THERMOCOUPLE MATERIAL SPECIFICATIONS

ANSI CALIBRATION CODE	POSITIVE LEG	NEGATIVE LEG	TEMP. RANGE °F(°C)OF PROT. TC **	APPLICATION INFORMATION
J	Iron ThermoKanthal JP *	Constantan * Cupron * Advance * ThermoKanthal KN *	32 to 1400 (0 to 760)	Suitable for vacuum, reducing or inert atmospheres, oxidising atmospheres with reduced life. Iron oxidizes rapidly above 1000°F (538°C) so only heavy gauge wire is recommended for high temperature. Bare elements should not be sulphurous atmospheres above 1000°F (538°C)
K	Chromel * Tophel * T1 * ThermoKanthal KP *	ALumel * Nial * T2 * ThermoKanthal KN *	32 to 2300 (0 to 1260)	Recommended for continuous oxidizing or neutral atmpspheres. Mostly used above 1000°C (538°C). Subject to failure if exposed to sulphur. Preferential oxidation of chromium in positive leg at certain low oxygen concentrations causes "green rot" and large negative calibration drifts most serious in the 1500-1900°F (816-1038°C) range. Ventilation or inert-sealing of the protection tubes can prevent this.
T	Copper	Constantan * Cupron * Advance * ThermoKanthal KN *	-300 to 700 (-184 to 371)	Useable in oxidizing. reducing or inert atmospheres as well as vacuum. Not subject to corrosion in moist atmospheres. Limits are published for sub-zero temperature ranges.
E	Chromel * Tophel * T1 * ThermoKanthal KP *	Constantan * Cupron * Advance * ThermoKanthal KN *	32 to 1600 (0 to 871)	Recommended for continuously oxidizing or inert atmospheres. Sub-zero limits of error are not established. Highest thermoelectric output of common calibrations.
R S	Platinum 13% Rhodium Platinum 10% Rhodium	Platinum Platinum	100 to 3100 (538 to 1482)	Recommended for high temperature. Must be protected with a non-metallic protection tube and ceramic insulators. Continued high temperature usages cause grain which can lead to mechanical failure. Negative calibration drift causedby rhodium diffusion to pure leg as well as from rhodium volatilization. Type R is generally used in industry while Type S is general used in laboratories.
B	Platinum 30% Rhodium	Platinum 6% Rhodium	1600 to 3100 (871 to 1705)	Similar to type R & S but output is lower. Also less susceptible to grain growth and drift.
M	Nickel	18% Nickel Molybedenum	32 to 2250 (0 to 1287)	High temperature applications in inert or vacuum atmospheres. Usefull in many hydrogen applications. Continuous cycling causes excessive grain growth.
C	5% Tungsten Rhenium (W-5Re)	26% Tungsten Rhenium (W-26Re)	32 to 4200 (0 to 2315)	Very high temperature applications in inert or vacuum atmospheres. Preferred over Tungsten/26% Tungsten Rhenium because it is less brittle at low temperatures.
W	3% Tungsten Rhenium (W-3Re)	25% tungsten Rhenium (W-25Re)	32 to 4200 (0 to 2315)	The ductility of W3R3 leg is superior to pure Tugnsten, but not as good as W5Re. This combination has the highest output if the 3 common Tungsten Rhenium calibrations from 1860 to 4200°F.
N	Nicrosil *** 14.5% Chromium 1.4% Silicon 0.1% Magnesium Balance Nickel	4.2% Nisil *** 0.1% Silicon Magnesium Balance Nickel	32 to 2300 (0 to 1260)	Can be used in applications where Type K elements have shorter life and stability problems due to oxidation and the developement of "green rot".
NONE	Platinel * 5355	Platinel * 7674	32 to 2300 (0 to 1260)	Noble metal combination which approximates Type K curve bus has much improved oxidation resistance. Should be treated as any noble metal calibration.

* Trade Names. Chromel, Alumel: Hoskins Mfg. Co.; T1, T2, Advance: Driver-Harris Co.; Nial, Tophel: Wilbur B. Driver Co.; ThermoKanthal KP and KN: The Kanthal Corp.; Platinel; Engelhard Industries.

** The recommended temperature range is the temperature range for which limits of error have been established.

*** Trade names: Amax Specialty Metals Corp.