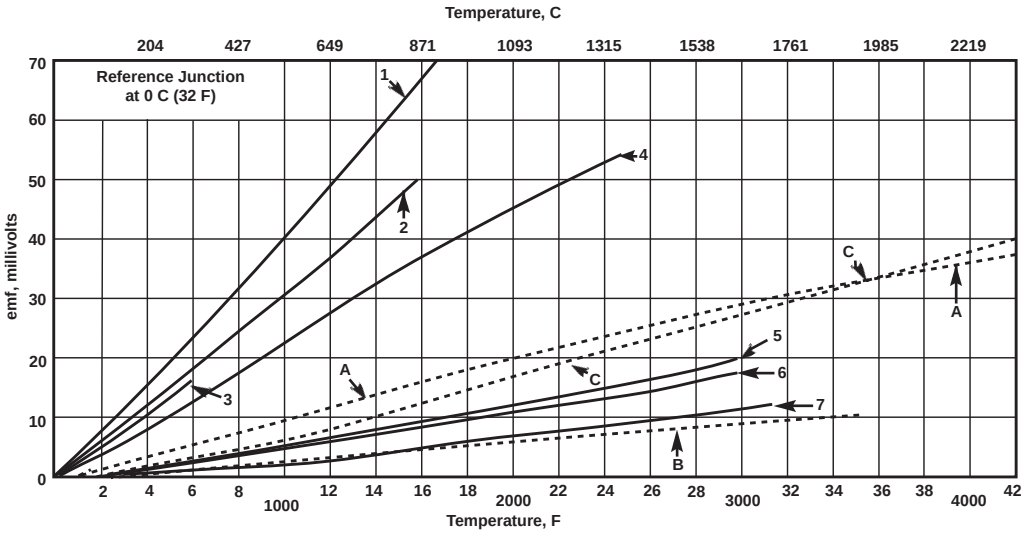
LEGEND:

Actual Curves
1 - Type E
Chromel
Constantan
2 - Type J
Iron
Constantan
3 - Type T
Copper
Constantan
4 - Type K
Chromel
Alumel
5 - Type R
Platinum, 13% Rhodium
Platinum
6 - Type S
Platinum, 10% Rhodium
Platinum
7 - Type B
Platinum, 30% Rhodium
Platinum, 6% Rhodium
Tentative Curves:
A - Tungsten, 5% Rhenium
Tungsten, 26% Rhenium
B - 40% Iridium, 60% Rhodium
Iridium
C - Tungsten
Tungsten, 26% Rhenium

Thermocouple Types



Type T Copper, Constant: High resistance to corrosion from atmospheric moisture condensation. Can be used in either oxidizing or reducing atmospheres.

Type E Chromel†, Constantan†: Primarily for oxidizing atmospheres. Does not corrode at sub-zero temperatures.

Type K Chromel, Alumel‡: Recommended between 583°C (1000°F) and 1093°C (2000°F) in oxidizing atmospheres.

Type J Iron, Constantan: Suitable where free oxygen is deficient. As oxidation of the iron conductor increases rapidly above 583°C (1000°F), heavier gauge wires should be used at high temperatures.

Type R and S Platinum-Rhodium, Platinum; Type B Platinum-30% Rhodium, Platinum-6% Rhodium. Recommended for use in oxidizing atmospheres. Easily contaminated in any other atmosphere, so caution should be used in these cases.

40% Iridium-60% Rhodium, Iridium: Suitable for oxidizing and inert atmospheres or vacuum.

Tungsten, Tungsten-26% Rhenium; Tungsten-5% Rhenium, Tungsten-26% Rhenium: Recommended for reducing and inert atmospheres or vacuum. *CAUTION: DO NOT use in the presence of FREE OXYGEN.*

Recommended Temperature Limits for Protected Thermocouple

	Minimum Temperature		8 Gauge		14 Gauge		20 Gauge		24 Gauge		30 Gauge	
			Maximum Temperature									
Thermocouple Type	C	F	C	F	C	F	C	F	C	F	C	F
Type T (Copper, Constantan)	–184	–300	–	–	–	–	260	500	204	400	204	400
Type J (Iron, Constantan)	–18	0	760	1400	593	1100	482	900	371	700	371	700
Type E (Chromel, Constantan)	–184	–300	871	1600	649	1200	538	1000	427	800	427	800
Type K (Chromel, Alumel)	–18	0	1260	2300	1093	2000	982	1800	871	1600	871	1600
Type R and Type S	–18	0	–	–	–	–	–	–	1482	2700	–	–
Type B	–18	0	–	–	–	–	–	–	1705	3100	–	–
40% Iridium-60% Rhodium, Iridium	–18	0	–	–	–	–	–	–	1985	3600	–	–
Tungsten, 5% Rhenium-Tungsten, 26% Rhenium	–18	0	–	–	–	–	–	–	2330	4200	–	–
Tungsten, Tungsten-26% Rhenium	–18	0	–	–	–	–	–	–	2330	4200	–	–

† Trademark Hoskins Manufacturing Co.
‡ Type K Thermocouple wire is manufactured under such trademarks as Chromel-Alumel (Hoskins Manufacturing Co.), Tophel-Nial (W. B. Driver Co.), T1-T2 (Driver-Harris Co.) etc.

WARNING: Situations dangerous to personnel and property may exist with the operation and maintenance of any combustion equipment. The presence of fuels, oxidants, hot and cold combustion products, hot surfaces, electrical power in control and ignition circuits, etc., are inherent with any combustion application. Components in combustion systems may exceed 160°F (71°C) surface temperatures and present hot surface contact hazard. Fives North American Combustion, Inc. suggests the use of combustion systems that are in compliance with all Safety Codes, Standards, Regulations and Directives; and care in operation.

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