

# Asphalt Temperature Measurement in Road Laying

## using the PyroCouple infrared temperature sensor

The PyroCouple Series of infrared temperature sensors is ideal for measuring the temperature of the road surface before and after tarmac is laid.

Tarmac must be compacted while it is still hot to ensure a minimum of air voids for maximum density and strength. If tarmac is too cold when it is laid, then it cannot be fully compacted, resulting in a weak road surface.

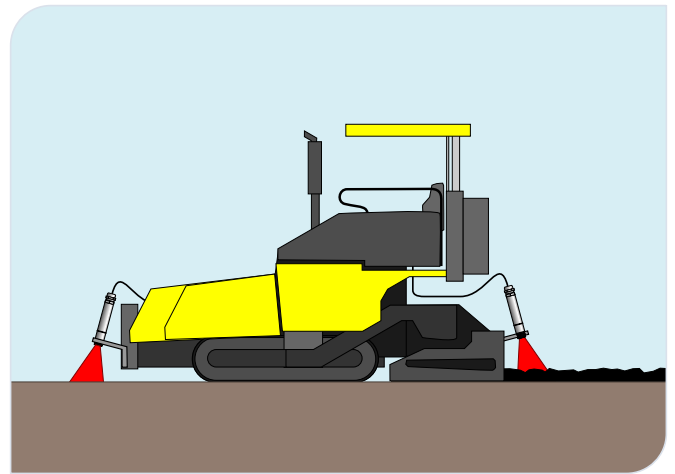
Monitoring the temperature of the surface with a sensor on the paver vehicle after laying the tarmac helps ensure that the temperature is high enough.

The temperature of the road surface is also monitored before the tarmac is laid. This helps predict how much time will be available to compact the surface before it has cooled, and ensure the tarmac in the vehicle is hot enough.

If there is metalwork on the vehicle that could obstruct the sensor's vision, relatively narrow optics should be chosen so that only the road surface is being measured. A sensor with 15:1 optics usually provide a narrow enough field of view at a low cost.

As the tarmac is laid its temperature is typically between 95°C and 190°C, and the minimum rolling temperature is usually above 75°C.

These optical and temperature considerations mean PyroCouple model PC151MT-0 is usually best suited to this application. It has a 4-20 mA output that can be fed into existing instrumentation, or Calex can provide a simple, low-cost indicator.



Two model PC151MT-0 sensors are mounted on the paver and aimed at the road surface, before and after laying the tarmac. A sensor can also be placed on the roller to monitor the tarmac temperature immediately before it is compacted.



PyroCouple sensor, model PC151MT-0



PyroCouple with air purge collar, model APSN

### APPLICATION TIPS

The emissivity of road surface materials is typically very high so it is easy to get good results with a fixed-emissivity sensor. This is also true when measuring the surface temperature of a bond or tack coat.

Calex sensors are designed to be used indoors, so as this is an outdoor application the sensors should be sheltered from the weather and from being heated by direct sunlight. They may be used where ambient temperatures are between 0°C and 70°C.

In this application, there is the possibility for condensation and dirt to settle on the lens and, as with any infrared temperature sensor, this could affect the reading. If this becomes an issue, then an air purge collar may be added to help keep the lens clean and dry.

### SIMILAR APPLICATIONS

If tarmac is kept at too high a temperature, and for too long, the ability of the bitumen to bind the mixture will degrade. It is important to monitor temperatures for each course of bituminous mixture, at all stages from mixing to compacting. Temperatures may be checked with a handheld infrared thermometer or continuously monitored with a low-cost fixed sensor.

Infrared sensors are also used to measure the temperature of the asphalt stream as it is poured from a mixer into a vehicle, to ensure it will still be hot enough by the time it is laid. A PyroMini sensor with narrow optics may be used; the data logging features of the PyroMini provide traceability.