

# THERMOCOUPLES VS RTD'S

The following chart indicates some inherent advantages and disadvantages of RTD's or thermocouples.

	THERMOCOUPLE	RTD'S
<b>Accuracy</b>	Limits of error wider than RTD	Limits of error smaller than thermocouples
<b>Ruggedness</b>	Excellent	Sensitive to strain, shock, and pressure
<b>Temperature</b>	-400° to 4200°F	-200° to 1500° F
<b>Size</b>	Can be as small as .01" sheath material, tip sensitive	Size limited to 1/16", temperature sensitive for length of bulb
<b>Drift</b>	Should be checked periodically, higher than RTD's	0.01 to 0.1°C per year, less drift than thermocouple
<b>Resolution</b>	Must resolve millivolts per degree, lower signal to noise ratio	Ohms per degree, much higher signal to noise ratio than thermocouple
<b>Cold Junction Reference</b>	Required	Not required
<b>Lead wire</b>	Must match lead wire calibration to thermocouple calibration	Can use copper lead wire for extension wire
<b>Response</b>	Can be made small enough for millisecond response time	Thermal mass restricts time to seconds or more
<b>Cost</b>	Low	Higher than thermocouples

Why a 3 minute egg in Denver, Colorado is softer than a 3 minute egg in Denver, North Carolina.

BOILING POINT OF WATER					
ALTITUDE FT	B>P> °F	ATM. PRESS. PSIA	ALTITUDE FT	B>P> °F	ATM. PRESS. PSIA
0	212	14.7	8000	198	10.98
1000	210	14.21	9000	196	10.58
2000	209	13.72	10000	194	10.19
3000	207	13.23	11000	192	9.81
4000	205	12.75	12000	191	9.45
5000	203	12.29	13000	189	9.09
6000	201	11.83	14000	187	8.75
7000	199	11.39	15000	185	8.41

