



## Simple, Effective Temperature Monitoring of COVID-19 Vaccine from Distribution to Administration

### Monitoring Temperature During Distribution is only Half the Battle: The Last Steps are Most Critical

Delivering COVID-19 vaccines to 7.8 billion people is a daunting challenge that will stretch supply chains past their limits. These vaccines in particular are very susceptible to temperature deterioration. Cold chain requirements will be different depending on whether the vaccine is being monitored in transit or at an inoculation site. Everyone is focused on the transit requirements, but what can you do to monitor temperature after the vaccine is thawed? The reality is that the last few steps before administration can be the difference between an effective or ineffective vaccine.

Vaccines must be kept at the right temperature to remain effective, even a few degrees temperature difference for even a short period of time can damage the vaccine, so how do you know if they have maintained efficacy prior to administration?

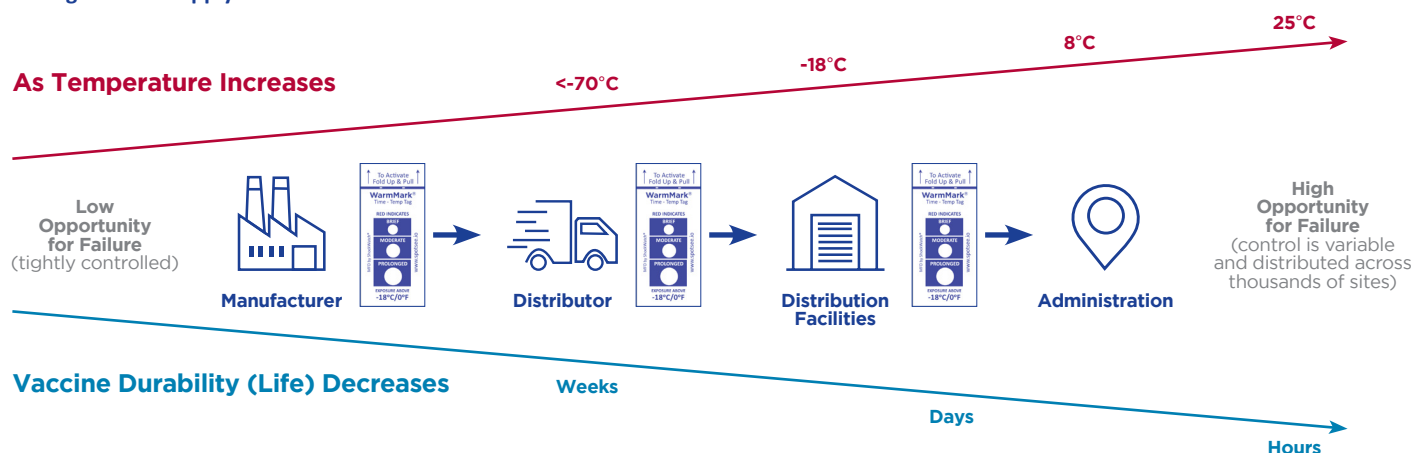
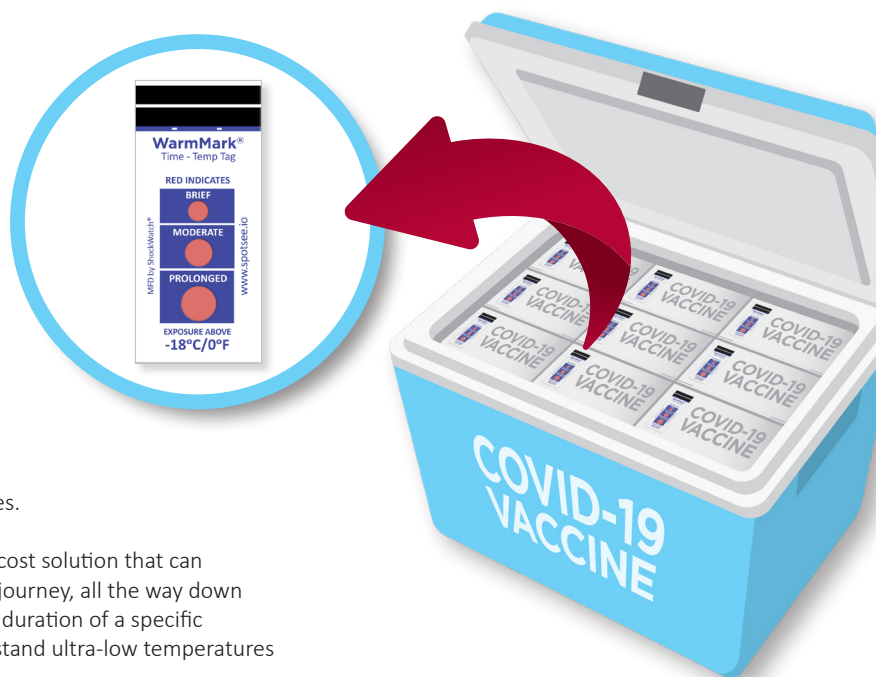
### Monitoring Temperature During COVID-19 Vaccine Shipping

As COVID-19 vaccines start shipping around the world, now is the time, to ensure temperature monitoring is in place. With the vaccine being so precious, it is critical to know that all doses administered meet efficacy standards and the patient is protected and waste is minimized.

While many logistics companies, distribution facilities and even trucks have electronic temperature monitoring solutions, they are often far-far removed from the vaccine itself and not necessarily representative of the temperatures experienced. Additionally, because of their high cost and infrastructure requirements, these solutions do not transfer with the vaccines as bulk gets broken from large truckloads all the way down to individual boxes and vials at administration sites.

SpotSee's WarmMark® time-temperature indicators are a low-cost solution that can accompany multiple packing levels from the start of a vaccine's journey, all the way down to vaccines at an administration site. WarmMark gives you time duration of a specific temperature exposure, does not require batteries and can withstand ultra-low temperatures when applied before the vaccine is frozen.

**BEST PRACTICE:** Apply WarmMark to the COVID-19 vaccine packaging before it is shipped or stored to monitor the vaccine's efficacy throughout the supply chain.



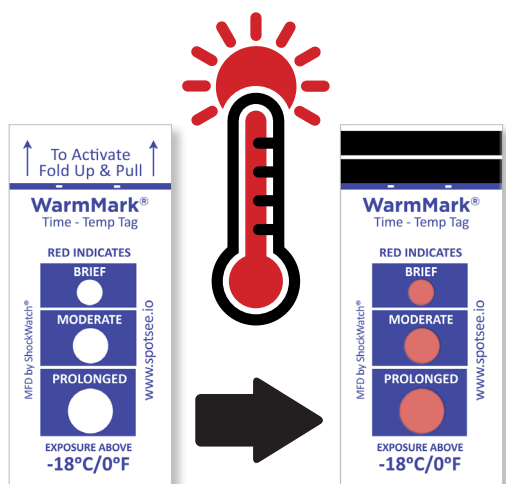
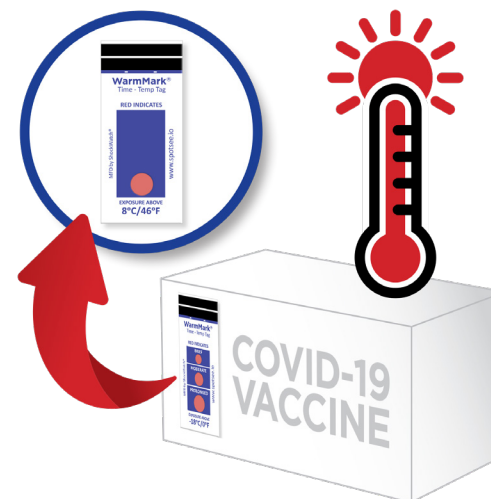
## Simple, Effective Temperature Monitoring of COVID-19 Vaccine

### Vaccine Life Declines as Temperatures and Opportunities for Failure Increase

The CDC requires diligent vaccine management to minimize waste. The COVID-19 vaccine must maintain a temperature below 8°C (refrigerated) for a limited time or else the vaccine is expected to become ineffective.

Thousands of administration sites have their own unique challenges. Doses of the COVID-19 vaccine must be thawed before patient administration. After thawing the vaccine, the clock starts ticking on the product shelf life and temperature excursions can have significant impacts on the product's efficacy and waste.

Refrigerators or coolers used to temporarily store the vaccine will be repeatedly opened and closed, coolants may not be used correctly, and people will be in a rush to get patients in and out of administration centers. All these factors lead to the real possibility of unintended temperature abuse and efficacy issues.



**BEST PRACTICE:** Place the WarmMark time-temperature indicator on each box of doses sent to administration site to monitor vaccine vials during temporary storage and the injection process. The time and temperature feature on the indicator will enable healthcare provider to know if the doses have experienced an unacceptable temperature excursion.

WarmMark technology provides clear, easy to read indication of a temperature and time duration threshold breach, so healthcare workers can be completely confident the vaccine is effective.

### No Batteries, No Infrastructure, No Worries

WarmMark indicators are highly visual and change color from white to red to indicate temperature excursions and time duration.

WarmMark indicators are low-cost, have no batteries or environmentally detrimental components, and are easy to implement with no infrastructure required. WarmMark can be easily read by non-technical staff and are perfect for one-way transport into locations where clinicians and healthcare workers simply need to know whether a vaccine has been maintained at the correct temperature.

SpotSee's WarmMark time-temperature indication can detect a range of temperatures including -18°C (deep freeze), 8°C (refrigeration), and 25°C (room temperature), and excursion times from 30 minutes to 168 hours. The indicators can also be customized for specific vaccine temperature requirements as new therapeutics are approved for use.

### Your Solution

SpotSee has been supplying cold chain indicators for over 30 years. Our WarmMark and ColdMark® brands are trusted tools in temperature monitoring around the world.

SpotSee also offers a full range of indicators and temperature data loggers and continues investing heavily in temperature monitoring technology to solve all temperature challenges of new vaccines at various stages of development and distribution.

Contact us to speak with one of our last mile consultants to see what solution is right for you. [spotsee.io/contact](https://www.spotsee.io/contact)

