

The Cooler Solution

The dangers of the quartz halogen work light are well known: They can heat up to more than 570 degrees Fahrenheit, hot enough to ignite paper and wood

BY BRIAN ASTL



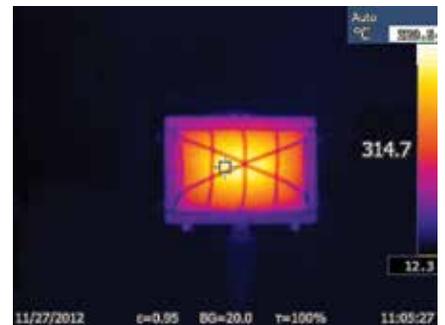
The ubiquitous 500W Quartz Halogen work light

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The 500W quartz halogen portable work light is everywhere, and why not? They are cheap, easily moved, and they put out a lot of light to help you work in an area. And while they come in a couple of different styles (on tripods, floor stands, or magnet mounts), at their core they are all the same: dangerous tools that harm workers, start fires, and set off explosions. In our experience working with contractors, electricians, and plant workers, we hear the same complaint everywhere we go: Quartz halogen lights are too hot, and people are getting hurt.

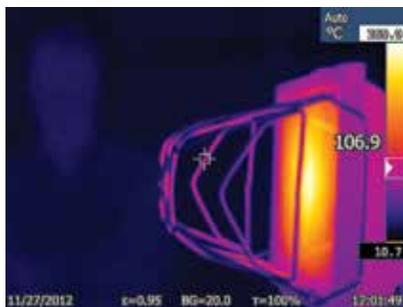
A look at the data reveals why everyone is complaining. We measured a 500W quartz halogen portable work light using an infrared camera for more than four hours. What we found was that within the first hour, the 500W quartz halogen had already reached its maximum temperature of more than 300 degrees Celsius (>570 F). This temperature will ignite paper and wood. It is the melting point of pewter. Styrofoam will become liquid at this temperature. We haven't even begun to discuss what this would do to human flesh.

Below is an infrared picture of the 500W quartz halogen light after one hour. The different colors represent the varying temperature levels in the picture. In the upper right corner, you can see the maximum temperature present in the picture. In this case, it's the 329 degrees C number that represents the hottest point on the 500W quartz halogen light. The number in the middle right represents the temperature at the point where the crosshairs are situated. In this case, 314 degrees Celsius is somewhere near the middle of the light.



A 500W Quartz Halogen work light under IR imaging

We found that even the guard that is meant to protect the user from the hottest part of the light reached temperatures above 212 degrees F.



Protective grill on a 500W Quartz Halogen work light registers over 100C/212F

When we think about touching this with our hands or any other part of our bodies, that's when the real danger of a heat source like this becomes apparent. Skin will burn at about 100 C (212 F), which means that the 500W quartz halogen is an imminent and immediate danger just by being in the same room with it. When we analyzed the infrared images closely, we found that even the guard that is meant to protect the user from the hottest part of the light reached temperatures above 100 C (212 F). You can see this in picture below: The crosshairs are centered over one of the guard wires, and the number in the middle right of the screen shows 106 degrees Celsius. Therefore, there is no safe spot to touch a quartz halogen light once it has been powered up for any reasonable length of time.

Alternative Work Lights

The additional danger of using a light that becomes this hot is that it is a fire hazard. Many types of flammables, including common gasoline, will ignite at temperatures less than what the quartz halogen can produce. One of our customers told us a story about a quartz halogen light's being left out overnight and burning through the wood planks on a scaffold. In the morning, they found the light burning through its second set of planks a full story down from where it was left the night before.

Stories like this are not uncommon, and that customer was simply lucky that the quartz halogen light didn't start a broader fire. Another customer of ours tells the story of a quartz halogen light being wrapped in a fire blanket and, because

the light was so hot, the fire blanket began to smolder and smoke.

Why do workers continue to use a light that is clearly dangerous? The answer is that, until now, they rarely had other choices. As mentioned earlier, the 500W quartz halogen light gives off a lot of light and is small and portable. These advantages made it popular and the costs dropped dramatically, so that it became ubiquitous. Everyone knew they were dangerous but put up with the dangers because there were no other options that could give off that much light in such a small, portable unit. However, now there are alternative technologies on the marketplace that are attracting considerable attention.

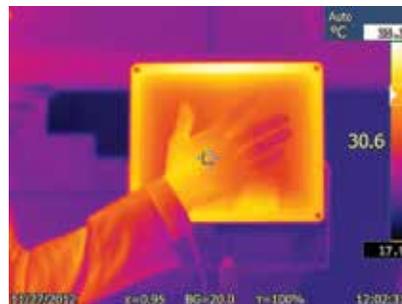
For example, LED technology has developed to the point where an LED floodlight can give off the same useable light as a 500W quartz halogen with none of the downside risks.

At this point, most people are quite familiar with the concept of LEDs. They never require bulb changes, are much more energy efficient than other lighting technologies, and are cool running. The last benefit tends to be overplayed, as LEDs can generate heat. But even with a moderate amount of heat sink design, an LED light will come nowhere close to the heat generated by a 500W quartz halogen light.

A look at the data will once again help to inform this argument. We ran a 500W quartz halogen work light side by side with a 50W LED portable floodlight. The 50W LED floodlight gives off the same amount of useable light in the same light flooding pattern, so it is an excellent unit for an "apples to apples" comparison. The lights were left to run, and periodic infrared readings were taken of both lights to compare their operating temperatures.

Like the quartz halogen light in our first test mentioned above, the 50W LED portable floodlight reached its maximum temperature in under an hour. However, unlike the quartz halogen light, the 50W LED portable floodlight continued to operate in a temperature range that was not dangerous and could not start a fire. The maximum temperature of the LED light

was just about 35 degrees Celsius (95 F). It's of interest to note that the temperature reading of a human hand is just below 31 C (89 F), meaning the LED floodlight was only slightly warmer than a firm handshake. In the image below, you can see the maximum temperature in the upper right (35.3 C) and the temperature of the hand where the crosshairs are pointed at the middle right (30.6 C).



A 50W LED Portable Flood Light under IR imaging

When viewed together using a composite visual and IR image, the LED floodlight IR signature almost disappears due to the extreme heat of the quartz halogen on the left.



Side by side IR comparison of quartz halogen and LED flood lights

The advancement of LED lighting technology is a game changer that will save lives and reduce injuries in the work place, let alone dramatically reduce energy usage and downtime associated with bulb replacement. Perhaps now that workers finally have a choice for a bright, portable work light, they will make the decision to stay away from lights that send them home with serious burns. **OKS**

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