

## Infrared Thermometer Accuracy & Calibration

Unlike standard contact probe-type thermometers, [Infrared \(IR\) thermometers](#) do not directly measure the temperature but instead measure the reflected light at specific wave lengths. As the reflectance or emissivity of a surface can vary depending on the material, finish and even temperature this makes calibration of an IR thermometer a tricky proposition. If a surface has an emissivity of 0.95 (typical of cardboard) and the unit is certified at 0.95 emissivity then that means it is accurate for surfaces of 0.95 emissivity but may be off significantly if the product measured has a different emissivity. So, at 0.95 it may be good for cardboard boxes, but less than ideal on stainless steel, ice or fresh meat. This explains why cheap 0.95 units are prevalent in shipping areas but a problem in many production areas. In shipping it is usually boxes being checked, whereas in production the products and materials to be measured vary significantly. [Scigiene Food inspector \(FI series\) Infrared thermometers](#) actually use a fixed emissivity of 0.97 as this is better for most food products.

### So how do you check /calibrate your IR thermometer?

**Option A:** Take the surface temperature of the object to be typically measured using a surface probe and ensure it is in a stable temperature environment. Once the thermometer reading has stabilized take a reading and then quickly point the IR thermometer at close range (a few cm away) at the same spot and take a reading. Adjust the emissivity until it reads correctly. While this method is okay, the error can easily be off by over by +/-2.0C and not all models have adjustable emissivity.



**Option B:** For fixed emissivity units. With our dual IR/Thermocouple models [HACCP Auditor I.R.](#), [HACCP Auditor I.R. Plus HACCP Thermometer with built-in K-type Thermocouple](#), and Scigiene [Food inspector with folding probe](#) we suggest that you check the unit using our [SCCAL-IR1 Infrared Comparator](#). The Scigiene IR comparator allows you to verify accuracy to +/-0.5C. Its low cost and ease of use means it can be used daily for fast validation of I.R. thermometers and to determine if there are any underlying damages or inaccuracies to the infra-red thermometer itself. The SCCAL-IR1 is the world's most accurate Infrared Comparator because it utilizes Scigiene's proprietary Thermal Barrier technology and sealed I.R. chamber to create an I.R. reference plate that is more stable than even blackbody devices.



The [SCCAL-IR1 Infrared Comparator](#) is used at ambient temperatures and incorporates a [reference thermometer](#) to take precision temperature readings. The comparator should be placed in a stable temperature room and the MIN/Max readings on the Reference thermometer should be used to confirm temperatures have been stable for about 5 minutes. You should also place the infra-red thermometer that is going to be tested with the comparator in the same room to allow the electronics within the thermometer to stabilize. Sudden temperature fluctuations of the infra-red thermometer can lead to temperature variations up to 10C. You will place your IR thermometer on the comparator as instructed and compare the value to the Reference thermometer. By comparing the readings, you will be able to determine the accuracy of all your Scigien Food Inspector Infrared Thermometers to within +/-0.5C.

