WHAT IS INFRARED TECHNOLOGY?

Infrared technology is increasingly present in mainstream industrial applications. Before asking 'what is infrared technology?', we need to clarify our understanding of infrared radiation. Visible 'light' accounts for a tiny amount of the radiation that exists around us, our eyes are only capable of seeing a narrow region of the electromagnetic spectrum, and we need specialist technology to see what lies beyond. Microwaves, radio waves, ultraviolet rays, and infrared are all forms of radiation that's invisible to us, but their presence is felt nevertheless, largely through radiated heat. We use protective cream for example, to protect us against the sun's harmful UV rays, and x-rays (a high energy, short wavelength radiation) are used extensively to penetrate our skin and reveal fractures in bone in a way that's not possible by visible light.

Infrared, meaning 'below red', is radiation similar to visible light, but with a slightly longer wavelength. It has less energy than red light - which is the lowest energy light the human eye can perceive. Whilst visible light is emitted by objects at a very high temperature, infrared energy is emitted by all objects at room temperature and below. Now, all objects have the ability to absorb and emit radiated heat, but at different values. Dull and dark objects such as concrete and rubber, for example, will retain and emit more heat under identical conditions than reflective objects like steel. But generally, the hotter the object, the greater the amount of infrared energy is emitted. The human body emits a vast amount of heat that's difficult to perceive without specialist infrared technology.

Let's consider measuring this emitted heat…

By using sophisticated technology, we can detect emitted infrared energy. Taking the human body as an example, infrared thermal image cameras can detect our infrared heat signature in total darkness. You may have seen an image taken by a police helicopter camera of suspects on the run at night, showing the hottest areas as bright white, typically being car tyres, street lighting, or human skin. Thermal imaging systems not only let you see in the dark, but they also enhance your ability to detect excessive or inadequate temperatures of critical objects, assess energy loss and protect the environment, and evaluate building diagnostics. They are an invaluable, affordable tool for businesses specialising in transportation, construction, environmental monitoring, electrical installation, and security.

Click here to watch a few short videos explaining how infrared thermal imaging cameras could bring huge increases in efficiency to your business.

An alternative to the infrared thermal image camera is the infrared thermometer. These thermometers use sophisticated optics to measure radiated heat. Often being equipped with a laser, they are designed for instant non-contact temperature measurements of inaccessible, hygienic, or hard-to-reach flat surface areas, such as air conditioning systems, industrial machinery, automotive spot checks, and food preparation surfaces.

When it comes to using an infrared thermometer, most suppliers would have you believe it's simply a question of pointing the laser; pulling the trigger, and reading the temperature measurement. It's really not that simple to achieve an accurate measurement. Important factors to consider before measuring are laser spot-size, and the emissivity value of the surface being measured. The error in the accuracy of a measured value can be as much as 30% of the reading just based on emissivity.

Click here to watch a video explaining how to combat the effects of emissivity on your measurement.

Calibrating Your Instruments

If you can choose the technology best suited to your intended application, AND provide traceable instrument calibration to an auditor, you can always be assured of your measurement's creditability. If you're unsure of an instrument's suitability, always consult the help of a professional body.

ATP Instrumentation has a wide range of infrared technology available designed to suit your individual requirements. If you have a technical query, please call us now on 01530 566800, and we'll refer you to our instrument technical team.