or tolerance bands for immediate profile verification. Numerical data can be processed to produce industry-specific measurements of process performance.

How Often Should You Profile?

Some companies profile several times daily, others less often. Whatever your preferred schedule, you'll quickly discover that routine profiling pays for itself.

Is Profiling Hard to Do?

Most profilers are easy to use and understand. Programmable software lets you predetermine exactly what software operations each line operator can access. Some profilers have a simple one-time user configuration session that will tailor the screen and accessible software features to the precise tools the user needs. Password protection makes sure the data remains uncorrupted by unauthorized access or error.

My Process Is Very Long and Hot. Can I Profile It?

While not every process can be profiled, many can. Temperature profiling systems are available that can handle processes as short as 10 sec to as long as 10 days. Processes with temperatures as high as 3,000°F (1,650°C) can be profiled. With loggers accurate to 0.5°C and able to store more than 100,000 readings, there is almost no process that cannot be measured.