



# INSULATED THERMOCOUPLE AND EXTENSION WIRE PRODUCTS GUIDE

Insulated thermocouple wire and thermocouple extension wire products are used to assist in monitoring and controlling temperatures in a wide and varied range of environments.

## General

Information contained in this brochure is intended to help customers select the proper products for required applications. The following information will serve as a handy reference to some of the nomenclature involved with thermocouple and extension wire and insulation systems. By following this information, orders can be placed easily and accurately.

## Thermocouple Wire

A well calibrated temperature sensing device allowing accuracy in critical environment measurements.

## Thermocouple Extension Wire

Provides an economical way of carrying the signal (measured in millivolts) to an instrument.

## Thermocouple System

The thermocouple wire, extension wire and instrument must correspond so that the signal will flow accurately. The basic system selected (ANSI type) for the application must take into consideration conditions such as length of service, atmosphere, temperature and desired response time. Smaller gauges provide faster response time with a shorter service life at elevated temperatures while larger gauge sizes provide longer service life and slower response time.

## ANSI Letter Designations

Thermocouple and extension wires are specified by ANSI letter designations for calibration. Positive and negative legs are identified by the appropriate letter suffixes P and N respectively.

ANSI	Description	Popular Generic & Trade Names
<b>E</b>	EP	Chromel, Tophel
	EN	Constantan, Cupron, Advance
<b>J</b>	JP	Iron
	JN	Constantan, Cupron, Advance
<b>K</b>	KP	Chromel, Tophel
	KN	Alumel, Nial
<b>T</b>	TP	Copper
	EN	Constantan, Cupron, Advance
<b>N</b>	NP	Nicrosil
	NN	Nisil
<b>R</b>	RP	Platinum 13% Rhodium
	RN	100% Platinum
<b>S</b>	SP	Platinum 10% Rhodium
	SN	100% Platinum
<b>B</b>	BP	Platinum 30% Rhodium
	BN	Platinum 6% Rhodium



## ANSI Limits of Error

On October 6<sup>th</sup>, 1969, nomenclature of the American National Standards Institute, Inc (ANSI) superceded previously used ISA designations. Unless otherwise specified, thermocouple and extension wire is supplied to meet standard limits of error of ANSI circular MC96.1 1982. Special limits of error are also available per ANSI MC96.1 at an additional charge. The standard and special limits of error for thermocouple and extension wires are given in the accompanying tables. Where limits of error are given in percent, the percentage applies to the temperature being measured.

Limits of error apply to new wire as delivered and do not allow for calibration drift during use. These changes are governed by such factors as wire size, temperature/time of exposure and environment.

ANSI TYPE	Temperature Range		Standard °C **	Special °C **
	°C	°F		
E	0 to 900	32 to 1600	± 1.7 or 0.5%	± 1.0 or ± 0.4%
J	0 to 750	32 to 1400	± 2.2 or 0.75%	± 1.1 or ± 0.4%
K	0 to 1250	32 to 2300	± 2.2 or 0.75%	± 1.1 or ± 0.4%
T	0 to 350	32 to 700	± 1.0 or 0.75%	± 0.5 or ± 0.4%
N	0 to 1250	32 to 2300	± 2.2 or 0.75%	± 1.1 or ± 0.4%
R or S	0 to 1450	32 to 2700	± 1.5 or 0.25%	± 0.6 or ± 0.1%
B	800 to 1700	1600 to 3100	± 0.5%	-----

\*\* ± tolerance of error is whichever is greater

## Limits of Error for Thermocouple Extension Wires

ANSI TYPE	Temperature Range		Standard °C	Special °C
	°C	°F		
EX	0 to 200	32 to 392	± 1.7	± 1.1
JX	0 to 200	32 to 392	± 2.2	± 1.1
KX	0 to 200	32 to 392	± 2.2	± 1.1
TX	-60 to 100	-76 to 212	± 1.0	± 0.5
NX	0 to 200	32 to 392	± 2.2	-----

## Solid and Stranded Conductors

Thermocouple wire and extension wire are usually solid conductors. When greater flexibility is required, either may be had in stranded construction. The accompanying table provides the standard stranded combinations used, however, other stranding combinations may be ordered to suit requirements.

Nominal Thermocouple Resistance Ohms /Double Ft. @ 88°(20°C)					
AWG	O.D. INCHES	ANSI TYPES			
		E	J	K	T
8	0.128	0.044	0.022	0.036	0.018
14	0.064	0.175	0.089	0.147	0.074
16	0.051	0.278	0.141	0.233	0.118
18	0.040	0.443	0.225	0.371	0.188
20	0.032	0.704	0.357	0.590	0.298
24	0.020	1.779	0.903	1.490	0.753
26	0.016	2.842	1.441	2.370	1.203
28	0.013	4.522	2.295	3.786	1.914
30	0.010	7.190	3.650	6.020	3.043
36	0.006	28.760	14.600	24.080	12.172
14(7)f	0.073	0.163	0.082	0.137	0.069
16(7)f	0.080	0.259	0.131	0.217	0.110
18(7)f	0.048	0.414	0.210	0.346	0.175
20(7)f	0.038	0.659	0.334	0.551	0.279

## Conductor Calibration and Certification

Thermocouple wire and extension wire can be factory calibrated and certified at an extra charge. Each coil, reel or spool of wire is then tagged to show the individual departure from curve. Once calibrated, their exact departure from the standard curve at any specified temperature is known and can be taken into account. Thermocouple wire samples sent to the factory for calibrating must be at least 36 inches long. A certificate of calibration is furnished for all calibrated items and a notarized certificate is available at an additional charge. Each item calibrated is also tagged with the results.

## Metallic Overbraids/Shields

While products are designed with abrasion resistance in mind, metallic overbraids can add durability, flexibility, and abrasion protection to all products, as well as electrical interference shielding. Metal overbraids can be color coded by means of a colored fiberglass yarn tracer, for ease of thermocouple type identification, at no extra charge. Stainless steel, Inconel, and tinned plated copper overbraids are available on all products.



## Color Coding

With the exception of very high temperature insulation constructions such as ceramic fiber and vitreous silica fiber, all insulated thermocouple wire and extension wire is color coded. ANSI color codes are employed as a standard unless otherwise requested. Colored tracers may be employed on braided items to identify individual conductors and/or as an identifier in overall braids to determine the thermocouple type.

	ANSI TC GRADE	ANSI EXT GRADE	BRITISH BS 1843	FRENCH NFC 42-323	GERMAN DIN 43714	JAPANESE JISC 1610	IEC to 584	IEC INTRINSICALLY SAFE
EP	VIOLET	VIOLET	BROWN	YELLOW	RED	RED	VIOLET	VIOLET
EN	RED	RED	BLUE	VIOLET	BLACK	WHITE	WHITE	WHITE
OVERALL	BROWN	VIOLET	BROWN	VIOLET	BLACK	VIOLET	VIOLET	BLUE
JP	WHITE	WHITE	YELLOW	YELLOW	RED	RED	BLACK	BLACK
JN	RED	RED	BLUE	BLACK	BLUE	WHITE	WHITE	WHITE
OVERALL	BROWN	BLACK	BLACK	BLACK	BLUE	YELLOW	BLACK	BLUE
KP	YELLOW	YELLOW	BROWN	YELLOW	RED	RED	GREEN	GREEN
KN	RED	RED	BLUE	VIOLET	GREEN	WHITE	WHITE	WHITE
OVERALL	BROWN	YELLOW	RED	YELLOW	GREEN	BLUE	GREEN	BLUE
TP	BLUE	BLUE	WHITE	YELLOW	RED	RED	BROWN	BROWN
TN	RED	RED	BLUE	BLUE	BROWN	WHITE	WHITE	WHITE
OVERALL	BROWN	BLUE	BLUE	BLUE	BROWN	BROWN	BROWN	BLUE
NP	ORANGE	ORANGE					PINK	PINK
NN	RED	RED	N/A	N/A	N/A	N/A	WHITE	WHITE
OVERALL	BROWN	ORANGE					PINK	BLUE
RP SP	GREEN	GREEN	WHITE	YELLOW	RED	RED	ORANGE	ORANGE
RN SN	RED	RED	BLUE	GREEN	WHITE	WHITE	WHITE	WHITE
OVERALL	N/A	GREEN	GREEN	GREEN	WHITE	BLACK	ORANGE	BLUE
BP	GRAY	GRAY			RED	RED	GRAY	GRAY
BN	RED	RED	N/A	N/A	GRAY	GRAY	WHITE	WHITE
OVERALL	N/A	GRAY			GRAY	GRAY	GRAY	BLUE



## Insulation and Jacket

It is critical that the Insulation system used to protect thermocouple and extension wire be properly selected so as to help provide accurate readings over a desired period of time. Most constructions are temperature rated for continuous use and for one time reading applications. The continuous use temperature rating is generally the highest temperature at which a particular construction will provide protection for an indefinite period. The impregnation of all treated braids is only retained to 400°F(204°C). The one time rating is the highest temperature exposure that the material will allow an accurate reading on a one time basis. It is unlikely, however, that the wire could be repeatedly used after this exposure. The following chart lists typical characteristics for various high temperature materials. The ratings below are meant to serve only as a general guide. Product performance may vary upon use and application of the product.

### Basic Characteristics of Selected Insulation Materials for Thermocouple and Extension Wire

MATERIAL	Temp Range		Flexibility	Flame Retardance	Resistance To				
	Continuous	Single			Abrasion	Acids	Solvents	Bases	Moisture
Polyvinyl Chloride	221 °F 105 °C	Same	Excel	Good	Good	Good	Fair	Good	Good
Silicone Rubber	392 °F 200 °C	500 °F 260 °C	Excel	Good	Fair	Poor	Fair	Good	Good
FEP Teflon®	392 °F 200 °C	500 °F 260 °C	Good	Excel	Excel	Excel	Excel	Excel	Excel
PTFE Tape	500 °F 260 °C	600 °F 316 °C	Good	Excel	Excel	Excel	Excel	Excel	Excel
Aramid Fiber	550 °F 288 °C	650 °F 343 °C	Good	Excel	Excel	Excel	Excel	Excel	Good
Kapton®	600 °F 316 °C	800 °F 427 °C	Good	Excel	Excel	Excel	Excel	Excel	Excel
Fiber Glass	900 °F 482 °C	1000 °F 538 °C	Good	Excel	Good	Excel	Excel	Excel	Good
High Temp Fiber Glass	1300 °F 704 °C	1600 °F 871 °C	Good	Excel	Good	Excel	Excel	Excel	Good
Vitreous Silica Yarn	1600 °F 871 °C	2000 °F 1093 °C	Good	Excel	Fair	Good	Excel	Good	Fair
Ceramic Fiber	2200 °F 1204 °C	2600 °F 1427 °C	Good	Excel	Fair	Excel	Excel	Excel	Fair

Kapton ® and Teflon ® are registered trade marks of DuPont



## Thermocouple Product Guide

### **Fiberglass/Fiberglass**

900°F 482°C Continuous  
1000°F 538°C Single Reading



### **S Fiberglass/S Fiberglass**

1300°F 704°C Continuous  
1600°F 871°C Single Reading



### **Vitreous Silica/Vitreous Silica**

1300°F 704°C Continuous  
1600°F 871°C Single Reading



### **Ceramic Fiber/Ceramic Fiber**

1600°F 871°C Continuous  
2000°F 1093°C Single Reading



### **Kapton®/Kapton®**

600°F 316°C Continuous  
800°F 427°C Single Reading



### **PTFE/PTFE**

500°F 260°C Continuous  
600°F 316°C Single Reading



### **PFA/PFA**

500°F 260°C Continuous  
600°F 316°C Single Reading



### **FEP/FEP**

392°F 200°C Continuous  
500°F 260°C Single Reading



### **SRG/Fiberglass**

392°F 200°C Continuous  
500°F 260°C Single Reading



### **PVC/PVC**

221°F 105°C Continuous





# THERMOCOUPLE WIRE

Fiberglass Braid Insulation  
Fiberglass Braid Jacket

900°F 482°C Continuous 1000°F 538°C Single Reading

## Product Description



Conductor: Thermocouple wire per ANSI MC 96.1 & ASTM E230  
(Solid or stranded available)

Insulation: Fiberglass braid with a high temperature saturant

Jacket: Fiberglass braid with a high temperature saturant



- Excellent flame retardance, resistance to acids, solvents and bases
- Good resistance to moisture and abrasion
- Good flexibility

Widely used in industrial applications such as steel, aluminum and glass plants. Also used on injection molding and extrusion equipment and the heat treating industry.

Conductor		Insulation		Jacket		OD		Ship Wt	
AWG	MM <sup>2</sup>	Inches	MM	Inches	MM	Inches	MM	Lbs/MF	Kg/Km
24	0.51	0.005	0.13	0.005	0.13	.040 x .070	1.02 x 1.78	4	6
22	0.64	0.005	0.13	0.005	0.13	.045 x .080	1.14 x 2.03	5	7
20	0.81	0.005	0.13	0.005	0.13	.052 x .094	1.32 x 2.39	8	12
18	1.02	0.005	0.13	0.005	0.13	.060 x .110	1.52 x 2.79	13	19
16	1.29	0.005	0.13	0.005	0.13	.070 x .130	1.78 x 3.30	21	31

24(7)	0.61	0.005	0.13	0.005	0.13	.044 x .078	1.12 x 1.98	4	6
20(7)	0.97	0.005	0.13	0.005	0.13	.056 x .102	1.42 x 2.59	8	12
16(7)	1.47	0.005	0.13	0.005	0.13	.078 x .146	1.98 x 3.70	21	31

Conductor insulation and overall jacket are color coded per ANSI MC 96.1 and ASTM E230. International color codes available on request.

Available in standard and special limits of error per ANSI MC 96.1, ASTM E230 and IEC 584

Stainless Steel, Inconel, or Tin Plated Copper overbraid is available on request



# THERMOCOUPLE WIRE

High Temp Fiberglass Braid Insulation  
 High Temp Fiberglass Braid Jacket

1300°F 704°C Continuous 1600°F 871°C Single Reading

## Product Description



Conductor: Thermocouple wire per ANSI MC 96.1 & ASTM E230  
 (Solid or stranded available)

Insulation: High temperature fiberglass braid and saturant

Jacket: High temperature fiberglass braid and saturant



- Excellent flame retardance, resistance to acids, solvents and bases
- Good resistance to moisture and abrasion
- Good flexibility

Widely used in industrial applications such as steel, aluminum and glass plants. Also used in the heat treating industry, furnace surveys and temperature sensors.

Conductor		Insulation		Jacket		OD		Ship Wt	
AWG	MM <sup>2</sup>	Inches	MM	Inches	MM	Inches	MM	Lbs/MF	Kg/Km
24	0.51	0.010	0.25	0.010	0.25	.060 x .100	1.52 x 2.54	5	7
22	0.64	0.010	0.25	0.010	0.25	.065 x .110	1.65 x 2.79	6	9
20	0.81	0.010	0.25	0.010	0.25	.072 x .124	1.83 x 3.15	9	13
18	1.02	0.010	0.25	0.010	0.25	.080 x .140	2.03 x 3.56	15	22
16	1.29	0.010	0.25	0.010	0.25	.090 x .160	2.29 x 4.06	23	34

24(7)	0.61	0.010	0.25	0.010	0.25	.064 x .108	1.63 x 2.74	5	7
20(7)	0.97	0.010	0.25	0.010	0.25	.076 x .132	1.93 x 3.35	9	13
16(7)	1.47	0.010	0.25	0.010	0.25	.098 x .176	2.49 x 4.47	23	34

Conductor insulation and overall jacket are color coded per ANSI MC 96.1 and ASTM E230. International color codes available on request.

Available in standard and special limits of error per ANSI MC 96.1, ASTM E230 and IEC 584

Stainless Steel, Inconel, or Tin Plated Copper overbraid is available on request



# THERMOCOUPLE WIRE

Vitreous Silica Braid Insulation  
 Vitreous Silica Braid Jacket

1600°F 871°C Continuous 2000°F 1093°C Single Reading

## Product Description



Conductor: Thermocouple wire per ANSI MC 96.1 & ASTM E230  
 (Solid or stranded available)

Insulation: Vitreous Silica braid

Jacket: Vitreous Silica braid



- Excellent flame retardance and resistance to elevated temperatures
- Poor resistance to moisture and abrasion

Widely used in industrial applications such as steel, aluminum and glass plants. Also used in the heat treating industry and furnace surveys.

Conductor		Insulation		Jacket		OD		Ship Wt	
AWG	MM <sup>2</sup>	Inches	MM	Inches	MM	Inches	MM	Lbs/MF	Kg/Km
24	0.51	0.015	0.38	0.015	0.38	.080 x .130	2.0 x 3.3	5	7
22	0.64	0.015	0.38	0.015	0.38	.085 x .140	2.2 x 3.6	6	9
20	0.81	0.015	0.38	0.015	0.38	.092 x .154	2.3 x 3.9	10	15
18	1.02	0.015	0.38	0.015	0.38	.100 x .170	2.5 x 4.3	15	22
16	1.29	0.015	0.38	0.015	0.38	.111 x .192	2.8 x 4.9	24	36

24(7)	0.61	0.015	0.38	0.015	0.38	.084 x .138	2.1 x 3.5	5	7
20(7)	0.97	0.015	0.38	0.015	0.38	.096 x .162	2.4 x 4.1	10	15
16(7)	1.47	0.015	0.38	0.015	0.38	.118 x .206	3.0 x 5.2	24	36

Negative conductors is color coded with a tracer per ANSI MC 96.1 and ASTM E230.  
 International color codes available on request.

Available in standard and special limits of error per ANSI MC 96.1, ASTM E230 and IEC 584





# THERMOCOUPLE WIRE

Ceramic Fiber Braid Insulation  
Ceramic Fiber Braid Jacket

2200°F 1204°C Continuous 2600°F 1427°C Single Reading

## Product Description



Conductor: Thermocouple wire per ANSI MC 96.1 & ASTM E230  
(Solid or stranded available)

Insulation: Ceramic Fiber braid

Jacket: Ceramic Fiber braid

- Excellent flame retardance
- Excellent resistance to elevated temperatures
- Good resistance to abrasion



Widely used in industrial applications such as steel, aluminum, glass plants and the production of metals. Also used in the heat treating industry, furnace surveys and beaded thermocouple replacement

Conductor		Insulation		Jacket		OD		Ship Wt	
AWG	MM <sup>2</sup>	Inches	MM	Inches	MM	Inches	MM	Lbs/MF	Kg/Km
24	0.51	0.014	0.36	0.014	0.36	.076 x .124	1.9 x 3.2	6	9
22	0.64	0.014	0.36	0.014	0.36	.081 x .135	2.1 x 3.4	7	10
20	0.81	0.014	0.36	0.014	0.36	.088 x .148	2.2 x 3.8	11	16
18	1.02	0.014	0.36	0.014	0.36	.096 x .164	2.4 x 4.2	16	24
16	1.29	0.014	0.36	0.014	0.36	.107 x .186	2.7 x 4.7	25	37

24(7)	0.61	0.014	0.36	0.014	0.36	.080 x .132	2.0 x 3.4	6	9
20(7)	0.97	0.014	0.36	0.014	0.36	.092 x .156	2.3 x 4.0	11	16
16(7)	1.47	0.014	0.36	0.014	0.36	.114 x .200	2.9 x 5.0	25	37

Available in standard and special limits of error per ANSI MC 96.1, ASTM E230 and IEC 584

Stainless Steel, Inconel, or Tin Plated Copper overbraid is available on request



# THERMOCOUPLE WIRE

Polyimide Insulation  
Polyimide Jacket

600°F 316°C Continuous 800°F 427°C Single Reading

## Product Description



Conductor: Thermocouple wire per ANSI MC 96.1 & ASTM E230  
(Solid or stranded available)

Insulation: Fused polyimide tape

Jacket: Fused polyimide tape



- Excellent flame retardance and chemical resistance
- Excellent resistance to acids, solvents, radiation and abrasion
- Good resistance to moisture

Widely used in petrochemical facilities, the aerospace industry and also in electrical generating facilities. Also provides stability in low temperature applications.

Conductor		Insulation		Jacket		OD		Ship Wt	
AWG	MM <sup>2</sup>	Inches	MM	Inches	MM	Inches	MM	Lbs/MF	Kg/Km
24	0.51	0.006	.15	0.006	.15	.080 x .130	2.0 x 3.3	4	6
22	0.64	0.006	.15	0.006	.15	.085 x .141	2.2 x 3.6	6	9
20	0.81	0.006	.15	0.006	.15	.092 x .154	2.3 x 3.9	9	13
18	1.02	0.006	.15	0.006	.15	.100 x .170	2.5 x 4.3	14	21
16	1.29	0.006	.15	0.006	.15	.111 x .192	2.8 x 4.9	20	30

24(7)	0.61	0.006	.15	0.006	.15	.084 x .138	2.1 x 3.5	4	6
20(7)	0.97	0.006	.15	0.006	.15	.096 x .162	2.4 x 4.1	9	13
16(7)	1.47	0.006	.15	0.006	.15	.119 x .208	3.0 x 5.3	20	30

Conductor insulation is color coded per ANSI MC 96.1 and ASTM E230.  
International color codes available on request.

Available in standard and special limits of error per ANSI MC 96.1, ASTM E230 and IEC 584

Stainless Steel, Inconel, or Tin Plated Copper overbraid is available on request



# THERMOCOUPLE WIRE

PTFE Insulation  
PTFE Jacket

500°F 260°C Continuous 600°F 316°C Single Reading

## Product Description



Conductor: Thermocouple wire per ANSI MC 96.1 & ASTM E230  
(Solid or stranded available)

Insulation: Fused PTFE tape

Jacket: Fused PTFE tape



- Excellent flame retardance and chemical resistance
- Excellent resistance to acids, solvents and moisture
- Excellent resistance to abrasion

Widely used in petrochemical facilities, the aerospace industry and also in temperature sensors. Also provides stability in low temperature applications.

Conductor		Insulation		Jacket		OD		Ship Wt	
AWG	MM <sup>2</sup>	Inches	MM	Inches	MM	Inches	MM	Lbs/MF	Kg/Km
24	0.51	0.006	.15	0.006	.15	.080 x .130	2.0 x 3.3	4	6
22	0.64	0.006	.15	0.006	.15	.085 x .141	2.2 x 3.6	6	9
20	0.81	0.006	.15	0.006	.15	.092 x .154	2.3 x 3.9	9	13
18	1.02	0.006	.15	0.006	.15	.100 x .170	2.5 x 4.3	14	21
16	1.29	0.006	.15	0.006	.15	.111 x .192	2.8 x 4.9	20	30

24(7)	0.61	0.006	.15	0.006	.15	.084 x .138	2.1 x 3.5	4	6
20(7)	0.97	0.006	.15	0.006	.15	.096 x .162	2.4 x 4.1	9	13
16(7)	1.47	0.006	.15	0.006	.15	.119 x .208	3.0 x 5.3	20	30

Conductor insulation and overall jacket are color coded per ANSI MC 96.1 and ASTM E230.  
International color codes available on request.

Available in standard and special limits of error per ANSI MC 96.1, ASTM E230 and IEC 584

Stainless Steel, Inconel, or Tin Plated Copper overbraid is available on request



# THERMOCOUPLE WIRE

PFA Insulation  
PFA Jacket

500°F 260°C Continuous 550°F 290°C Single Reading

## Product Description



Conductor: Thermocouple wire per ANSI MC 96.1 & ASTM E230  
(Solid or stranded available)

Insulation: Extruded PFA

Jacket: Extruded PFA



- Excellent flame retardance and chemical resistance
- Excellent resistance to acids, solvents, and abrasion
- Good resistance to moisture

Widely used in petrochemical facilities, the aerospace industry and also in electrical generating facilities. Also provides stability in low temperature applications.

Available in single and multi twisted shielded pair constructions.

Conductor		Insulation		Jacket		OD		Ship Wt	
AWG	MM <sup>2</sup>	Inches	MM <sup>2</sup>	Inches	MM <sup>2</sup>	Inches	MM <sup>2</sup>	Lbs/M	KG/M
24	0.51	0.008	0.20	0.010	0.25	.056 x .092	1.4 x 2.3	5	7
22	0.64	0.008	0.20	0.010	0.25	.061 x .102	1.5 x 2.6	7	10
20	0.81	0.008	0.20	0.010	0.25	.068 x .116	1.7 x 2.9	10	15
18	1.02	0.008	0.20	0.010	0.25	.076 x .132	1.9 x 3.4	15	22
16	1.29	0.008	0.20	0.010	0.25	.087 x .154	2.2 x 3.9	22	33

24(7)	0.61	0.008	0.20	0.010	0.25	.060 x .100	1.6 x 2.7	6	8
20(7)	0.97	0.008	0.20	0.010	0.25	.072 x .124	1.8 x 3.1	11	16
16(7)	1.47	0.008	0.20	0.010	0.25	.094 x .168	2.4 x 4.3	22	33

Conductor insulation and overall jacket are color coded per ANSI MC 96.1 and ASTM E230. International color codes available on request.

Available in standard and special limits of error per ANSI MC 96.1, ASTM E230 and IEC 584

Stainless Steel, Inconel, or Tin Plated Copper overbraid is available on request



# THERMOCOUPLE WIRE

FEP Insulation  
FEP Jacket

392°F 200°C Continuous 500°F 260°C Single Reading

## Product Description



Conductor: Thermocouple wire per ANSI MC 96.1 & ASTM E230  
(Solid or stranded available)

Insulation: Extruded FEP

Jacket: Extruded FEP



- Excellent flame retardance and chemical resistance
- Excellent resistance to acids, solvents and moisture
- Excellent resistance to abrasion

Widely used in petrochemical facilities, the aerospace industry and also in temperature sensors. Also provides stability in low temperature applications.

Available in single and multi twisted shielded pair constructions.

Conductor		Insulation		Jacket		OD		Ship Wt	
AWG	MM <sup>2</sup>	Inches	MM	Inches	MM	Inches	MM	Lbs/MF	Kg/Km
24	0.51	0.008	0.20	0.010	0.25	.056 x .092	1.4 x 2.3	5	7
22	0.64	0.008	0.20	0.010	0.25	.061 x .102	1.5 x 2.6	7	10
20	0.81	0.008	0.20	0.010	0.25	.068 x .116	1.7 x 2.9	10	15
18	1.02	0.008	0.20	0.010	0.25	.076 x .132	1.9 x 3.4	15	22
16	1.29	0.008	0.20	0.010	0.25	.087 x .154	2.2 x 3.9	22	33

24(7)	0.61	0.008	0.20	0.010	0.25	.060 x .100	1.6 x 2.7	6	8
20(7)	0.97	0.008	0.20	0.010	0.25	.072 x .124	1.8 x 3.1	11	16
16(7)	1.47	0.008	0.20	0.010	0.25	.094 x .168	2.4 x 4.3	22	33

Conductor insulation and overall jacket are color coded per ANSI MC 96.1 and ASTM E230. International color codes available on request.

Available in standard and special limits of error per ANSI MC 96.1, ASTM E230 and IEC 584

Stainless Steel, Inconel, or Tin Plated Copper overbraid is available on request





# THERMOCOUPLE WIRE

Silicone Rubber Fiberglass Braid Insulation  
Fiberglass Braid Jacket

392°F 200°C Continuous 500°F 260°C Single Reading

## Product Description



**Conductor:** Thermocouple wire per ANSI MC 96.1 & ASTM E230  
(Solid or stranded available)



**Insulation:** Extruded silicone rubber with a fiberglass braid and saturant

**Jacket:** Fiberglass braid with a saturant



- Good flame retardance and moisture resistance
- Excellent flexibility
- Provides circuit integrity when exposed to fire/flame
- Available with an optional Silicone rubber jacket in place of the fiberglass braid
- Available with an optional FEP extrusion over the inner braid to provide oil and chemical resistance.

Used in applications requiring increased flexibility. Also used in environments that require functionality when exposed to catastrophic fire (Circuit Integrity).

Conductor		Insulation		Jacket		OD		Ship Wt	
AWG	MM <sup>2</sup>	Inches	MM	Inches	MM	Inches	MM	Lbs/MF	Kg/Km
24	0.51	0.015	.38	0.005	0.13	.070 x .130	1.8 x 3.3	6	9
22	0.64	0.015	.38	0.005	0.13	.075 x .140	1.9 x 3.6	8	12
20	0.81	0.015	.38	0.005	0.13	.082 x .154	2.1 x 3.9	12	18
18	1.02	0.015	.38	0.005	0.13	.090 x .170	2.3 x 4.3	16	24
16	1.29	0.015	.38	0.005	0.13	.101 x .192	2.6 x 4.9	22	34

24(7)	0.61	0.015	.38	0.005	0.13	.074 x .138	1.9 x 3.5	7	10
20(7)	0.97	0.015	.38	0.005	0.13	.086 x .162	2.2 x 4.1	13	19
16(7)	1.47	0.015	.38	0.005	0.13	.108 x .206	2.7 x 5.2	23	35

Conductor insulation and overall jacket are color coded per ANSI MC 96.1 and ASTM E230. International color codes available on request.

Available in standard and special limits of error per ANSI MC 96.1, ASTM E230 and IEC 584

Stainless Steel, Inconel, or Tin Plated Copper overbraid is available on request



# THERMOCOUPLE WIRE

PVC Insulation  
PVC Jacket

221°F 105°C Continuous

## Product Description



Conductor: Thermocouple wire per ANSI MC 96.1 & ASTM E230  
(Solid or stranded available)

Insulation: Extruded PVC

Jacket: Extruded PVC



- Good flame retardance and chemical resistance
- Good resistance to acids, moisture and abrasion
- Excellent flexibility

Widely used in all industry for extension grade applications and temperature sensors.  
Available with PLTC rating in single pair and multi pair constructions

Conductor		Insulation		Jacket		OD		Ship Wt	
AWG	MM <sup>2</sup>	Inches	MM	Inches	MM	Inches	MM	Lbs/MF	Kg/Km
24	0.51	0.015	.38	0.015	.38	.080 x .130	2.0 x 3.3	7	10
22	0.64	0.015	.38	0.015	.38	.085 x .140	2.2 x 3.6	9	13
20	0.81	0.015	.38	0.015	.38	.092 x .154	2.3 x 3.9	12	18
18	1.02	0.015	.38	0.015	.38	.100 x .170	2.5 x 4.3	16	24
16	1.29	0.015	.38	0.015	.38	.111 x .192	2.8 x 4.9	23	35

24(7)	0.61	0.015	.38	0.015	.38	.084 x .138	2.1 x 3.5	8	11
20(7)	0.97	0.015	.38	0.015	.38	.096 x .162	2.4 x 4.1	13	19
16(7)	1.47	0.015	.38	0.015	.38	.118 x .206	3.0 x 5.2	24	36

Conductor insulation and overall jacket are color coded per ANSI MC 96.1 and ASTM E230.  
International color codes available on request.

Available in standard and special limits of error per ANSI MC 96.1, ASTM E230 and IEC 584

Stainless Steel, Inconel, or Tin Plated Copper overbraid is available on request

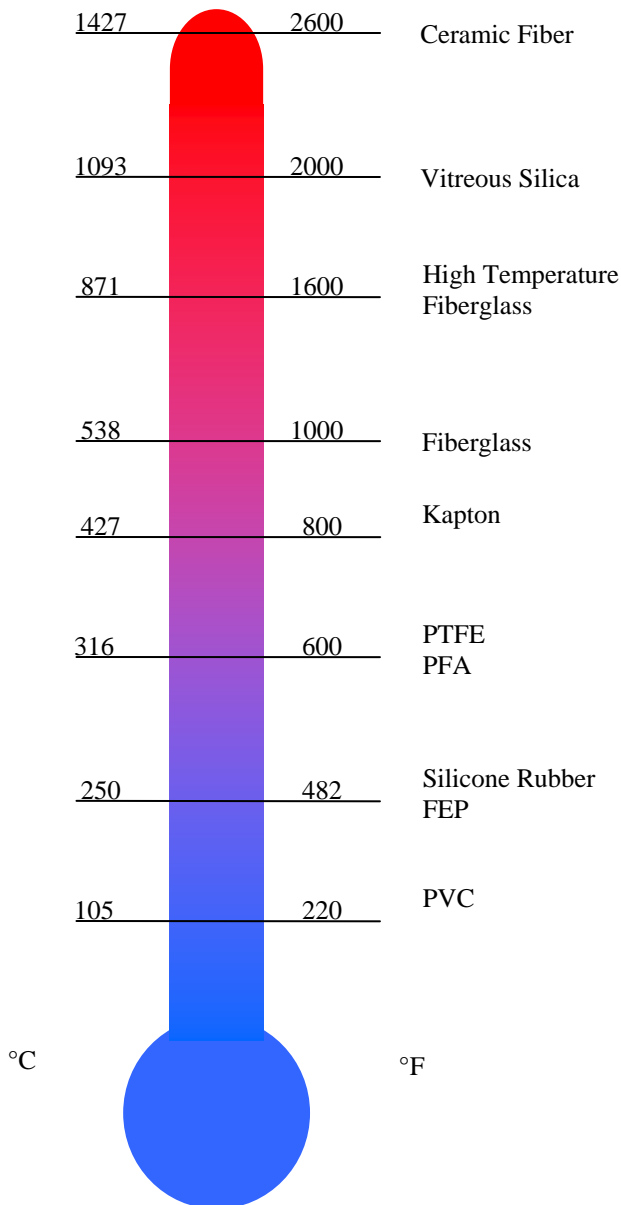


## Quality Control

All First Capitol Wire & Cable products are manufactured using quality materials and workmanship to adhere to the established high standards of industrial specifications. All thermocouple wire and extension wire products shipped are in accordance with procedures per NBS circular 590 and all testing has NBS traceability.

## Packaging

Standard lengths are 1000 foot spools or reels subject to  $\pm 10\%$  on each put-up. However, each reel, spool and the container in which it is shipped is marked with the exact length contained. On any order, unless previously agreed otherwise, we reserve the right to furnish plus or minus up to 10% of the total quantity ordered. Standard terms and conditions apply.



Wire Size (AWG)	Diameter	
	Inches	mm
000	.410	10.40
00	.365	9.27
0	.325	8.25
1	.289	7.35
2	.258	6.54
3	.229	5.83
4	.204	5.19
5	.182	4.62
6	.162	4.12
7	.144	3.67
8	.128	3.26
9	.114	2.91
10	.102	2.59
11	.091	2.31
12	.081	2.05
13	.072	1.83
14	.064	1.63
15	.057	1.46
16	.051	1.29
17	.045	1.15
18	.040	1.02
19	.036	0.912
20	.032	0.812
21	.0285	0.723
22	.0253	0.644
23	.0226	0.573
24	.0201	0.511
25	.0179	0.455
26	.0159	0.405
27	.0142	0.361
28	.0126	0.321
29	.0113	0.286
30	.0100	0.255
32	.0080	0.202
34	.0063	0.160
36	.0050	0.127
38	.0040	0.102
40	.0031	0.079