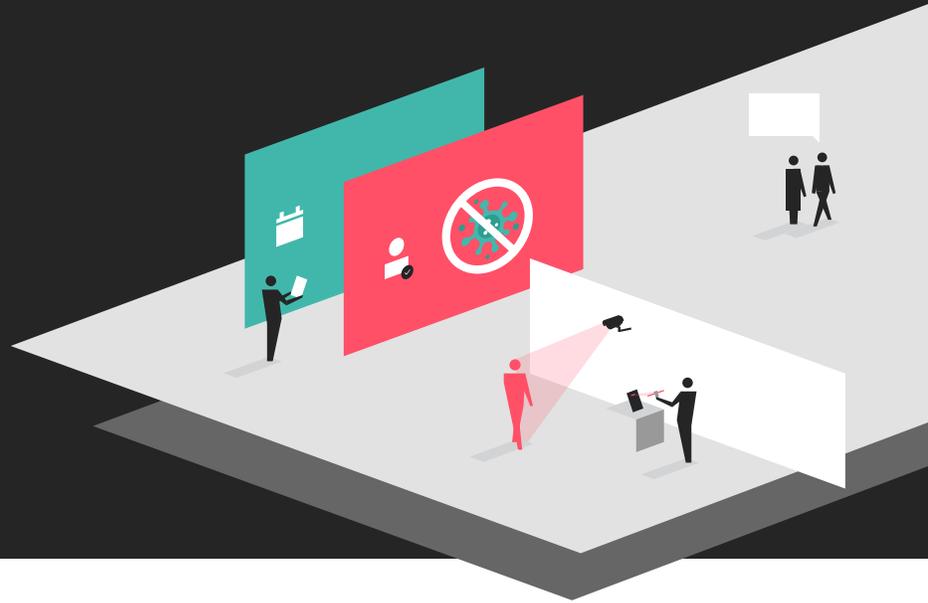


Thermal imaging considerations for employee safety.

— Industry best practices for a safe return to the workplace.



Background.

As businesses and security professionals are planning their back to the office and workplace safety playbooks, the idea of using thermal imaging equipment to detect fevers and subsequently COVID-19 is becoming a widely discussed countermeasure. The logic behind using this technology is to identify a person with a fever, drawing the assumption they could have the novel coronavirus to prevent them from entering and potentially infecting the larger employee population. There have been many essential businesses that have adopted these technologies as a tollgate to coming into their workplace. The question is - **was it an effective strategy?**

Reading temperature via thermal imaging cameras is not new. In construction thermal cameras have been used for a long time to detect issues such as water leaks and electrical shorts inside of walls. Firefighters use them to detect fires and hotspots within walls. Warehouse workers use these systems to make sure the temperature is consistent in cold storage areas.

Thermal cameras are also used in healthcare to take skin temperature readings. These cameras are designed for this purpose and have a higher degree of accuracy (and cost) than construction-grade cameras. They also require a controlled environment and don't have a high degree



of tolerance outside of those specific conditions. It's important to know that when used for this purpose, these cameras are considered a medical device and are governed by the Food and Drug Agency (FDA).

In sum, there is a difference between construction-grade and healthcare-grade

thermal cameras. It comes down to accuracy, cost and environmental sensitivity.

- Construction grade - lower cost, less accurate readings compared to healthcare, less sensitive to conditions.
- Healthcare grade - higher cost, high accuracy, requires a controlled environment, governed by FDA regulations.

Do your due diligence.

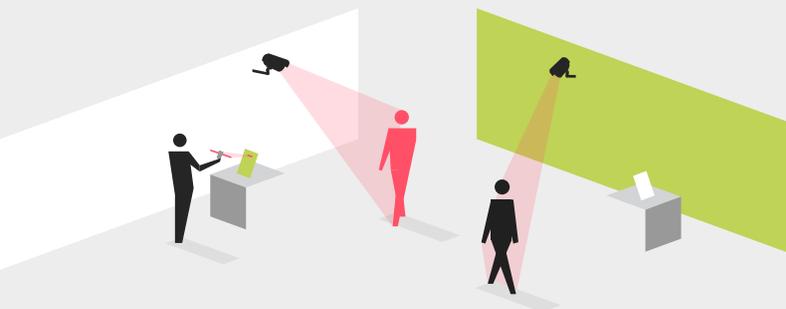
If your organization is looking into these cameras, it's important to know the underlying technology behind the marketing pitch you see upfront and the guidelines from the FDA around the use of this equipment. Many vendors have flooded the market with solutions that are not viable per FDA recommendations.

Prior to the COVID19 pandemic, [the FDA under CFR 807.81](#) required manufacturers to register their cameras with the FDA and receive clearance before they can market the product. However, during the pandemic, and because the FDA does believe these systems can be of value during this time, they "do not intend to object to the distribution of these systems" when used for initial body temperature assessment for triage use and where such decisions do not create undue risk.



What is the level of risk you're willing to accept?

It comes down to accuracy. To mitigate undue risk, these systems must meet specific performance and labeling criteria and they must be used with a secondary evaluation method when elevated body temperature is confirmed. The key criterion as part of the performance and labeling section is an accuracy rating that does not exceed $\pm 0.5^{\circ}\text{C}$ or 0.9°F . The system should include a blackbody thermal reference and only measure one subject at a time.



Understanding upfront investment.

When looking at your options it is critical to read the fine print. The first thing you should ask yourself is whether this camera is fit for skin temperature accuracy or if it is a construction grade camera being marketed inappropriately as a medical grade device. From a cost perspective, many of the construction-grade cameras cost \$1,000 or less. Most medical-grade camera technology out there is \$10,000 and upwards. Full system solutions are generally around \$30,000 per location.



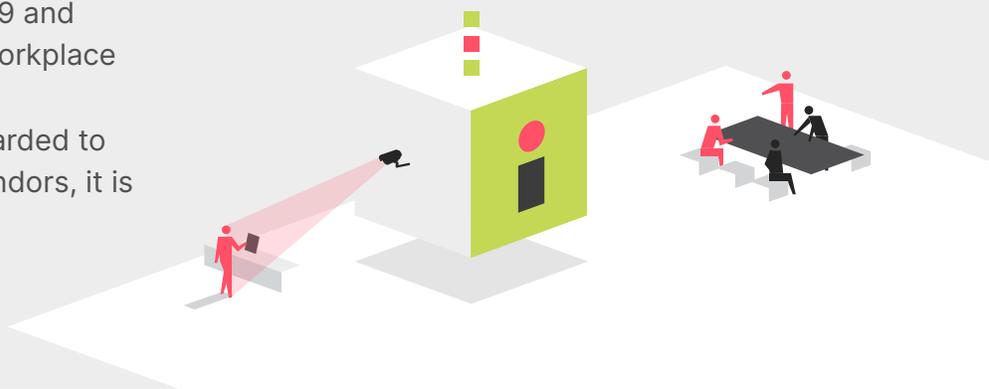
Cost, of course, is another part of your due diligence when looking at thermal imaging technologies. Security leaders have a responsibility to look at the return on investment (ROI) and measure the cost and short term need versus long term impact. In addition to the camera costs, you must also include the cost for the secondary

screening equipment, possibly equipment to control the environment, and either staff or software automation to administer the screen. Some companies are willing to make this investment purely for the sake of demonstrating they are doing everything they possibly can to eliminate the spread of this virus. Others are simply not willing to make that investment for a short term solution with questionable effectiveness.

Privacy.

Even though the Health and Human Services (HHS) has deemed checking for signs and symptoms directly related to COVID19 and sending employees home from the workplace as acceptable, this information is still health-related and should be safeguarded to the highest degree. When vetting vendors, it is

worth conducting an IT security review and privacy impact assessment to ensure these rapidly deployed technologies don't have vulnerabilities that will put you and your employees' data at risk.



Effectiveness limitations.

Further guidance from the FDA and the International Standards Organization ([ISO 13154](#)) discusses the controlled environment needed to maintain the accuracy rating of the device itself. With this in mind, you should have a plan for where you will conduct this screening before making the investment.

You must be able to regulate the ambient temperature of the room (blocking out changes from the sun). You will need to have a socially distant staging area so only one person is being screened at a time. These individuals should be free from facial coverings, beverages, etc and had no strenuous activity before the reading such as climbing sets of stairs to get to the screening area.

With a controlled environment and accurate readings, it is worth noting that this is only one of many countermeasures you should be considering. 30% to 40% of all people with the

novel coronavirus present no symptoms at all and many of those who may not have a fever as one of their symptoms. Those who are symptomatic usually have an incubation period of four to six days before they start exhibiting symptoms, but they're still able to transmit the virus during this period.

As a result, the CDC recommends you always combine temperature checks with a questionnaire, social distancing, and use of personal protective equipment (PPE). You should also keep in mind that employees may present a fever for many other reasons unrelated to COVID19 and sometimes not even for contagious diseases. This may be a sensitive topic for an employee to discuss with their employer if it is a known condition.



A comprehensive safety protocol.

As a security professional, you need to do what makes most sense for your organization. In some cases that may be thermal imaging cameras. There are several other options you can consider which the industry at large is also doing:

- CDC recommends employee screening, which includes instructing employees and visitors to take their own temperature and report back whether they have a fever or not. Typically this is captured during a pre-registration process before visitors or employees set foot on site. If a safe temperature range is met, the visit is approved and a QR code is sent that can be used to sign in into the facility. This enables the organization to capture health screening statements and provide auditable records of safety protocols.

- Another option is to contract out the entire temperature and health screening to a third party such as an occupational healthcare provider. These groups have the most accurate tools for the job, training on how to use them, and extensive experience in handling sensitive health data. They can also be a short term cost solution.
- Alternatively, you could in-source on-site screening with security officers or EHS employees trained to do the job.

Integration.

From a systems perspective, you can deploy the thermal imaging system in a standalone fashion and assign one or two employees to monitor the system, ensure subjects are following the proper protocol to get an accurate reading and handle confirmed high-temperature events.

Finally, provided you have a thermal imaging system that is online and capable, you could integrate these systems into other technologies such as a [visitor management system](#) to handle



the health screening questionnaire and temperature vetting. Although, it is still recommended to have an employee administer the system to ensure the highest degree of accuracy.

Conclusion.

Thermal cameras are rapidly gaining popularity as screening tools believed to prevent COVID transmissions. In reality limitations of technology and environmental effects keep this technology as high risk and create the safe perception of COVID prevention if used on it's own. It is critical that security teams consider a multi-faceted approach to employee safety, raising the bar for thermal camera technologies, integrating readings into central systems of record for visitor and employee sign in and consider the long-term costs of the overall solution.

Resources.

FDA - Thermography during COVID19 Pandemic

[Read more >](#)

ISO 13154 Deployment, implementation and operational guidelines

[Read more >](#)

CDC Workplaces Guidelines

[Read more >](#)

Journal of American Medical Associates COVID Screening Study

[Read more >](#)