THERMOCOUPLE TYPE INFORMATION

JMS offers thermocouples and wire in the following types. Listed below are suggested criteria to consider in selecting the desired type for your application. Contact JMS Southeast if additional information is required.

(J)–Iron vs Constantan (Most Common)

May be used in vacuum, oxidizing, reducing, and inert atmospheres. Heavier gauge wire is recommended for long term life above 1000°F since the iron element oxidizes rapidly at these temperatures.

(T)–Copper vs Constantan (Most Common Cold)

May be used in vacuum, oxidizing, reducing, and inert atmospheres. It is resistant to corrosion in most atmospheres. High stability at sub-zero temperatures and its limits of error are guaranteed at cryogenic temperatures.

(K)–Chromel vs Alumel (Most Common Real Hot)

Recommended for continuous use in oxidizing or inert atmospheres up to 2300°F (1260°C), especially above 1000°F. Cycling above and below 1800°F (1000°C), is not recommended due to EMF alteration from hysteresis effects. Should not be used in sulfurous or alternating reducing and oxidizing atmospheres unless protected with protection tubes. Fairly reliable and accurate at high temperatures.

(E)–Chromel vs Constantan

May be used in oxidizing or inert atmospheres, but not recommended for alternating oxidizing or inert atmospheres. Not subject to corrosion under most atmospheric conditions. Has the highest EMF produced per degree than any other standard thermocouple and must be protected from sulfurous atmospheres.

(S,R)–Platinum vs Platinum Rhodium (Most Common Real, Real Hot)

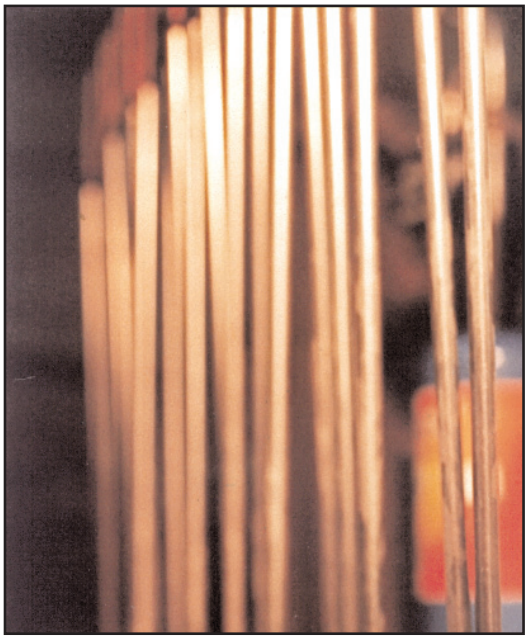
Recommended for use in oxidizing or inert atmospheres. Reducing atmospheres may cause excessive grain growth and drifts in calibration.

(N)–Nicrosil vs Nisil (New ... Better Than “K”)

May be used in oxidizing, dry reducing, or inert atmospheres. Must be protected in sulfurous atmospheres. Very reliable and accurate at high temperatures. Can replace Type K thermocouples in many application.

(C)–Tungsten 5% Rhenium vs Tungsten 26% Rhenium

Recommended for use in vacuum, high purity hydrogen, or pure inert atmospheres. May be used at very high temperatures (2316°C), however, is inherently brittle.



To print, right click or press ctrl + P

THERMOCOUPLE TYPE INFORMATION

	ANSI T/C TYPE	NAMES	CONDUCTOR IDENTIFICATION	ASTM COLOR CODING	MAGNETIC	IEC COLOR CODING
	J	Iron Constantan	+ -	white red	yes no	white black
	T	Copper Constantan	+ -	blue red	no no	white brown
	K	Chromel Alumel	+ -	yellow red	no yes	white green
	E	Chromel Constantan	+ -	purple red	no no	white violet
Not ANSI	P	Platinel	N/A	N/A	N/A	N/A
	S	Platinum 10% Rhodium Pure platinum	+ -	black red	no no	white orange
	R	Platinum 13% Rhodium Pure platinum	+ -	black red	no no	white orange
	B	Platinum 30% Rhodium Platinum 6% Rhodium	+ -	grey red	no no	white grey
	N	Nicrosil Nisil	+ -	orange red	no slightly	white pink
Not ANSI	C	Tungsten 5% Rhenium Tungsten 26% Rhenium	+ -	white red	no no	N/A

See Section 7 for wire insulation color codes.

ANSI THERMOCOUPLE TYPE	TEMP. RANGE (°C)	TEMP. RANGE (°F)	LIMITS OF ERROR STANDARD °C	LIMITS OF ERROR STANDARD °F	LIMITS OF ERROR SPECIAL °C	LIMITS OF ERROR SPECIAL °F
J	0 to 760	32 to 1400	±2.2 or ±0.75%	See Note	±1.1 or 0.4%	See Note
T	0 to 370	32 to 700	±1 or ±0.75%		±0.5 or 0.4%	
K	0 to 1260	32 to 2300	±2.2 or ±0.75%		±1.1 or ±0.4%	
E	0 to 870	32 to 1600	±1.7 or ±0.5%		±1 or ±0.4%	
S	0 to 1480	32 to 2700	±1.5 or ±0.25%		±0.6 or ±0.1%	
R	0 to 1480	32 to 2700	±1.5 or ±0.25%		±0.6 or ±0.1%	
N	0 to 1246	32 to 2300	±2.2 or ±0.75%		±1.1 or ±0.4%	
B	870 to 1700	1600 to 3100	±0.5%		±0.25%	
T[A]	-200 to 0	-328 to 32	±1 or ±1.5%		[B]	
E[A]	-200 to 0	-328 to 32	±1.7 or ±1%		[B]	
K[A]	-200 to 0	-328 to 32	±2.2 or ±2		[B]	

[A] Thermocouple and thermocouple materials are normally supplied to meet the tolerances specified in the table for temperatures above 0°C. The same materials, however, may not fall within the tolerances given for temperatures below 0°C in the section section of the table. If materials are required to meet the tolerances stated for temperatures below 0°C the purchase order must so state. Selection of materials usually will be required.

[B] Special tolerances for temperatures below 0°C are difficult to justify due to limited available information.

Note: The °F tolerance is 1.8 times larger than the °C tolerance at the equivalent °C temperature.