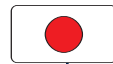
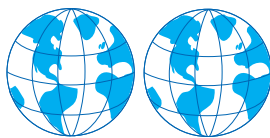


THERMOCOUPLE AND EXTENSION GRADE WIRE COLOR CODES

ANSI Code	Alloy Combination		Maximum Useful Temperature Range ++	Maximum Thermocouple Grade Temperature Range	EMF (mV) Over Max. Temperature Range	Standard Limits of Error (above 0°C)	Special Limits of Error (above 0°C)
	+ Lead	- Lead					
J	IRON Fe (magnetic)	Constantan Copper-Nickel Cu-Ni	Thermocouple Grade 32 to 1382°F 0 to 750°C Extension Grade 32 to 392°F 0 to 200°C	-346 to 2193°F -210 to 1200°C	-8.095 to 69.553	greater of 2.2°C or 0.75%	greater of 1.1°C or 0.4%
K	Chromel Nickel-Chromium Ni-Cr	Alumel Nickel-Aluminum Ni-Al (magnetic)	Thermocouple Grade -328 to 2282°F -200 to 1250°C Extension Grade 32 to 392°F 0 to 200°C	-454 to 2501°F -270 to 1372°C	-6.458 to 54.886	greater of 2.2°C or 0.75%	greater of 1.1°C or 0.4%
V⁺	Copper Cu	Constantan Copper-Nickel Cu-Ni	Extension Grade 32 to 176°F 0 to 80°C				
T	Copper Cu	Constantan Copper-Nickel Cu-Ni	Thermocouple Grade -328 to 662°F -250 to 350°C Extension Grade -76 to 212°F -60 to 100°C	-454 to 752°F -270 to 400°C	-6.528 to 20.872	greater of 1.0°C or 0.75%	greater of 0.5°C or 0.4%
E	Nickel-Chromium Ni-Cr	Constantan Copper-Nickel Cu-Ni	Thermocouple Grade -328 to 1652°F -200 to 900°C Extension Grade 32 to 392°F 0 to 200°C	-454 to 1832°F -270 to 1000°C	-9.835 to 76.373	greater of 1.7°C or 0.5%	greater of 1.0°C or 0.4%
N	Nicrosil Ni-Cr-Si	NISIL Ni-Si-Mg	Thermocouple Grade -450 to 2372°F -270 to 1300°C Extension Grade 32 to 392°F 0 to 200°C	-450 to 2372°F -270 to 1300°C	-4.345 to 47.513	greater of 2.2°C or 0.75%	greater of 1.1°C or 0.4%
R	Platinum- 13% Rhodium Pt-13% Rh	Platinum Pt	Thermocouple Grade 32 to 2642°F 0 to 1450°C Extension Grade 32 to 300°F 0 to 150°C	-58 to 3214°F -50 to 1768°C	-0.226 to 21.101	greater of 1.5°C or 0.25%	greater of 0.6°C or 0.1%
S	Platinum- 10% Rhodium Pt-10% Rh	Platinum Pt	Thermocouple Grade 32 to 2642°F 0 to 1400°C Extension Grade 32 to 300°F 0 to 150°C	-58 to 3214°F -50 to 1768°C	-0.236 to 18.693	greater of 1.5°C or 0.25%	greater of 0.6°C or 0.1%
U⁺	Copper Cu	Copper-Low Nickel Cu-Ni	Extension Grade 32 to 122°F 0 to 50°C				
B	Platinum- 30% Rhodium Pt-30% Rh	Platinum 6% Rhodium Pt-6% Rh	Thermocouple Grade 32 to 3092°F 0 to 1700°C Extension Grade 32 to 212°F 0 to 100°C	32 to 3308°F 0 to 1820°C	0 to 13.820	0.5% over 800°C	Not Established
G⁺ (W)	Tungsten W	Tungsten- 26% Rhenium W-26% Re	Thermocouple Grade 32 to 4208°F 0 to 2320°C Extension Grade 32 to 500°F 0 to 260°C	32 to 4208°F 0 to 2320°C	0 to 38.564	greater of 4.5°C or 1.0%	Not Established
C⁺ (W5)	Tungsten- 5% Rhenium W-5% Re	Tungsten- 26% Rhenium W-26% Re	Thermocouple Grade 32 to 4208°F 0 to 2320°C Extension Grade 32 to 1600°F 0 to 870°C	32 to 4208°F 0 to 2320°C	0 to 37.066	greater of 4.5°C or 1.0%	Not Established
D⁺ (W3)	Tungsten- 3% Rhenium W-3% Re	Tungsten- 25% Rhenium W-25% Re	Thermocouple Grade 32 to 4208°F 0 to 2320°C Extension Grade 32 to 500°F 0 to 260°C	32 to 4208°F 0 to 2320°C	0 to 39.506	greater of 4.5°C or 1.0%	Not Established

++ Except as further restricted by temperature limits for T/C diameter and insulation tables that follow. ▼ Not official symbol or standard designation.



Color Coding		International IEC 584-3	International IEC 584-3 Intrinsically Safe	CZECH British to BS 1843	Netherlands German to DIN 43710	Japanese to JIS C 1610-1981	French to NFE-18001	Comments Environment-Bare Wire	ANSI Code
Thermocouple Grade	Extension Grade								
								Reducing Vacuum, Inert. Limited Use in Oxidizing at High Temperatures. Not Recommended for Low Temperatures.	J
								Clean Oxidizing and Inert. Limited use in Vacuum or Reducing. Wide Temperature Range. Most Popular Calibration.	K
None Established	None Established							Alternative to KX Type Extension Wire for Low Temperature. Not Recommended for General Use.	V'
								Mid Oxidizing, Reducing Vacuum or Inert. Good Where Moisture is Present. Low Temperature and Cryogenic Applications.	T
								Oxidizing or Inert. Limited Use in Vacuum or Reducing Highest EMF Change Per Degree	E
					No Standard Use American Color Code			Alternative to Type K More Stable at High Temperature	N
None Established								Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of contamination. High Temperature	R
None Established								Oxidizing or Inert. Do No Insert in Metal Tubes. Beware of Contamination. High Temperature	S
None Established								Extension Guide Connecting Wire for R and S Thermocouples Also Known as RX and SX Extension Wire	U'
None Established				No Color Standard			No Color Standard	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of Contamination. High Temperature. Common Use in Glass Industry.	B
None Established				No Standard Use American Color Code				Vacuum, Inert, Hydrogen. Beware of Embrittlement. Not Practical Below 399°C (750°F) Not for Oxidizing Atmosphere.	G' (W)
None Established				No Standard Use American Color Code				Vacuum, Inert, Hydrogen. Beware of Embrittlement. Not Practical Below 399°C (750°F) Not for Oxidizing Atmosphere.	C' (W5)
None Established				No Standard Use American Color Code				Vacuum, Inert, Hydrogen. Beware of Embrittlement. Not Practical Below 399°C (750°F)–Not for Oxidizing Atmosphere.	D' (W3)

++Except as further restricted by temperature limits for T/C diameter and insulation tables that follow. ▼ Not official symbol or standard designation.