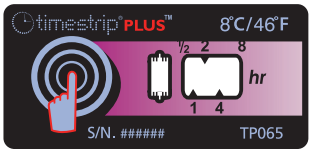
timestrip®

the smart way to measure time & temperature

Timestrip® PLUS FAQ



What is Timestrip® PLUS?

It is a single use temperature indicator in a self-adhesive label format. It indicates if temperature has risen to breach a defined threshold and it records the cumulative elapsed time of all such breaches. Each product in the range is engineered to respond to a different threshold temperature so customers can choose the product that best suits their needs. The product shown indicates if temperature has reached or exceeded 8°C/46°F and records how long one or several breaches have lasted up to 8 hours.

How can I use Timestrip® PLUS?

They are suitable for many situations when elevated temperatures can create problems for a product. Common applications are frozen or chilled foods, medicines, vaccines, blood products, adhesives and chemicals. A common use is to identify the elapsed time of temperature abuse during shipping. Another is for products which are taken repeatedly in and out of their ideal storage conditions for temporary use, like lab chemicals. One or two excursions might not be problematic, but Timestrip® PLUS shows the cumulative time of all excursions and this can be used to trigger a timely replacement of the product.

How do Timestrip® PLUS compare with data loggers?

There are fundamental differences. Data loggers are expensive and typically are designed to go on large shipments. They are not an immediate tool as they need to be returned/connected for the data to be read and acted on, and they have to be used repeatedly to justify the expense. They also require power. Timestrip® PLUS indicators are less expensive, require no power, are single use and can be instantly read by the end user. They have unique serial numbers to ensure the traceability of each indicator to avoid the potential for manipulation across the distribution chain. As well as being effective for large shipments, Timestrip® PLUS are small light and cost effective enough to be used at the carton or single unit level. Using them at multiple points within a shipment or container can isolate unacceptable temperature pockets.

Data loggers provide a full history of temperature from the time of activation. Timestrip® PLUS records how long a product has been above its threshold temperature (up to the maximum printed on the scale - usually 8 or 12 cumulative hours) but cannot tell you when the breach or breaches occurred.

Timestrip® PLUS is most often used to monitor and validate the “last-mile” of a cold chain or other temperature environment, in other words, when the product is close to its eventual use.

In some cases data loggers and Timestrip® PLUS indicators may be used in complementary ways to help monitor temperatures.

What temperature thresholds does the Timestrip® PLUS range include?

Our range extends from the lowest threshold of -20°C/-4°F up to the highest at +38°C/100°F. We have many products in between. The most popular temperatures can be ordered from stock and the rest can be ordered subject to minimum volumes.

Standard products held in Stock:

-20°C, 0°C, 8°C, 10°C, 25°C

(-4°F,32°F,46°F, 50°F, 76°F)

Standard products available subject to MOQ:

-14°C, 3°C, 5°C, 12°C, 18°C, 20°C, 30°C, 34°C, 38°C

(7°F, 37°F, 41°F, 54°F, 64°F,68°F, 86°F, 93°F,100°F)

Specialist products held in Stock:

We hold stock of 4 temperature indicators designed for specific uses; Seafood, Food, Blood Temp 10 (for blood bags) and Duo (two threshold indicators in one label, for Vaccines). Additional data sheets and FAQs are available for these products.

Our products have been tested at maximum and minimum temperatures between -30°C/-22°F and 60°C/140°F. Our products should not be exposed to temperatures outside of this range.

How does Timestrip® PLUS work?

A blue dye housed in a blister is held adjacent to a micro-porous membrane. Upon squeezing the activation button the liquid dye comes out of the blister and into contact with the membrane. If the temperature of the product is below the stated ‘STOP’ temperature, the blue dye changes state to solid form, and it is unable to move through the membrane. If the temperature rises to or above the threshold temperature, the dye changes to liquid form and moves at a precise rate through the membrane. Its progress is irreversible and the distance it travels through the viewing window indicates the cumulative time the indicator has been exposed to the threshold temperature or above.

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Why do Timestrip® PLUS have a start/threshold temperature and a 'STOP' temperature?

The melting point of a solid is the temperature at which it changes state from solid to liquid. The freezing point (or crystallization point) is the temperature at which a liquid changes to a solid. For certain substances the melting and freezing point are not the same and the freezing point is lower than the melt point. This behaviour is called hysteresis. At the STOP point (freezing point) the dye can't move. At the melt point the dye moves and indicates a threshold breach.

Why is there an activation window and a breach window?

The activation window gives confidence that the product is armed. The breach/run-out window is separate so that it clearly indicates a breach of the temperature threshold and the cumulative elapsed time of the breach.

Do I need to pre-condition Timestrip® PLUS indicators prior to activation?

No. Unlike some other threshold temperature products, Timestrip® PLUS does not require pre-conditioning.

You need to activate above the product's threshold temperature, as you cannot squeeze the dye out of the blister if it is in solid form. Immediately after activation, stop the progress of the dye by placing the indicator below its STOP temperature. You can adhere the Timestrip immediately to a product or carrying card which is below the STOP temperature. Alternatively place the activated indicator in an environment much colder than the STOP temperature for a short period of time.

Do Timestrip® PLUS have any special storage requirements before activation?

No, unlike some other threshold temperature products, Timestrip® PLUS can be stored inert at ambient temperatures and only activated when needed.

What is the shelf-life of Timestrip® PLUS?

Most Timestrip® PLUS products are provided with a shelf life of 2 years from shipping from our premises. Some formulations may be provided with a shelf-life of 2 years from date of manufacture. In all cases, an expiry date is provided for each batch of products supplied.

How accurate are Timestrip® PLUS?

+/- 1˚C for the temperature component and +/- 15% for the time component under isothermal conditions.

The progress of the blue dye across the time-markers is calibrated to a temperature of 2˚C above the stated threshold temperature.

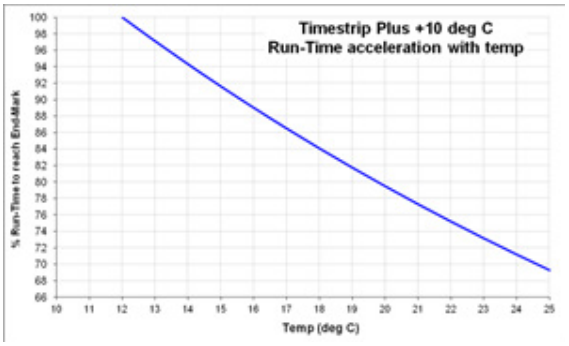
For example, the time markers for Timestrip® PLUS 12˚C are calibrated to a temperature of 14˚C.

When the product breaches its threshold temperature and is held at a constant temperature of 14˚C (i.e. isotherm), the blue liquid will reach the 1 hour print mark within 1 hour (+/- 15% in time). If the breach is at a much higher temperature than the stated threshold temperature, the indicator dye becomes thinner and will run faster.

What happens at elevated temperatures?

Due to the nature of liquids, higher temperatures reduce the viscosity of the liquid dye in Timestrip® PLUS. The correlated result is faster/shorter run-times (the progressing blue dye will reach each printed time-mark sooner than intended). So, if an 8°C/46°F indicator is exposed to 25°C/77°F for a consistent period then the blue dye will progress more quickly through the membrane than if it was exposed to 10°C/50°F for a consistent period.

This graph shows the run-time acceleration of a 10°C/50°F Timestrip® PLUS at different elevated temperatures.



The y-axis represents the actual run-time of the liquid dye at different temperatures, and is expressed as a percentage of the specified run-out time at an isotherm of 12°C/54°F. So, at an isothermal temperature of 12°C, the liquid dye will reach each time-marker (1, 2, 4, 8, hours etc.) within these times +/-15% in time.

However, if for example the product is exposed to an isotherm of 21°C/70°F the dye will reach each time marker within only 77% of the intended run-time. In other words, it will reach the;

- 1 hour time-marker within approximately 46 minutes (77% of 1 hour)
- 2 hour time-marker within approximately 1.32 hours and so on.

At a less extreme temperature elevation, say 15°C/59°F the blue dye will reach each time-marker at 91% of the intended time.

Is the liquid dye safe?

Yes. Please see the Timestrip® PLUS MSDS on our website for further information. In the unlikely event that the liquid leaks from the Timestrip® PLUS and comes into contact with skin, simply wash with soap and water. If the liquid comes into contact with eyes, rinse immediately with plenty of water and seek medical advice.

What are your Acceptable Quality Limits?

The Accepted Failure Rate is based on ANSI/ASQC Z1.4 (formally MIL-STD-105E) Level II Normal Inspection. For Timestrip® PLUS the AQL is 0.65%. Packs are over shipped by 2-3 units per 100 to cover this AQL.

Timestrip® PLUS indicators go through extensive quality checks before they are shipped. Central to this process are tests against defined specifications for; run-time accuracy (how quickly the dye progresses through the membrane), environment sensitivity (high heat and vacuum tests to check resilience to harsh conditions during shipping) and also the accuracy of the threshold melting point. A full pack of release reports is provided with each shipment. Further details are available on request.

How are Timestrip® PLUS indicators evaluated for their time accuracy?

Timestrip PLUS are polymeric multi-layer indicators. They are based on spontaneous lateral wetting by a blue liquid inside a porous substrate and not a chemical reaction. Each production batch (7000 – 8000 products) undergoes strict quality control tests to validate its time accuracy.

This is conducted via a computer vision software (TSCV) which analyses scanned photos of seven randomly-selected products from each batch (roughly 0.1% of the population). The photos are taken at different elapsed times and the tested products are placed at their designated temperature through the entire test period. The software automatically analyses the lateral progress and the elapsed time of each product tested and the data is presented numerically and graphically in a specific file which is labelled by batch. This data is translated into a final release report which is attached to the outgoing product batches.

What if one of the indicators has got a blue activation window or there is blue in the run-out window, before I've pressed the activation button?

If stored under the correct conditions, there is very little risk of auto-activation, but this happens occasionally, and the built-in activation window lets you know it. If an indicator has auto-activated before use the activation window will already be showing blue and ON. The blue liquid may also be showing against the time-markers in the run-out window. If this happens, discard the indicator and select another.

There is no need to contact us, as we ship a few extra units per hundred anyway.

Can I get a false positive indication?

If the indicator is correctly activated false positives are extremely unlikely as the blue dye can only melt at or above certain temperatures. It is important to lower the indicator to its STOP temperature after activation and only attach it to a product, carrying card or material that is already at or below the STOP temperature to avoid premature indication.

Customising Timestrip® PLUS FAQ

Can you customize Timestrip® PLUS?

For a minimum order value of 50,000 units we can make a customised Timestrip ® PLUS. There is a set up and per unit premium for this service dependent on the specifications required. Graphic customisation can include changing the scale on the run-out window to different time markers and using customer logos and colours. It can also include hiding the progress of the blue dye so the end user just sees when a maximum elapsed time of temperature abuse has been reached.

Can I customise the temperature threshold if you don't make one that I need?

We have a wide range, but if none of our products suit your needs we can investigate a new threshold temperature. There is a cost for this development service and not all temperatures are possible. Please contact us for more information.

Can you provide customised instructions with the indicator?

Yes. We can provide a quote for printing custom carrier cards and backing labels for the indicators if required.

Can you provide Timestrip® PLUS on rolls?

Products are supplied loose in poly bags as standard. Subject to a premium and technical parameters, they can also be provided on rolls for integration into packaging lines or in boxes.

What is the maximum run-time Timestrip® PLUS range can offer?

The maximum run-time varies between hours to days dependent on the product and its application. Note that the run-time is only referring to the time above its breach temperature. Timestrip® PLUS can remain active and vigilant for long periods of time (up to a year after activated) if the run out window has not completely filled in.

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Further Information FAQ

Do you make any other temperature indicators?

Yes. We have four products designed for specific markets; Seafood, Food, Blood Temp 10 (for blood bags) and Duo (a double indicator in one label designed for vaccine monitoring).

Do you make any other type of indicator?

Yes, we make Timestrip® timers. These are handy self-adhesive labels that monitor any elapsed time within the range of 5 minutes to several years. Durations of 1, 3, 6 or 12 months can be ordered from stock or Timestrip® can be fully customised to suit your needs. They can be stuck directly onto a product or device and act as a simple visual reminder to replace an expired product or carry out a task, like maintaining a machine or checking results from a test.

How can I find out more?

A full range of technical documents is available for each of our products including; a general information sheet with instructions for use, a test protocol, a specification and an MSDS. All these documents are available on our website.

Who do I contact to place a stock or custom order?

Many of our products are sold through distributors.

Please contact us for more information.