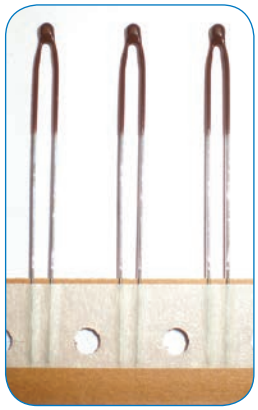
CR1 – A Breakthrough in Thermistor Coating for Harsh Environment Applications



What distinguishes the CR1 from other available coatings?

Conventional coatings for environmental protection and insulation of thermistors are usually a compromise in terms of performance.

Epoxy encapsulation gives good thermal shock properties and corrosion resistance but low flexibility, limited temperature performance and slow time response.

Silicone coatings, by contrast, perform well up to 200°C, are flexible and allow tight dimensional control for fast time response. They, however, are limited in their thermal shock performance and resistance to acids.

The use of CR1 in the current innovation overcomes these limitations and addresses a need for improved protection for temperature sensors in harsh environments, such as Euro 6 compliant emission reduction systems in diesel engines.

Technical Advantages of CR1:

Chemical resistance in harsh environments is one of the fundamental performance advantages of CR1. The coating is resistant to a wide range of acids, fuels, solvents and moisture. Heat resistance up to ~300°C is possible although the part is usually limited by the melting point of the solder used to attach lead wires to the thermistor.

A proprietary Amphenol Advanced Sensors process allows the polymer to exceed the voltage standoff requirement for automotive sensors, with associated advantages for coating thickness reduction. Coating with CR1 allows accurate dimensional control of the coated thermistor giving fast thermal time response. The tensile strength of CR1 [>4x that of silicone] extends thermal shock performance and ensures good mechanical integrity of the thermistor chip package.

For example, when overmolding or inserting into a sensor housing, mechanical flexibility enables the thermistor lead wires to be formed once the protective coating has been applied. The low level of porosity in the polymer structure gives good moisture resistance, which is important for applications where condensation or high humidity are present, such as air conditioning condenser units.

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Benefits of CR1 Coating:

- Tested to AEC Q200 (Material 4A Types)
- Resistant to Acid/Gasoline/Diesel/Biofuel/Urea
- High temperature performance up to 190°C
- High thermal shock resistance
- Water immersion, silver migration resistance
- Insulation up to 1000V DC at 25°C
- Flexibility 180° bend around 1mm mandrel

Economic Advantages of CR1 Coating:

- A alternative to glass-encapsulated devices by solving glass/metal interface corrosion issues
- May be exposed to corrosive environments where over-moulding or potting of standard sensors is normally required
- Automated production process using established coating technology minimizes cost and ensures product quality through 100% digital image inspection

Amphenol
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