ZEBRA
CAPTURE YOUR EDGE

HEATmarker® VVM — Vaccine Vial Monitors

Effective and dependable means of indicating that a vaccine has been exposed to potentially damaging heat

The cumulative exposure to temperature over time, measured by the Mean Kinetic Temperature (MKT) is critical to the quality of a vaccine. MKT is a single calculated temperature that expresses the total thermal stress that a product experiences at varying temperatures over time.

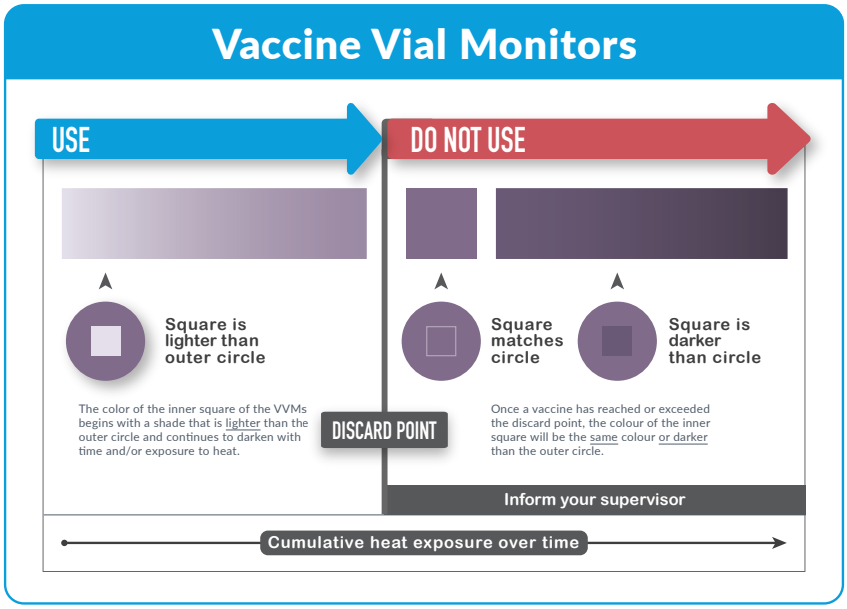
HEATmarker VVM, manufactured by Temptime Corporation, is a label containing a heat-sensitive material that is affixed to a vaccine vial, by the manufacturer, to allow for full-life heat monitoring. Since the HEATmarker VVM and the vaccine move through the supply chain together, they are exposed to the same conditions and MKT. This allows HEATmarker VVM to give health workers an overview of the cumulative heat exposure of the vaccine, and a clear indication when it has reached its time-temperature end point.

HEATmarker VVM:

- Supports efficient immunization operations
- Enables simple identification of acceptable vaccines and disposal of those that have been exposed to potentially damaging heat
- Minimizes distribution costs
- Increases flexibility in the handling of vaccines in the field

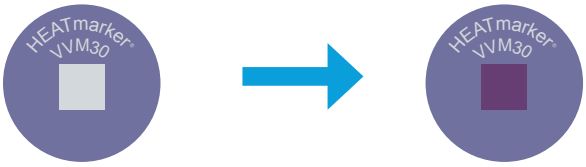
How It Works

HEATmarker VVM's appearance keeps changing over time. This gradual and continuous color change — from light to dark — shows the cumulative heat exposure of the vaccine from the time the VVM was affixed to the vaccine vial by the manufacturer, until the product is used. This helps health workers easily monitor heat exposure and preserve valuable inventory. They can confidently dispose of the vaccines that have experienced excessive thermal stress.



Heat Indication

HEATmarker VVM, manufactured by Temptime Corporation, has been used to monitor the temperature exposure of vaccines since 1996, as recommended by the WHO and UNICEF. The inner square of the VVM is made of heat-sensitive material that is initially light in color and becomes darker when exposed to heat. The color change is faster at higher temperatures and slower at lower temperatures. At the end point, the inner square is the same color as or darker than the outer circle.



before heat exposure

after excessive heat exposure

Stability Categories

HEATmarker VVMs are available in several categories based on their rate of change at the specified time (days to end point) and temperature profiles (temperature specification):

- Very high stability
- High stability
- Medium stability
- Intermediate stability
- Moderate stability
- Very low stability

Vaccine manufacturers select the appropriate category for their vaccines to ensure that the color change of the HEATmarker VVM is the best match for the heat stability of the vaccine product being monitored.

How to Select the Right HEATmarker VVM

Manufacturers identify the HEATmarker VVM that best matches the stability of the vaccine in compliance with WHO Immunization Vaccines and Biologicals specifications.

The table below is used to identify the appropriate category of HEATmarker VVM.

Vaccine stability category	HEATmarker VVM	Temperature specification	Days to end point	Shelf Life (years from date of manufacture)	Standard size
Very high		37°C	250	2	10 mm diameter
High		37°C	30	5	10 mm diameter
Medium		37°C	14	5	10 mm diameter
Intermediate		37°C	11	5	10 mm diameter
Moderate		37°C	7	4	10 mm diameter
Least		37°C	2	4	10 mm diameter

Tap into the future of temperature monitoring at www.zebra.com/tempmonitoring

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