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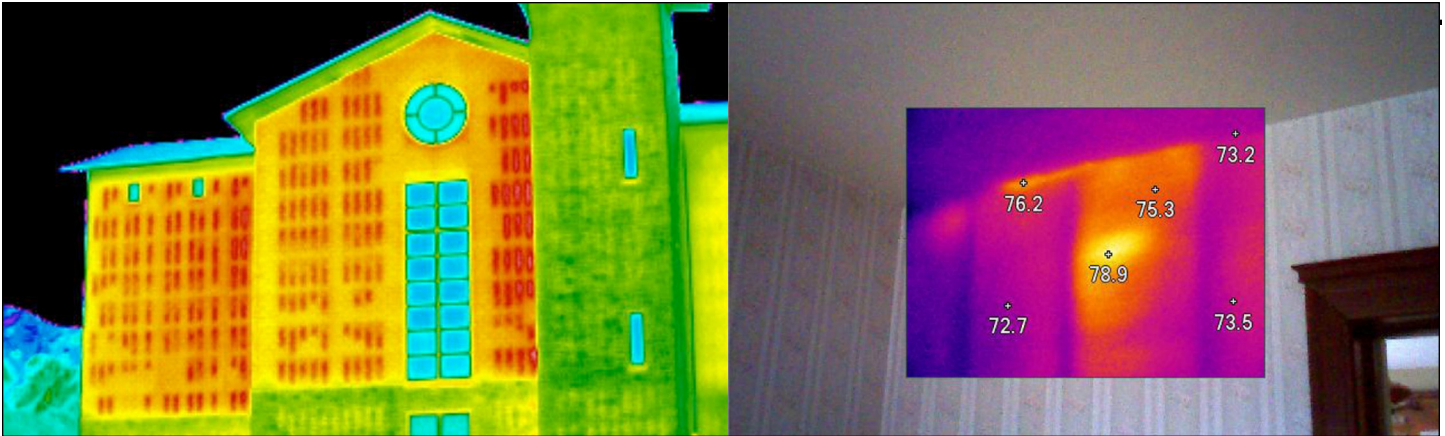
Serving The Entire Black Hills Region

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Thermal Imaging Technology

By: Patrick Breen

Thermal Imaging Technology and the use of infrared cameras was first developed by the military in the late 1950s and early 60s. Due to the high cost and sheer size of the equipment the technology during those early years was primarily reserved for military and police activity. In the early 1970s Breen & Associates invested in an infrared camera, but was cost prohibitive except for our industrial clients. Emphasis was placed on commercial/high-end electrical systems, equipment and industrial complexes.

Today, as with most new technology, the cost of infrared equipment has significantly dropped. Cameras that were large and cumbersome are now easily held in one hand. With the advent of affordable pricing, and smaller cameras, this technology is now a common tool within the home inspection industry. The application for residential structures is primarily, but not limited to, helping detect hidden water leaks, areas of air infiltration and the thermal integrity of exterior walls.

The basic physics is based on surface temperature differentials. Because an infrared camera can 'see' areas of missing insulation in exterior walls it is sometimes mistaken to have some kind of x-ray capability. Unfortunately, this is not the case. The infrared camera has a lens that is coated with a mineral called germanium. This is a substance that is similar to the silicon used in semiconductors, but is much more expensive. It has a dark, shiny/metallic property that makes the camera lens opaque to the visible light spectrum. As you can imagine the expense along with the difficulty in coating lenses was one of the hurdles in bringing infrared technology into common applications.

Simply put, instead of having a camera with a lens that magnifies and focuses clear visible imagery, the lens blocks all visible light and allows only the wavelengths of thermal radiation to reach the camera sensors. Instead of having a clear picture of what our eyes can see, we have an image of what a thermometer would see.

All materials conduct, radiate and emit thermal energy differently. It is these differences that create the picture in an infrared camera. If you were to hold a piece of steel and piece of wood over an open flame you would quickly discover these three differences in those two materials.

The value in all this to a homeowner is that in the hands of a certified thermographer this tool can help determine and verify issues within a home. Because water conducts and radiates heat differently than wood or gypsum, a thermal camera can help locate or discover a pesky water leak. Air entering or exiting a house has a different temperature than the structure, so locations of air infiltration can more easily be determined. If you suspect poor insulation the camera can 'see' voids in the walls. If you want to locate hidden pipes, buried under ground or inside a wall, an infrared camera just might be able to help.