

# Time temperature indicator

From Wikipedia, the free encyclopedia

A **time temperature indicator** (TTI) is a device or smart label that shows the accumulated time-temperature history of a product.<sup>[1]</sup> Time temperature indicators are commonly used on food, pharmaceutical, and medical products to indicate exposure to excessive temperature (and time at temperature).

In contrast, a "temperature data logger measures and records the temperatures for a specified time period. The digital data can be downloaded and analyzed.

<b>Contents</b> <span>[</span> hide <span>]</span>
1 Technology
2 TTIs food industry
2.1 Benefits
3 Regulation
4 See also
5 References
5.1 General References
6 External links

## Technology [edit]

There are a large number of different time temperature indicators available in the market, based on different technologies. Some devices are based migration of dye through a filter paper, while others contain pouches with bacterial fluids that change color when certain time-temperature combinations have been reached. To the degree that these physical changes in the indicator match the degradation rate of the food, the indicator can help indicate probable food degradation.<sup>[2]</sup> Digital Temperature data loggers are available to indicate the full temperature history of a shipment to help identify the time period that out-of-tolerance temperatures were encountered. This temperature history can be used to calculate the loss of shelf life or the likelihood of spoilage. These small recorders are also used to identify the time (and thus location) of a shipment when the problem occurred, which allows for corrective action.

## TTIs food industry [edit]

Time-temperature indicators can be used on food products that are dependent on a controlled temperature environment. Certain technologies can also be used for frozen food and the cold chain.


## Benefits [edit]

Surveys within the EU projects "Freshlaber" and "Chill-on" have shown a positive feedback by consumers to the use of TTIs on food products. As TTIs help assure the cool chain of food products, they are expected to reduce the amount of food waste,<sup>[3]</sup> as well as reducing the number of foodborne illnesses.<sup>[4]</sup>

## Regulation [edit]

The World Health Organization regulates the use of TTIs for certain medical products. There is extensive regulation by the FDA on the use of TTIs on US seafood products.<sup>[5]</sup>

## See also [edit]


**WIKIPEDIA**  
 The Free Encyclopedia

- Main page
- Contents
- Featured content
- Current events
- Random article
- Donate to Wikipedia
- Wikipedia store

- Interaction
- Help
- About Wikipedia
- Community portal
- Recent changes
- Contact page

- Tools
- What links here
- Related changes
- Upload file
- Special pages
- Permanent link
- Page information
- Wikidata item
- Cite this page

- Print/export
- Create a book
- Download as PDF
- Printable version

- Languages
- العربية
- Deutsch
- Français
- Nederlands

 [Edit links](#)