

Upper Temperature Limits for Thermocouples Based on Size of Thermocouple

The diameter of the thermoelements in a thermocouple affect both the longevity of the sensor and the upper limits at which it can operate. In the chart below, you can see that as the diameter of the thermocouple decreases, the upper temperature limit at which it can operate also decreases. For example, in the Type E sensor, a .250 inch sensor can operate up to 870°C or 1600°F while a .010 inch diameter Type E sensor has an upper temperature limit of 370°C or 700°F.

Although a small diameter sensor can operate above it's rated temperature, its life will be considerably shorter and caution must be exercised in their use as the readings can become unreliable relatively quickly.

Type	.010	.020	.032	.064	.125	.250
Type E	370°C-700°F	430°C-800°F	540°C-1000°F	650°C-1200°F	870°C-1600°F	870°C-1600°F
Type J	320°C-600°F	370°C-700°F	490°C-900°F	590°C-1100°F	760°C-1400°F	760°C-1400°F
Type K	760°C-1400°F	870°C-1600°F	980°C-1800°F	1090°C-2000°F	1260°C-2300°F	1260°C-2300°F
Type N	760°C-1400°F	870°C-1600°F	980°C-1800°F	1090°C-2000°F	1260°C-2300°F	1260°C-2300°F
Type T	150°C-300°F	200°C-400°F	260°C-500°F	370°C-700°F	370°C-700°F	370°C-700°F
Type R/S		1480°C-2700°F				
Type B		1700°C-3100°F				