THERMOMETRICS
A COMMITMENT TO EXCELLENCE

Application Spotlight

Thermistor Stability Benchmarking (4)

Automotive Oil, Coolant, and Water Temperature Sensors

** Typical Tolerance: ±1.1°C at 90°C*

** Accuracy/stability is required for engine efficiency.*

What are the application implications of reduced stability thermistors?

- Reduced engine performance, component reliability, lifetime of gasket and seals. If a thermistor drifts high resistance, the engine potentially operates at a high temperature.
- Losing operating efficiency. If a thermistor drifts low resistance, the engine potentially operates at a lower than optimal temperature.
- Exceeds emissions regulations.
- Cooling fans not operating when the engine requires additional cooling, leading to engine overheat.
- Increased fuel consumption. Incorrect fuel mix ratio demand from engine management system due to incorrect engine management temperature inputs.

Thermal Shock of Resin-Coated Thermistors (-40°C/15mins - +150°C/15mins, 1000 cycles)

Supplier	Δ R25 %	Δ °C	Visual Defect	Performance Ranking
Amphenol	-0.06	0.014	0	1
A	0.82	0.187	19/20 cracked; 1/20 resin spalling	2
B	0.84	0.193	20/20 cracked	3
C	1.44	0.328	20/20 cracked	4
D	2.79	0.636	8/20 crack; 18/20 resin spalling	5
E	4.55	1.037	20/20 resin spalling	6
F	7.57	1.726	20/20 resin spalling	7

AAS Advantage

- Amphenol NTC devices have robust performance under thermal cycles, showing measurement accuracy change 0.014°C at 25°C, without damage after 1000 cycles in accelerated tests.
- Amphenol resin-coated devices have excellent stability performance at elevated temperature 150°C, showing 0.04% resistance shift, equivalent measurement accuracy change 0.009°C at 25°C, and 0.013°C at 90°C after 1000 hours.

Temperature Stability of Resin-Coated Thermistors

Temperature Stability @ 100°C for 1000 Hours			
Supplier	Δ R25%	Δ °C	Performance Ranking
Amphenol	**0.04**	**0.009**	**1**
A	-0.15	0.034	2
B	2.86	0.652	3
C	2.89	0.659	4
D	2.91	0.663	5
E	2.93	0.668	6
F	8.72	1.988	7

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