

**Infrared Cameras Reveal
Source and Scope of
Building Water Damage and Mold**

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Over the past few years the number of negligence law suits brought by homeowners and commercial tenants against building owners and managers and their insurers claiming personal injury and/or property damage from mold has exploded. Mold requires moisture to grow. Infrared (IR) thermography, also called thermal imaging, can instantly detect moisture in building materials. Widely used in military, law enforcement, industry, and research and development applications, IR cameras are becoming a powerful asset in the fight against mold, significantly reducing the time, cost, and uncertainty for attorneys and their clients of establishing the extent of and liability for water intrusion, and thus likely areas of mold contamination.

The U.S. Chamber of Commerce reported that in 2003 there were more than 10,000 mold case pending nationwide , a 300 percent increase over 1999¹, and the Insurance Information Institute estimates that settlements for mold related claims went from virtually non-existent to \$3 billion during the same period². Our firm alone has over 750 active mold and water damage cases, and receives about 100 inquiries a week on new ones. In the northern California area alone, the number of law firms handling mold cases has shot from two, ourselves and one other, to 2000.

¹ . News release, U.S. Chamber of Commerce, dtd 7/17/03.

² . Robert Hartwig, Chief Economist, Insurance Information Institute, a New York-based industry group.

The increase has in part been spurred by several highly visibility large settlements: the Ballard case in Texas and in California, our own Mazza case and cases involving the homes of TV personalities Ed McMahon and most recently, Lou "The Hulk" Ferrigno³. In the Mazza case, the first, and to date only successful mold personal injury suit decided by a jury – all others have been settled prior to trial – the plaintiffs received \$2.7 million plus our fees and court costs for injuries allegedly caused by mold exposure. The sheer number of claims that were generated effectively paralyzed the insurance industry, especially here in California, as anyone who ever stubbed their toe on a mold spore started filing a claim.

As a result, insurance companies across the country are adding riders to their homeowners policies, specifically excluding coverage for personal injury resulting from mold. Homeowners, apartment tenants and many businesses, such as hotels and motels, also not covered, have started suing for negligence, leaving builders, contractors and rental and commercial business building owners and managers and their insurance carriers highly vulnerable to litigation.

To be successful, both sides need the ability to conclusively prove or disprove responsibility for water intrusion, a prerequisite for mold growth in buildings. But until recently, proving or disproving the root cause of the invasive moisture has been time consuming, expensive and often inconclusive. The process of finding the source of the moisture intrusion has combined visual inspection, field experience in locating intrusive moisture, the use of contact moisture meters and tearing out walls and ceilings.

Now, however, the availability of small, affordable infrared (IR) cameras has dramatically facilitated the task of detecting moisture and tracing its source. Our contractors' FLIR infrared cameras have saved us tens of thousands of dollars in the less than a year we've employed them by quickly and inexpensively giving us the evidence to decide which cases to pursue, and then, gathering the proof to win them. Infrared helps us distinguish immediately between a good case and a bad case, and that alone has saved perhaps \$10,000 to \$15,000 per case in time and labor costs for tearing up walls and other destructive testing by telling us where to spend our money and our client's and where not to.

I was first exposed to infrared building diagnostics by a contractor to whom I lamented about a case where a family had lost everything at trial because we couldn't prove where the water had come from. And he said, 'Boy, there is this new infrared technology out there which will help us track it and map it quickly, instead of going through a \$600,000 case all the way through trial, and losing.'

³ .Ballard v Farmers Insurance Exchange; Darren Mazza et al v Raymond Schultz et al; McMahon v American Equity Insurance Co. et al; Ferrigno v Mercury Insurance Co,

When construction defect attorneys are involved in a claim of substance, you usually have about 15 other lawyers representing the various different trades. And that means is that everyone is finger pointing. With an IR camera you can achieve clarity quickly in terms of who's liable for a water intrusion problem.

Prior to infrared, in construction defect cases in which we represented a homeowner, for example, we would go on-site and investigate. Basically, we would look and see what came out of a wall or ceiling. Then we would make a claim to the other side, and hire six or seven get experts to come, because you cannot destroy evidence through destructive testing without the other side agreeing to it, or being present to see what you do. That whole process used to take three to four months, cost more than \$10,000 and burn a lot of lawyer time. The biggest problem was that you didn't even know if you had a case yet until you opened the wall, and if you didn't, you still paid for resealing the wall.

Now we send our local contractor with an infrared camera to qualify the case as good or bad, and within a week actually have evidence without any destruction whatsoever. That will often lead to a settlement of the claim within weeks. You should see the opposing counsels' faces after they argue that there is no problem, and I show them digital photographs of the water shooting down the walls from the inside.

Recently, I had a case involving a commercial building in which there were severe leaks coming in through the walls as a result of faulty construction. The person who provided the curtain wall construction system blamed the roof, which of course was not under his aegis. With the IR camera we were able to see that the water leak started in the middle of the wall. There was no contribution from the roof on the thermal image. So the infrared camera provided evidence that disproved everything the other side had to say, and we didn't have to tear the building down to prove it.

When I'm in the position of having to defend somebody who is alleged to be responsible for the problem in a building, we use an IR camera to validate the problem. If we validate the claim with IR, we can resolve the matter quickly. We don't have an argument about liability, so we save attorney's fees and expert costs in the process for our client. On the other hand, if the camera invalidates the claim, we can knock the plaintiff out by the legs immediately, again saving experts' and lawyers' fees for our client.

Infrared thermal imaging also can have a critical role in health safety. Some of our clients come to us in a state of poor health. They don't even have clean clothes, because it's all been contaminated in their home and they don't know where to go. We need to know immediately whether they have a life safety or health safety issue in their house, or whether it's at some other dwelling, or office that they've been exposed to.

With the IR camera we can quickly investigate and immediately show them tangible results at their house. The result is that they can make a decision whether to move out or not based on facts.

Sidebar:

How Infrared Thermography Works

Thermography enables us to see and measure heat. All materials on earth emit heat energy, in the infrared portion of the spectrum. Unfortunately, the unaided human eye cannot see in the infrared. However, infrared cameras can not only see, but also record infrared images and measure the temperatures of objects and areas of objects quite accurately. Real-time imaging allows the user to see the infrared image displayed as the camera is moved, like a viewfinder.

Thermography can pinpoint leaks in roofing and other building materials by exploiting the thermal properties of water. Water stores heat very well; it warms up or cools down more slowly than other materials common in buildings. This property is called “specific heat” by physicists (*Table 1*).

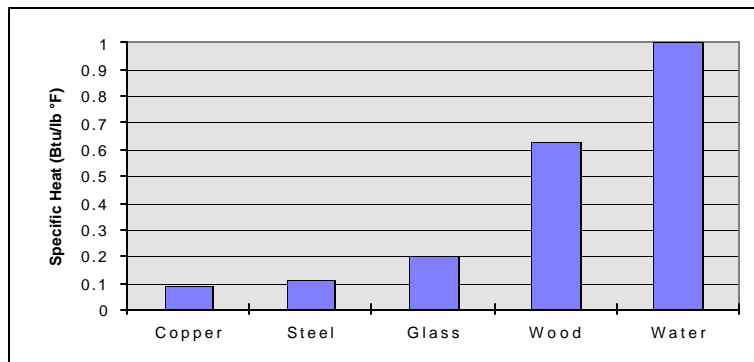


TABLE 1. Specific heat of various substances. The greater its specific heat, the more energy is required to heat or cool a particular material. Water has a much higher specific heat than wood and subsequently cools down or heats up much more slowly than wood under similar conditions. This difference in temperature can be imaged and measured using an IR camera.

Thermography measures and compares the temperatures of building materials that are wet— -- presumably from leaks --, and materials that are dry. On a flat roof, after sunset the wet areas retain the heat absorbed during the day longer than the surrounding dry areas, causing a temperature difference that can be imaged. IR can also be used to inspect the underside of roof decks, a highly effective approach when working with metal and ballasted roofing systems, which are difficult or impossible to inspect from above.

Wet areas of interior building walls, ceilings, and floors on the other hand, cool as the water evaporates. Typically, such wet areas can be 3 to 6 Fahrenheit degrees cooler than similar dry

materials. They are easily imaged with currently available IR cameras, which can discern temperature differences down to 1/10 of a Fahrenheit degree.

Recent advances in core technologies have enabled at least one manufacturer, FLIR Systems, to offer high-performance IR cameras that weigh only 1½ pounds at lower prices than ever before, plus software that can generate reports literally with the click of a mouse. As a result, the use of IR as a building diagnostic tool to pinpoint interior water damage and such moisture-related problems as mold, structural defects, and insect infestation quickly, accurately and non-invasively has increased dramatically.

Ceiling scan photo and image:

Infrared color thermal image clearly shows moisture intrusion, a potential source of mold growth, in corner of ceiling. New FLIR ThermaCAM® B-Series of infrared cameras, specifically designed for building inspection, can instantly and non-invasively detect moisture and structural problems. High-resolution B1 shown is a rugged, ultra-compact and affordable model that can instantaneously inspect entire rooms — including places that are difficult to reach. All B-series cameras store JPEG images which can be easily downloaded to a PC, and support software that can generate reports literally with the click of a mouse.



