

Thermocouples wire and extensions wire chart

"Thermocouple wire or extension grade wire is recommended to be used to connect thermocouples to the sensing or control instrumentation. The conditions of measurement determine the type of thermocouple wire and insulation to be used. Temperature range, environment, insulation requirements, response, and service life should be considered.

Thermocouple extension wire has approximately the same thermoelectric characteristics as thermocouple wire, but its accuracy is guaranteed over a more limited range of temperatures 204 °C (400 °F). Thermocouple extension wire can offer advantages in cost when used for connections between thermocouples and instruments.

For base metal type of thermocouples J, K, T, E, and N, extension wire is of substantially the same composition as the corresponding thermocouple type. For noble metal types R,S & B however, an entirely different alloy is formulated to match the noble metal characteristics over a specified temperature range. This is necessary due to the high cost of the noble metals which could otherwise be necessary for the interconnection.

Thermocouple wire can be fabricated into an accurate and dependable thermocouple by joining the thermoelements at the sensing end. Temperature limit of the thermocouple depends on the thermocouple wire size; wire insulation; and environmental factors.

The following technical data sheet will help you to choose the right product for the right application. For more information please give us a call.

Service Temperature Limits		Insulations		All Constructions Are Available with Optional Metallic Braid/Wrap							Resistance To						
				Popular Constructions													
Continuous	Single	Conductor	Jacket	Grade	ANSI Color Coded	AWG (Strands)	Wire Type	Limits of Error	Calibrations							Moisture	Abrasion
									K	J	T	E	S	B	N		

Polyvinyl Insulations

-40 to 105°C (-40 to 221°F)	105°C (221°F)	PVC	PVC	Extension	Y	16	Solid	Standard	X	X						Excellent	Excellent	
						16 (7/24)	Stranded		X	X								
						20	Solid	Standard	X	X	X	X	X					
						20 (7/28)	Stranded		X	X	X							
						24	Solid	Standard	X	X	X							
						24 (7/32)	Stranded		X	X	X							
-40 to 105°C (-40 to 221°F)	105°C (221°F)	PVC	None (Ripcord)	Thermocouple	Y	24	Solid	Standard	X	X	X				Excellent	Good		
								Special	X	X	X							
-40 to 105°C (-40 to 221°F)	105°C (221°F)	PVC	PVC (Twisted & Shielded)	Extension	Y	16	Solid	Standard	X	X	X				Excellent	Good		
						16 (7/24)	Stranded		X	X	X							
						20	Solid	Standard	X	X	X	X	X					
						20 (7/28)	Stranded		X	X	X							
						24	Solid	Standard	X	X	X							
						24 (7/32)	Stranded		X	X	X							

Silicon Rubber Insulation

200°C (392°F)	260°C (500°F)	Silicon Rubber	Silicon Rubber / Fiberglass	Extension	Y	18 (19/30)	Stranded	Standard	X				X		X	Good	Fair
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Teflon Insulations (® Registered Trademark of E.I. DuPont Inc.)

-200 to 200°C (-328 to 392°F)	260°C (500°F)	FEP® Teflon Extruded	FEP® Teflon Extruded	Thermocouple	Y	20	Solid	Standard	X	X	X	X					Excellent	Excellent		
								Special	X	X	X	X								
						20 (7/28)	Stranded	Standard	X	X	X	X								
								Special	X	X	X	X								
						24	Solid	Standard	X	X	X	X								
								Special	X	X	X	X								
				24 (7/32)	Stranded	Standard	X	X	X	X										
						Special	X	X	X											
28	Solid	Special	X	X	X															
			X	X	X															
X			X	X																
X			X	X																
Extension	Y	20	Solid	Standard	X	X	X	X	X											
					24						X									
-200 to 260°C (-328 to 500°F)	315°C (600°F)	TFE® Teflon Tape Fused	TFE® Teflon Tape Fused	Thermocouple	Y	20	Solid	Standard	X	X	X	X					Excellent	Good		
								Special	X	X	X	X								
						20 (7/28)	Stranded	Standard	X	X	X	X								
								Special	X	X	X	X								
						24	Solid	Standard	X	X	X	X								
								Special	X	X	X	X								
24 (7/32)	Stranded	Standard	X	X	X	X														
-200 to 200°C (-328 to 392°F)	260°C (500°F)	FEP® Teflon Extruded	FEP® Teflon Extruded (Twisted & Shielded)	Extension	Y	16	Solid	Standard	X	X							Excellent	Excellent		
									16 (7/24)	Stranded	X	X								
						20	Solid	Standard	X	X	X	X	X							
				20 (7/28)	Stranded				X	X	X	X								
				Thermocouple	Y	20	Solid	Standard	X	X	X									
								Special	X	X	X									
24	Solid	Special	X			X	X													
		24 (7/32)	Stranded	Standard	X	X	X													
-267 to 260°C (-450 to 500°F)	290°C (550°F)	Teflon PFA ®	Teflon PFA ®	Thermocouple	Y	20	Solid	Standard	X	X	X	X					Excellent	Good		
								Special	X	X	X	X								
						20 (7/28)	Stranded	Standard	X	X	X	X								
								Special	X	X	X	X								
						24	Solid	Standard	X	X	X	X								
								Special	X	X	X	X								
24 (7/32)	Stranded	Standard	X	X	X	X														

Kapton Insulations (® Registered Trademark of E.I. DuPont Inc.)

-267 to 316°C (-450 to 600°F)	430°C (800°F)	Kapton® Fused Tape	None (Twisted)	Thermocouple	N	20	Solid	Standard	X	X							Excellent	Excellent		
								Special	X	X										
						24		Solid	Standard	X	X									
									Special	X	X									

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-267 to 316°C (-450 to 600°F)	430°C (800°F)	Kapton® Fused Tape	Kapton® Fused Tape	Thermocouple	N	20	Solid	Standard	X	X							Excellent	Excellent
								Special	X	X								
						20 (7/28)	Stranded	Standard	X	X								
						24	Solid	Standard	X	X								
Special	X	X																
-267 to 316°C (-450 to 600°F)	430°C (800°F)	Double Kapton® Fused Tape	Double Kapton® Fused Tape	Thermocouple	N	20	Solid	Standard	X	X							Excellent	Excellent
								Special	X	X								
						20 (7/28)	Stranded	Standard	X	X								
						24	Solid	Standard	X	X								
								Special	X	X								
						30	Solid	Special	X	X								

Synthetic Fiber Insulations

290°C (550°F)	340°C (650°F)	Synthetic Fiber	Synthetic Fiber	Extension	Y	16	Solid	Standard	X	X					X	X	Good	Good
						16 (7/24)	Stranded		X	X					X	X		
290°C (550°F)	340°C (650°F)	TFE Teflon ® Tape/ Synthetic Fiber	Synthetic Fiber	Extension	Y	16	Solid	Standard	X	X					X	X	Good	Good
						16 (7/24)	Stranded		X	X					X	X		

Standard Fiberglass Braided Yarn Insulations

480°C (900°F)	540°C (1000°F)	Fiber Glass Braid	Fiber Glass Braid	Thermocouple	Y	20	Solid	Standard	X	X	X	X					Good	Fair
								Special	X	X	X	X						
						20 (7/28)	Stranded	Standard	X	X	X	X						
						24	Solid	Standard	X	X	X							
Special	X	X	X															
Resin Retained to 204°C(400°F)				Extension	Y	20	Solid	Standard							X			
						24									X			
480°C (900°F)	540°C (1000°F)	Fiber Glass Yarn Wrapped	Fiber Glass Braid	Thermocouple	Y	24	Solid	Standard	X	X							Good	Fair
								Special	X	X								
						28	Solid	Standard	X	X								
								Special	X	X								
Resin Retained to 204°C(400°F)					Y	30	Solid	Standard	X	X								
								Special	X	X								

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Refrasil® High Temperature Fiberglass Insulations (® Registered Trademark of Hitco)

705°C (1300°F)	870°C (1600°F)	Refrasil ®	None (Twisted)	Thermocouple	Y	20	Solid	Standard	X	X							Good	Good
Resin Retained to 204°C(400°F)								Special	X	X								
705°C (1300°F)	870°C (1600°F)	Refrasil®	Refrasil®	Thermocouple	Y	20	Solid	Standard	X	X							Good	Good
Resin Retained to 204°C(400°F)								Special	X	X								
705°C (1300°F)	870°C (1600°F)	Refrasil®	Refrasil®	Thermocouple	Y	24	Solid	Standard	X	X							Good	Good
Resin Retained to 204°C(400°F)								Special	X	X								

Vitreous Silica Braided Yarn Insulations

980°C (1800°F)	1095°C (2000°F)	Vitreous Silica (Heavy)	Vitreous Silica (Heavy)	Thermocouple	N	20	Solid	Standard	X								Fair	Fair
Resin Retained to 204°C(400°F)		Special	X															
980°C (1800°F)	1095°C (2000°F)	Vitreous Silica (Medium)	Vitreous Silica (Medium)	Thermocouple	N	20	Solid	Standard	X								Fair	Fair
Resin Retained to 204°C(400°F)		Special	X															

Ceramic Fiber Braided Yarn Insulations

1205°C (2200°F)	2600°C (4750°F)	Ceramic Fiber (Heavy)	Ceramic Fiber (Heavy)	Thermocouple	N	20	Solid	Standard	X								Fair	Good
Resin Retained to 204°C(400°F)		Special	X															
1205°C (2200°F)	2600°C (4750°F)	Ceramic Fiber (Medium)	Ceramic Fiber (Medium)	Thermocouple	N	20	Solid	Standard	X								Fair	Good
Resin Retained to 204°C(400°F)		Special	X															



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