

Application of Infrared Thermography

Electrical, Refractory and More

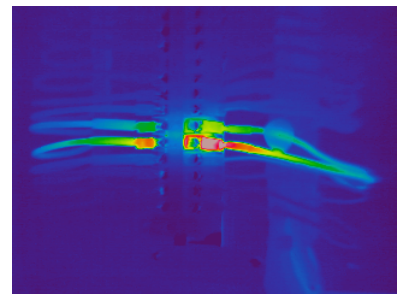
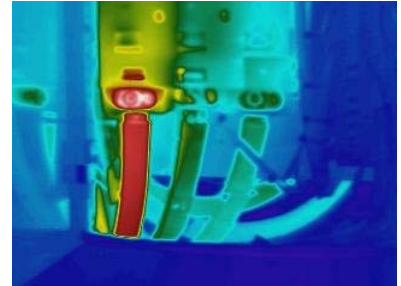
Application of IR Thermography to test electrical systems is by far the largest use of this technology with Refractory/Insulation type surveys as second. But there are many other applications to identify accurate tank levels, furnace tube and piping problems, and more.

Electrical Systems Testing

When Azima DLI performs electrical IR testing, we look at everything from the power company's high voltage substation that feeds a facility to low voltage items such as lighting/breaker panels that you would be accustomed to seeing in your own home.

Without a doubt, we spend most of our time in motor control centers (MCC's). Every industrial facility such as the companies mentioned above has dozens of these MCC buildings at their facility, which each have literally hundreds or sometimes even thousands of individual cubicles that contain the electrical components necessary to operate electrical equipment in the plant. These components would include items such as breakers, fuses, small transformers, contacts and wiring.

Components are viewed with the infrared imager to look for "hot spots". These hot spots are usually caused by loose or corroded connections but can also be generated in cases of imbalanced loads, faulty breakers, fuses, and damaged wires.



Electrical Failures

Refractory Surveys

When performing refractory type infrared surveys, we are still looking for hot spots but these hot spots are not caused by electrical current. Instead, these hot spots are caused by extreme heat generated from within the object being inspected.

An example of this would be a large steel vessel or tank with let's say a carbon steel wall thickness of $\frac{3}{4}$ of an inch. Carbon steel can only withstand temperatures up to approximately 500 degrees F. A lot of furnaces, boilers, reactors and many other type vessels can have internal temperatures in the upper hundreds and even thousands of degrees. To protect the carbon steel wall from these extreme temperatures and at the same time help provide insulation, these type vessels will be lined



Vessel Refractory Failure

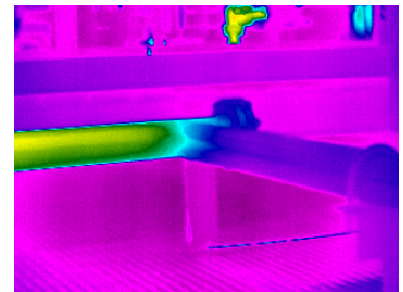
with a “refractory” brick. This brick can be anywhere from a couple to several inches thick. Here’s where the IR Thermography comes in, we can scan the exterior of these operating refractory lined vessels to look for hot spots. If we find a hot spot, it is due to the fact that the refractory brick has been damaged or even falling off the wall, leaving the carbon steel wall exposed to these extreme temperatures that it cannot withstand for long periods. Usually, operations will install a steam lance or something similar to cool down these hot spots until the vessel can be shut down and repaired.

Other Uses

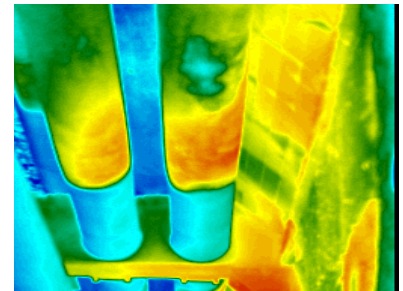
Although electrical and refractory surveys are among the most common, there are worlds of other uses for this technology. We can also use infrared thermography to survey:

- Furnace tubes for “coking”
- Rotating equipment bearings for overheating
- Detect and confirm levels in storage tanks
- Settlement or sludge buildups
- Blockage or improper valve operation in piping
- Detection of wet areas in roofs (flat type construction)
- Baseline temperature readings, such as when a new motor is installed for future temperature comparison

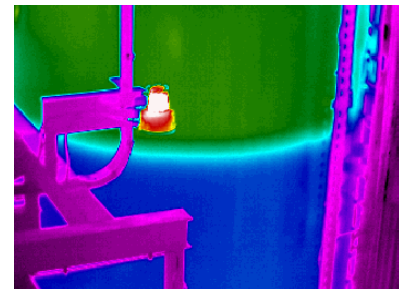
The uses are virtually unlimited, anywhere detecting the presence of heat or even cold can help in making a determination of that objects condition.



Blocked pipe



Furnace Tube Coking



Tank Levels

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