





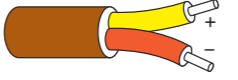
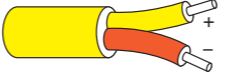

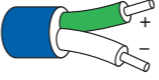


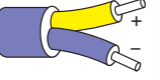
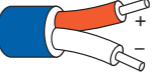
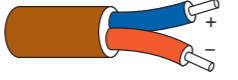
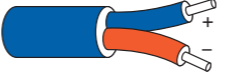
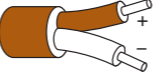

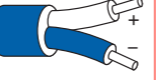

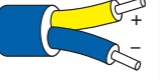

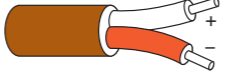







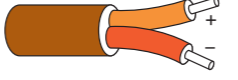
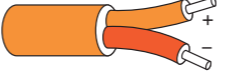
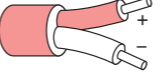
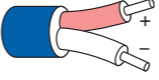

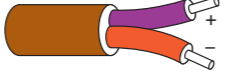
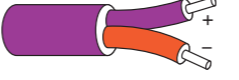
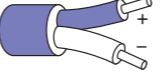
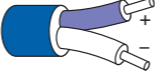


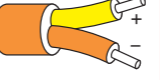
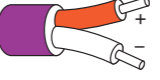


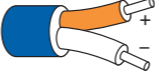
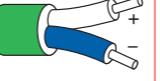



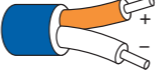
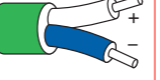

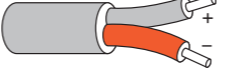
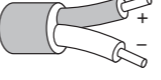
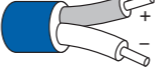


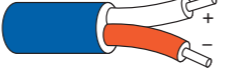
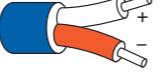
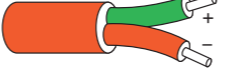
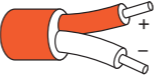

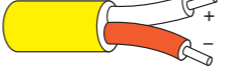



Thermocouple Cable Thermocouple and Extension Grade · Codes · Conductor Combinations · National and International Standards

Thermocouple Conductor Type	Conductor Combinations		ANSI MC96.1-1982 United States Color Coding 		IEC 60584-3 Color Coding 		Redundant national color coding for insulation of thermocouple cables				Temperature Range		Limits of Error (whichever is greater)	
			Thermocouple Grade	Extension Grade	Thermocouple Grade	Intrinsically Safe	British to BS 1843 	German to DIN 43714 	French to NFC 42324 	Japanese to JIS C 1610-1981 	Thermocouple Grade	Extension Grade	Standard	Special
K	Nickel - Chromium <small>Chromel®, Thermokanthal KP®, NiCr, T1®, Tophel®</small>	Nickel - Aluminum (Magnetic) <small>Ni-Al, Alumel®, Thermokanthal KN®, T2®, NiAl®</small>	KK 	KX 							-454 to 2300°F -270 to 1260°C	32 to 392°F 0 to 200°C	±2.2°C or ±0.75%	±1.1°C or 0.4%
T	Copper	Copper - Nickel <small>Constantan, Advance®, Cupron®</small>	TT 	TX 							-454 to 700°F -270 to 370°C	32 to 392°F 0 to 200°C	±1.0°C or ±0.75%	±0.5°C or 0.4%
J	Iron (Magnetic)	Copper - Nickel <small>Nickel-Copper, Constantan, Advance®, Cupron®</small>	JJ 	JX 							-346 to 1400°F -210 to 760°C	32 to 392°F 0 to 200°C	±2.2°C or ±0.75%	±1.1°C or 0.4%
N	Nickel - Chromium - Silicon <small>Nicrosil</small>	Nickel - Silicon - Magnesium <small>Nisil</small>	NN 	NX † 							-454 to 2300°F -270 to 1260°C	32 to 392°F 0 to 200°C	±2.2°C or ±0.75%	±1.1°C or 0.4%
E	Nickel - Chromium <small>Chromel®, Tophel®, Chromium, Nickel</small>	Copper - Nickel <small>Nickel-Copper, Constantan, Advance®, Cupron®</small>	EE 	EX 							-454 to 1600°F -270 to 870°C	32 to 392°F 0 to 200°C	±1.7°C or ±0.5%	±1.0°C or ±0.4%
S	Platinum - 10% Rhodium	Platinum	None Established	SX 							-58 to 2700°F -50 to 1480°C	32 to 392°F 0 to 200°C	±1.5°C or ±0.25%	±0.6°C or ±0.1%
R	Platinum - 13% Rhodium	Platinum	None Established	RX 							-58 to 2700°F -50 to 1480°C	32 to 392°F 0 to 200°C	±1.5°C or ±0.25%	±0.6°C or ±0.1%
B	Platinum - 30% Rhodium	Platinum - 6% Rhodium	None Established	BX 							32 to 3100°F 0 to 1700°C	32 to 212°C 0 to 100°C	±0.5%	±0.25%
G*	Tungsten	Tungsten 26% Rhenium	None Established	GX* 							32 to 4200°F 0 to 2315°C	32 to 212°C 0 to 100°C	-	-
C*	Tungsten 5% Rhenium	Tungsten 26% Rhenium	None Established	CX † 				Historical industry accepted colours to no officially recognised standard ** 			32 to 4200°F 0 to 2315°C	32 to 212°C 0 to 100°C	±4.4°C to 425°C ±1.0% to 2320°C	-
D*	Tungsten 3% Rhenium	Tungsten 25% Rhenium	None Established	DX* 							32 to 4200°F 0 to 2315°C	32 to 212°C 0 to 100°C	-	-

* Types G and D are not officially recognized symbols.

** A lot of cable still in use and being supplied could well be to the historical industry accepted standard shown in the table below. If you are in any doubt about colour codes, please contact one of our engineers who will be pleased to assist you.

† According to ASTM E 230.

Thermocouple extension wire is manufactured from conductors having approximately the same thermoelectric characteristics as thermocouple wire but the accuracy is for a more limited range. Extension wire can offer a cost advantage.

For base metal thermocouples, the wire is the same composition as the corresponding thermocouple.

For noble metal thermocouples, the wire is an entirely different alloy which matches the noble metal characteristics over a specified temperature range.

The maximum temperatures are limited by the type of insulation used.

For Type B thermocouples, copper conductors can be used from 32 to 125°F without the need for compensating wire.

If materials are required to meet the tolerances stated for temperatures below 0°C, it should be stated at the time of the order. Material selection is usually required.