

WarmMark is a single-use, ascending time-temperature indicator which alerts users of exposure to unacceptable temperature conditions.

Arming & Use: (WarmMark Short Run, Long Run, Duo)

- *All WarmMark breach window(s) should be white prior to arming the device.
- Before arming, the WarmMark indicator should be placed in an environment at least 5°C (9°F) below the WarmMark's activation threshold temperature for a minimum of 30 minutes. (For WarmMark Duo, the indicator should be at least 5°C (9°F) or cooler for a minimum of 30 minutes.)
- To arm the WarmMark indicator, fold up and pull out the indicator's activation tab until the tab and barrier film have been completely removed.
- If using a WarmMark indicator with an activation threshold temperature below the ambient temperature, immediately place the indicator in the environment to be monitored to avoid activation.
- Remove the adhesive liner from the WarmMark and adhere the indicator to a clean, dry surface.
 - The WarmMark should be located where it will be visible to the receiver of the monitored shipment.
 - The WarmMark can be adhered directly to the product being monitored or located inside the packaging.

Interpreting the WarmMark

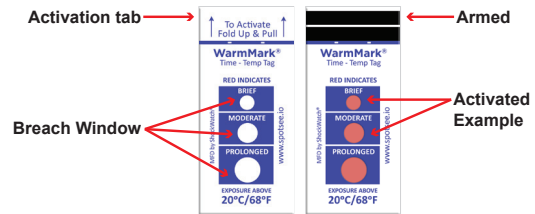
When the WarmMark is exposed to conditions above the indicator's activation temperature $\pm 1^\circ\text{C}$ ($\pm 2^\circ\text{F}$), a red dye will begin migrating through the run-out window(s).

Run-out times are based on a temperature 2°C (4°F) above the indicator threshold. If the temperature is greater than 2°C (4°F) above the activation temperature of the device, the run-out will occur faster.

Storage Recommendations

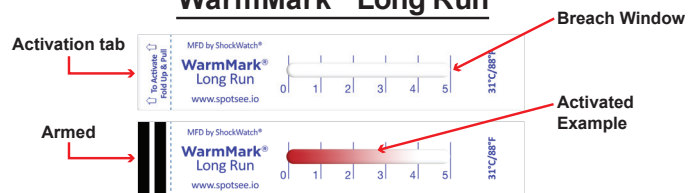
WarmMark indicators should be stored in a cool dark place below the activation temperature of the indicator and between 35-55% relative humidity (RH).

WarmMark® Short Run



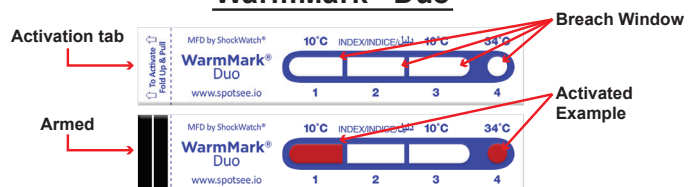
| Threshold Temp | Run-Out Times | | |
|---|---------------|----------|-----------|
| | Brief | Moderate | Prolonged |
| -18°C / 0°F | 1 hour | 3 hours | 12 hours |
| 0°C / 32°F 8°C / 46°F 10°C / 50°F 20°C / 68°F | 2 hours | 12 hours | 48 hours |
| 5°C / 41°F 25°C / 77°F 30°C / 86°F 37°C / 99°F | 30 minutes | 2 hours | 8 hours |

WarmMark® Long Run



| Threshold Temp | Run-Out Times | | | | |
|----------------|---------------|----------|----------|-----------|-----------|
| | Line 1 | Line 2 | Line 3 | Line 4 | Line 5 |
| 10°C / 50°F | 12 hours | 30 hours | 60 hours | 110 hours | 168 hours |
| 31°C / 88°F | 12 hours | 30 hours | 60 hours | 110 hours | 168 hours |

WarmMark® Duo



| Threshold Temp | Run-Out Times | | | |
|----------------|---------------|----------|----------|----------------|
| | Window 1 | Window 2 | Window 3 | Window 4 |
| 10°C / 50°F | 3 days | 8 days | 14 days | - |
| 34°C / 93°F | - | - | - | Within 30 mins |