

Non-Contact Measurements in Tyre Manufacturing

using the PyroCouple infrared temperature sensor

Infrared temperature sensors from the Callex PyroCouple Series are being used by a major tyre manufacturer to detect the presence of hot rubber tyre material as it passes a point on a conveyor.

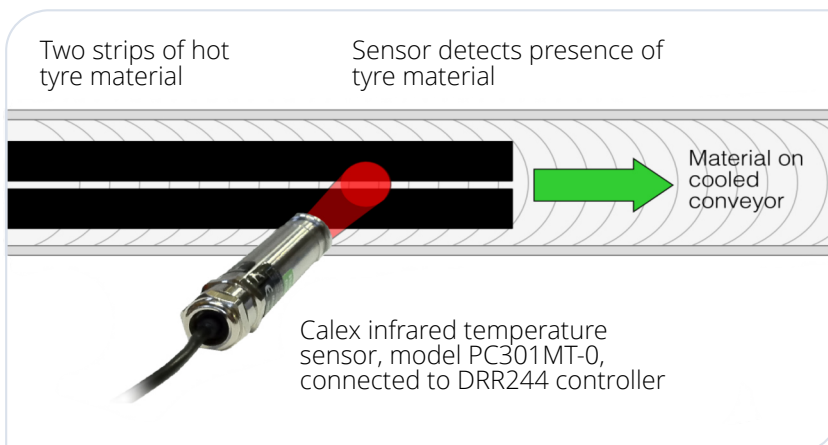
The tyre material is transported in two thin bands on a cooled aluminium conveyor. A Callex PyroCouple model PC301MT-0 infrared temperature sensor is positioned above the conveyor, and is aimed so that both bands are contained in its field of view.

The temperature of the tyre material is normally 75°C and the cooled conveyor surface temperature is typically 20°C.

The sensor is connected to a DIN rail-mounted controller with a relay output that will switch at a chosen measured temperature (e.g. about 45°C).

The relay setpoint temperature is low enough that the relay will be triggered reliably despite the tyre material not completely filling the sensor's field of view. The system can therefore detect the presence of the tyre material, and the time that the material starts and stops being present can be logged.

Speed data from the conveyor drive system is combined with the timings from the sensor and the total length of tyre material passing the sensor can be calculated over each manufacturing period.



APPLICATION TIPS

This system can also be used to detect the presence of a single band of product. If the sensor's field of view is completely filled by the tyre material, then the temperature reading will also be accurate.

Tyre rubber has a high emissivity, so the low-cost, fixed-emissivity PyroCouple Series of infrared temperature sensors is perfectly suitable. For other materials, please contact Callex for advice on the most suitable sensor.

The sensor measures an average temperature across its field of view. Because the sensor can also "see" the cool conveyor as well as the hot tyre material, the measured temperature will be lower than the true temperature of the tyre material, however the reading is sufficiently accurate that the sensor may be used to detect whether or not it is present.

The DRR244 DIN rail-mounted controller will indicate the measured temperature and the setpoint temperature, and can also be configured to retransmit the measured temperature as a linear 0-10 V DC or 4-20 mA signal for connection to a data logger or instrumentation. It has another relay output that can be configured for control or alarm.

For more information, advice on choosing the most suitable sensor for your application, and for a quotation, please do not hesitate to contact Callex.

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