Timestrip®PLUS
Generic TestingProtocol

For products: -20˚C, -14˚C, 0˚C, 5˚C, 8˚C, 10˚C, 20˚C, 24˚C, 25˚C, 30˚C, 38˚C

Testing Threshold Temperature

Tools:

1. Circulating water bath with temperature accuracy of ±0.5˚C and temperature stability of 0.1˚C.
2. Oven (only needed if the product Threshold temperature is above ambient room temperature).

Method:

1. Set the bath circulator to the stated Stop Temperature of the product (see table below). Make sure the temperature inside the bath has stabilized at the set point value.
2. Adhere all test products to a rigid paper or plastic card using the supplied adhesive. Place the test products inside a waterproof and oven proof plastic bag.
3. This action is only for products which have a Threshold Temperature above ambient:
   I- Set the oven to any temperature above the product Threshold Temperature. Temperature should not exceed +60 ˚C.
   II Place the bag with the products inside the oven for 5 - 10 minutes.
   III- Remove the plastic bag with the products out of the oven and immediately activate the products as instructed in #4.
4. Activate test products by a firm squeeze on each product button through the plastic bag. Activation should be made with two fingers acting against each other. Verify that the activation window shows a dark blue line, which widens rapidly, revealing the word ON (in white).
5. Immediately after activation, submerge the bag with the test products into the liquid bath. Make sure the products are completely submerged under the liquid level for the entire duration of the test. The open side of the bag should be left above the liquid level keeping the inside of the bag dry.
   All visual referencing is to be done without removing the product from the liquid.

6. Wait at the stop temperature for a time period which is twice as long as the shortest printed time-mark (i.e. when the shortest printed time mark is 1/2 Hr, wait 1 Hr. If it is 1 Hr, wait 2 Hr. etc…). Verify that the blue dye has not progressed into the run-out window after the time cycle. This confirms if the indicator has stopped and the blue dye is in a solid form.
7. Increase the bath circulator temperature to +1.5˚C above the product stated/printed Threshold temperature.
   Verify that the blue dye has progressed into the run-out window within the time period defined at #6.
8. End.

Activation Window

Run-out Window
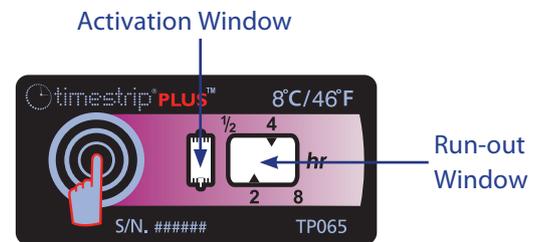
| Threshold Temp	Stop Temp
-20C / -4F	-25C/ -13F
-14C / 7F	-20C / -4F
0C / 32F	-7C / 19F
5C / 41F	0C/ 32F
8C / 46F	6C / 43F
10C / 50F	8C / 46F
20C / 68F	18C/ 64F
24C / 75F	22C/ 72F
25C / 77F	22C/ 72F
30C / 86F	27C / 81F
38C / 100F	34C / 93F

Testing Progress Accuracy

Tools:

1. Controlled environment chamber with temp-accuracy of ±1˚C.
2. 2.Temperature thermometer data logger.

Method:

1. Put the temperature thermometer data logger into the controlled environment.

2. Set the controlled environment to 2°C above the stated/printed Threshold temperature. Make sure the temperature has stabilized.

3. Adhere all test products to a rigid paper or plastic card using the supplied adhesive.

4. I- Preheat the bag with the products at the conditions given in step #2 for a minimum of 5-10 minutes.
   II- Remove the plastic bag with the products out of the oven and immediately activate products as instructed at #5.

5. Activate test products by a firm squeeze on each product button. Activation should be made with two fingers acting against each other. Verify that the activation window shows a dark blue line, which widens rapidly, revealing the word ON (in white).

6. Note the time of activation. The time of activation will be defined as elapse time zero.

7. Place the product immediately inside the controlled environment close to the thermometer data logger.

8. Verify that the blue dye has reached each printed time mark within ±15% of the elapsed time. Optional - photograph the test products at both 15% prior and 15% after each of the representative printed time lines. Do not remove the products from the environment for longer than 30 seconds.

Print Time marks
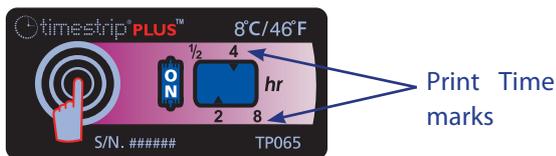
For example: The blue dye line should reach the 1 Hr print mark (i.e. 60 minutes) between 51 minutes and 69 minutes. This correlates to ±15% in time.

9. Repeat this procedure for subsequent print marks.

10. Download the temperature profile from the temperature data logger and confirm that the temperature during the entire test matches the set point.

11. End.