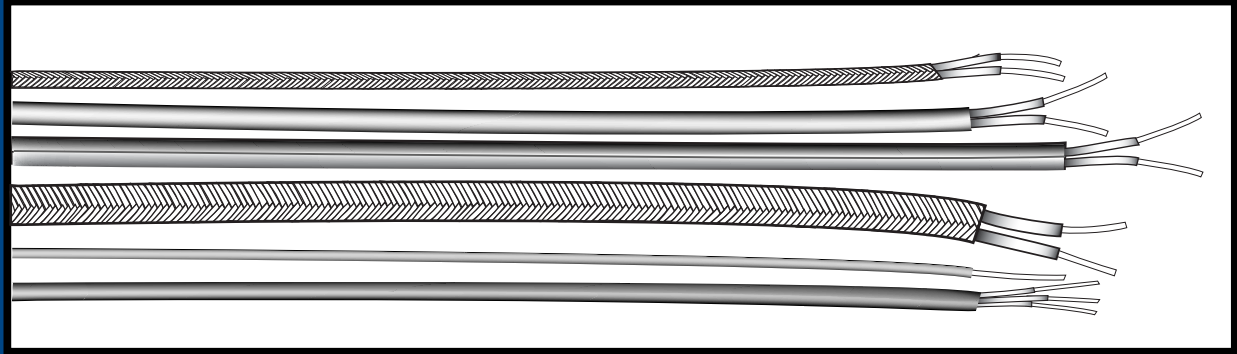


# SECTION 4

# WIRE



## WIRE INDEX - SECTION 4

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## Technical Information

Thermocouple wire and thermocouple extension wire is normally ordered and specified by ANSI letter designations for wire. Positive and negative legs are identified by suffixes P (positive) and N (negative).

ANSI LETTER	LEGS-POSITIVE AND NEGATIVE	TRADE NAMES
B	BP BN	Platinum 30% Rhodium Platinum 6% Rhodium
C**	CP CN	W5Re (Tungsten 5% Rhenium) W2Re (Tungsten 26% Rhenium)
E	EP EN	Chromel*, Tophel*, Hai-Kp* Constantan, Cupron*, Advance*
J	JP JN	Iron Constantan, Cupron*, Advance*
K	KP KN	Chromel*, Tophel*, Hai-Kp* Alumel*, Nial*, Hai-Kn*
N	NP NN	Nicrosil Nisil
R	RP RN	Platinum 13% Rhodium Pure Platinum
S	SP SN	Platinum 10% Rhodium Pure Platinum
T	TP TN	Copper Constantan, Cupron*, Advance*

\*\*Not an ANSI symbol

\*Cupron, NIAL and Tophel are registered trademarks of Carpenter Technology.

\*Advance, HAI-KP and HAI-KN are registered trademarks of Harrison Alloys Co.

\*Chromel and Alumel are registered trademarks of Hoskins Manufacturing Co.

## Tolerances

Unless otherwise specified, all thermocouple wire and extension wire is supplied to meet tolerances for standard limits and special limits of error as per ANSI MC96.1. The standard and special tolerances for thermocouple and extension wire is given in the following tables. Where tolerances are given in percentages, the percentage applies to the temperature being measured.

### Initial Calibration Tolerances for Wire and Cable

Reference Junction 32 Deg. F (0 Deg. C)

CALIBRATION	TEMPERATURE RANGE		TOLERANCES (WHICHEVER IS GREATER)	
	DEG. F	DEG. C	STANDARD	SPECIAL
<b>Thermocouple Grade Wire</b>				
B	1598 to 3092	870 to 1700	+/- 0.5%	
E	32 to 1652	0 to 900	+/-1.7 C or +/-0.5%	+/-1.0 C or +/-0.4%
J	32 to 1382	0 to 750	+/-2.2 C or +/-0.75%	+/-1.1 C or +/-0.4%
K	32 to 2282	0 to 1250	+/-2.2 C or +/-0.75%	+/-1.1 C or +/-0.4%
N	32 to 2282	0 to 1250	+/-2.2 C or +/-0.75%	+/-1.1 C or +/-0.4%
R or S	32 to 2642	0 to 1450	+/-1.5 C or +/-0.25%	+/-0.6 C or +/-0.1%
T	32 to 662	70 to 350	+/-1.0 C or +/-0.75%	+/-0.5 C or +/-0.4%
<b>Extension Grade Wire</b>				
EX	32 to 392	0 to 200	+/-1.7 C	+/-1.0 C
JX	32 to 392	0 to 200	+/-2.2 C	+/-1.1 C
KX	32 to 392	0 to 200	+/-2.2 C	+/-1.1 C
NX	32 to 392	0 to 200	+/-2.2 C	+/-1.1 C
TX	32 to 212	0 to 100	+/-1.0 C	+/-0.5 C
<b>Compensating Extension Wire</b>				
BX*	32 to 392 +	0 to 200	+/-3.7 C	
CX**	32 to 1600 +	0 to 870	+/-6.8 C	
RX, SX***	32 to 392 +	0 to 200	+/-5.0 C	
<b>Cryogenic Range Wire</b>				
E****	-328 to 32	-200 to 0	+/-1.7 C or +/- 1%	++
K****	-328 to 32	-200 to 0	+/-2.2 C or +/- 2%	++
T****	-328 to 32	-200 to 0	+/-1.0 C or +/- 1.5%	++

See Notes Following Page.

## Notes

\*Copper vs. Copper compensating extension wire-maximum temperature of 212°F, with maximum deviations shown but with no significant deviation over 32°F to 122°F range. Matched compensating wire is available for use over the range of 32°F to 392°F with tolerances of +/-0.033mV (+/-3.7 C ++).

\*\*Not an ANSI Symbol

\*\*\*Copper (+) Versus copper nickel alloy (-).

\*\*\*\* Thermocouple materials are normally supplied to meet tolerances specified in the table for the normal specified range. The same materials may not fall within the cryogenic tolerances in the second section of the table. If materials are required to meet the cryogenic tolerances, the specifications must indicate this. Selection of materials usually will be required. Tolerances shown in the table are not necessarily an indication of the accuracy of measurements in use after initial heating of the material.

++ Information is limited that would justify establishing special tolerances for cryogenic temperatures. Experience suggests the following tolerances for Type E and T thermocouples:

Type E -200° to 0° C +/-0.0°C or 0.5% (whichever is greater)  
 Type T -200° to 0° C +/-0.5°C or +/-0.8% (whichever is greater)

These tolerances are given only as a guide for discussion. Due to the characteristics of the material, cryogenic tolerances for Type J thermocouples and special cryogenic tolerances for Type K thermocouples are not listed.

+ Type B, C, R, and S thermocouple alloys possess non-linear temperature-EMF curves. Because of this non-linearity, the error introduced into a thermocouple system by the compensating wire will be variable when expressed in degrees. The degree C tolerances given are based on the following measuring junction temperatures:

Wire Type	Measuring Junction Temperature
BX	Greater than 1832°F (1000°C)
SX	Greater than 1598°F (870°C)

## ANSI Color Codes As Per MC96.1

CONDUCTORS/ JACKET	EXT. OR T/C GRADE	TYPE B	TYPE E	TYPE J	TYPE K	TYPE N	TYPE R	TYPE S	TYPE T
Jacket Positive Leg Negative Leg	T/C Grade	None None None	Brown Purple Red	Brown White Red	Brown Yellow Red	Brown Orange Red	None None None	None None None	Brown Blue Red
Jacket Positive Leg Negative Leg	Ext. Grade	Gray Gray Red	Purple Purple Red	Black White Red	Yellow Yellow Red	Orange Orange Red	Green Black Red	Green Black Red	Blue Blue Red

## Solid And Stranded Conductors

Thermocouple wire and extension wire is normally supplied with solid conductors; however, when greater flexibility is required, stranded wire is available. Stranded wire is recommended when flexibility is a major concern.

### Conductor Sizes

B & S WIRE GAUGE	SOLID CONDUCTOR	STRANDED CONDUCTOR		
	DIAMETER	DIAMETER	NUMBER OF STRANDS	STRAND GAUGE
14	0.064"	0.076"	7	22
16	0.051"	0.060"	7	24
20	0.032"	0.038"	7	28
24	0.020"	0.024"	7	32

## Long Leadwire For Thermocouples

Long leadwire runs make conductor resistance an important consideration in the selection of the wire gauge suitable for the particular application. The table below shows the minimal ohms per double foot for thermocouple grade and extension wire. Ohms per double foot is the total resistance in ohms for both conductors per foot.

### Nominal Resistance/Ohms Per Double Foot @ 20 Deg. C

B & S GAUGE	DIA.	BX	CX*	E	J	K	N	RX/SX	T
14	0.064	0.024	0.093	0.177	0.091	0.147	0.195	0.010	0.048
16	0.051	0.039	0.147	0.281	0.145	0.233	0.3310	0.016	0.120
20	0.032	0.098	0.372	0.709	0.367	0.589	0.783	0.040	0.304
24	0.020	0.248	0.941	1.795	0.928	1.490	1.980	1.100	0.768
14 Stranded	0.076	0.022	0.085	0.161	0.083	0.134	0.178	0.009	0.069
16 Stranded	0.060	0.035	0.134	0.256	0.133	0.213	0.283	0.014	0.110
20 Stranded	0.038	0.090	0.340	0.648	0.335	0.538	0.715	0.036	0.277
24 Stranded	0.024	0.227	0.859	1.639	0.848	1.361	1.808	0.091	0.701

## Thermocouple Grade And Extension Wire Selection

There are profound differences in thermocouple grade wire and extension grade wire. Thermocouple grade wire is used to actually measure temperature where extension grade wire is used to carry the millivolt signal to the instrumentation.

Thermocouple extension grade wire is calibrated to a maximum temperature of 400 degrees F. The insulations used on some extension grade wire has temperature ratings above this 400 degree F range. This is to allow the wire to survive in the event it comes into contact with furnace walls and/or parts above this 400 degree F temperature.

Wire constructions are rated for continuous service as well as for single reading applications. The continuous service is the highest temperature at which the particular insulation will survive indefinitely. The single reading temperature has been determined by actual testing of the wire. Each insulation will perform differently when exposed to the single reading temperature rating. Normally, the wire will produce accurate readings at the maximum single reading temperature; however, the wire will become less flexible and abrasion resistant.

### Recommended Upper Temperature Limits For B & S Wire Gauges

T/C TYPE	8 GAUGE	14 GAUGE	20 GAUGE	24 GAUGE
E	1600 Deg. F	1200 Deg. F	1005 Deg. F	805 Deg. F
J	1400 Deg. F	1085 Deg. F	895 Deg. F	700 Deg. F
K	2300 Deg. F	1995 Deg. F	1795 Deg. F	1600 Deg. F
N	2300 Deg. F	1995 Deg. F	1795 Deg. F	1600 Deg. F
T	-----	700 Deg. F	500 Deg. F	395 Deg. F

## Insulated Thermocouple Wire

### Insulation Specifications

CODE	SINGLE CONDUCTOR		DUPLEX CONDUCTORS		TEMPERATURE RATING		ANSI COLOR CODED	PHYSICAL CHARACTERISTICS			NOTES
	INSULATION	IMPREGNATION	INSULATION	IMPREGNATION	CONTINUOUS	SINGLE READING		ABRASION RESISTANCE	MOISTURE RESISTANCE	CHEMICAL RESISTANCE	
01	Vitreous Silica Fiber	None	Vitreous Silica Fiber	None	1600 F	2000 F	No	Fair	Fair	Fair	
02	Double Glass Braid	Modified Resin	Glass Braid	Modified Resin	900 F	1000 F	Yes	Good	Good	Good	1
03	Enamel/Glass Braid	Modified Resin	Glass Braid	Modified Resin	900 F	1000 F	Yes	Fair	Good	Good	1
04	Glass Braid	Modified Resin	Glass Braid	Modified Resin	900 F	1000 F	Yes	Fair	Good	Good	1
05	Double Glass Wrap	Modified Resin	Glass Braid	Modified Resin	900 F	1000 F	Yes	Fair	Good	Good	1
06	Glass Braid	None	Glass Braid	None	900 F	1000 F	No	Fair	Fair	Good	
07	High Temp. Glass Braid	None	HighTemp. Glass Braid	Modified Resin	1300 F	1600 F	Tracer Both Legs	Good	Fair	Good	1
08	High Temp. Glass Braid	None	HighTemp. Glass Braid	Light Lacquer Coating	1300 F	1600 F	No	Fair	Fair	Good	2
09	Glass Braid	Modified Resin	Glass Braid	Modified Resin	900 F	1000 F	Yes	Good	Good	Good	1
10	High Temp. Glass Braid	High Temp. Varnish	Twisted	N/A	1300 F	1600 F	Yes	Good	Good	Good	1
11	Glass Braid	Modified	Twisted	N/A	900 F	1000 F	Yes	Good	Good	Good	1
12	High Temp. Glass Braid	High Temp. Varnish	HighTemp. Glass Braid	High Temp. Varnish	1300 F	1600 F	Yes	Good	Good	Good	
13	Ceramic Fiber	None	Ceramic Fiber	None	2200 F	2600 F	No	Good	Fair	Good	
14	Polivinyll	None	Polyvinyl	None	221 F	221 F	Yes	Good	Excellent	Good	
15	Nylon	None	Nylon	None	300 F	300 F	Yes	Excellent	Fair	Good	
16	Polyvinyl	None	Ripcord	None	221 F	221 F	Yes	Good	Excellent	Good	
17	Extruded FEP	None	Extruded FEP	None	400 F	500 F	Yes	Excellent	Excellent	Excellent	
18	Fused TFE Tape	None	Fused TFE Tape	None	500 F	600 F	Yes	Good	Excellent	Excellent	
19	Extuded FEP	None	Extruded FEP Twisted	None	400 F	500 F	Yes	Excellent	Excellent	Excellent	3
20	Polyvinyl	None	Polyvinyl Twisted	None	221 F	221 F	Yes	Good	Excellent	Excellent	3
21	Fused Kapton	None	Fused Kapton	None	600 F	600 F	Yes	Excellent	Excellent	Excellent	4
22	PFA	None	PFA	None	500 F	550 F	Yes	Good	Excellent	Excellent	
23	PFA	None	PFA Twisted	None	500 F	550 F	Yes	Good	Excellent	Good	3
24	TFE Tape Coated Fiberglass	None	TFE Coated Glass Braid	None	900 F	1000 F	Yes	Good	Excellent	Excellent	5
25	Ceramic Fiber	None	Ceramic Fiber	None	2200 F	2600 F	No	Good	Fair	Good	

**NOTE 1:** Impregnation Maintained to 400°F.

**NOTE 2:** Coating Maintained to 400° F.

**NOTE 3:** Aluminum Polyester Shield With Drain Wire.

**NOTE 4:** FEP Binder Melts @ 500° F.

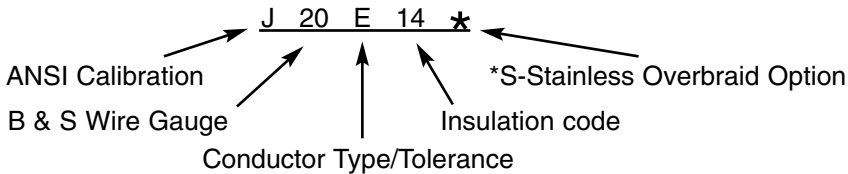
**NOTE 5:** TFE Good to 500°F

## Insulated Thermocouple Multipair Cable

CODE	SINGLE CONDUCTOR		DUPLEX CONDUCTOR		TEMPERATURE RATING		ANSI COLOR CODED	PHYSICAL CHARACTERISTICS			NOTES
	INSULATION	IMPREGNATION	INSULATION	IMPREGNATION	CONTINUOUS	SINGLE READING		ABRASION RESISTANCE	MOISTURE RESISTANCE	CHEMICAL RESISTANCE	
40	Polyvinyl	None	Polyvinyl	None	221 F	221 F	Yes	Good	Excellent	Excellent	Overall Aluminum/Polyester shield with drain wire.
41	Polyvinyl	None	Polyvinyl	None	221 F	221 F	Yes	Good	Excellent	Excellent	Each pair shielded & overall shielded with Aluminum/Polyester with drain.

\*\*Special constructions Are Available. Consult TMS.

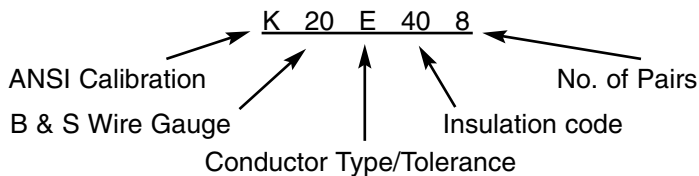
### Thermocouple Wire Ordering Information:



- A - Thermocouple Grade, Solid Conductors, Standard Tolerance
- B - Thermocouple Grade, Solid Conductors, Special Tolerance
- C - Thermocouple Grade, Stranded Conductors, Standard Tolerance
- D - Thermocouple Grade, Stranded Conductors, Special Tolerance
- E - Extension Grade, Solid Conductors, Standard Tolerance
- F - Extension Grade, Solid Conductors, Special Tolerance
- G - Extension Grade, Stranded Conductors, Standard Tolerance
- H - Extension Grade, Stranded Conductors, Special Tolerance

\*Other overbraid materials are available on request. Consult TMS.

### Multipair Cable Ordering Information:



- E - Extension Grade, Solid Conductors, Standard Tolerance
- F - Extension Grade, Solid Conductors, Special Tolerance

## Standard Construction - Thermocouple Grade

PART NUMBER	B & S WIRE GAUGE	CONDUCTOR DIAMETER	LBS. PER 1000 FT.	T/C OR EXT. GRADE/ CONDUCTOR TYPE	OVERBRAID AVAILABLE
E20A04	20	0.032"	9 Lbs/M	Thermocouple Solid	Yes
E20B04	20	0.032	9 Lbs/M	Thermocouple Solid	Yes
E20A12	20	0.032	13 Lbs/M	Thermocouple Solid	Yes
E20A18	20	0.032	11 Lbs/M	Thermocouple Solid	Yes
E20A22	20	0.032	12 Lbs/M	Thermocouple Solid	Yes
E20A23	20	0.032	18 Lbs/M	Thermocouple Solid	Yes
J14A07	14	0.064	36 Lbs/M	Thermocouple Solid	Yes
J14B07	14	0.064	36 Lbs/M	Thermocouple Solid	Yes
J16A09	16	0.051	22 Lbs/M	Thermocouple Solid	Yes
J16A17	16	0.051	28 Lbs/M	Thermocouple Solid	Yes
J20A04	20	0.032	9 Lbs/M	Thermocouple Solid	Yes
J20B04	20	0.032	9 Lbs/M	Thermocouple Solid	Yes
J20A05	20	0.032	6 Lbs/M	Thermocouple Solid	Yes
J20B05	20	0.032	6 Lbs/M	Thermocouple Solid	Yes
J20A10	20	0.032	10 Lbs/M	Thermocouple Solid	Yes
J20B10	20	0.032	10 Lbs/M	Thermocouple Solid	Yes
J20A11	20	0.032	10 Lbs/M	Thermocouple Solid	Yes
J20B11	20	0.032	10 Lbs/M	Thermocouple Solid	Yes
J20A12	20	0.032	13 Lbs/M	Thermocouple Solid	Yes
J20B12	20	0.032	13 Lbs/M	Thermocouple Solid	Yes
J20A17	20	0.032	12 Lbs/M	Thermocouple Solid	Yes
J20B17	20	0.032	12 Lbs/M	Thermocouple Solid	Yes
J20A18	20	0.032	11 Lbs/M	Thermocouple Solid	Yes
J20B18	20	0.032	11 Lbs/M	Thermocouple Solid	Yes
J20A19	20	0.032	18 Lbs/M	Thermocouple Solid	Yes
J20B19	20	0.032	18 Lbs/M	Thermocouple Solid	Yes
J20A22	20	0.032	12 Lbs/M	Thermocouple Solid	Yes
J20A23	20	0.032	18 Lbs/M	Thermocouple Solid	Yes
J20C02	20 (7/28)	0.038	10 Lbs/M	Thermocouple Stranded	Yes
J20C17	20 (7/28)	0.038	12 Lbs/M	Thermocouple Stranded	Yes
K14A07	14	0.064	36 Lbs/M	Thermocouple Solid	Yes
K14B07	14	0.064	36 Lbs/M	Thermocouple Solid	Yes
K16A09	16	0.051	22 Lbs/M	Thermocouple Solid	Yes
K20A01	20	0.032	15 Lbs/M	Thermocouple Solid	Yes
K20B01	20	0.032	15 Lbs/M	Thermocouple Solid	Yes
K20A04	20	0.032	9 Lbs/M	Thermocouple Solid	Yes
K20B04	20	0.032	9 Lbs/M	Thermocouple Solid	Yes
K20A05	20	0.032	9 Lbs/M	Thermocouple Solid	Yes
K20B05	20	0.032	9 Lbs/M	Thermocouple Solid	Yes
K20A08	20	0.032	15 Lbs/M	Thermocouple Solid	Yes
K20B08	20	0.032	15 Lbs/M	Thermocouple Solid	Yes
K20A09	20	0.032	12 Lbs/M	Thermocouple Solid	Yes
K20B09	20	0.032	12 Lbs/M	Thermocouple Solid	Yes

## Standard Construction - Thermocouple Grade

PART NUMBER	B & S WIRE GAUGE	CONDUCTOR DIAMETER	LBS. PER 1000 FT.	T/C OR EXT. GRADE/ CONDUCTOR TYPE	OVERBRAID AVAILABLE
K20A10	20	0.032"	10 Lbs/M	Thermocouple Solid	Yes
K20B10	20	0.032	10 Lbs/M	Thermocouple Solid	Yes
K20A12	20	0.032	13 Lbs/M	Thermocouple Solid	Yes
K20B12	20	0.032	13 Lbs/M	Thermocouple Solid	Yes
K20A13	20	0.032	16 Lbs/M	Thermocouple Solid	Yes
K20B13	20	0.032	16 Lbs/M	Thermocouple Solid	Yes
K20A17	20	0.032	12 Lbs/M	Thermocouple Solid	Yes
K20B17	20	0.032	12 Lbs/M	Thermocouple Solid	Yes
K20A18	20	0.032	11 Lbs/M	Thermocouple Solid	Yes
K20B18	20	0.032	11 Lbs/M	Thermocouple Solid	Yes
K20A19	20	0.032	18 Lbs/M	Thermocouple Solid	Yes
K20B19	20	0.032	18 Lbs/M	Thermocouple Solid	Yes
K20A22	20	0.032	12 Lbs/M	Thermocouple Solid	Yes
K20A23	20	0.032	12 Lbs/M	Thermocouple Solid	Yes
K20B21	20	0.032	8 Lbs/M	Thermocouple Solid	Yes
K20C02	20 (7/28)	0.039	10 Lbs/M	Thermocouple Stranded	Yes
K20B02	20 (7/28)	0.039	10 Lbs/M	Thermocouple Stranded	Yes
K20C17	20 (7/28)	0.039	10 Lbs/M	Thermocouple Stranded	Yes
N20A04	20	0.032	9 Lbs/M	Thermocouple Solid	Yes
N20B01	20	0.032	15 Lbs/M	Thermocouple Solid	Yes
T20A04	20	0.032	9 Lbs/M	Thermocouple Solid	Yes
T20B04	20	0.032	9 Lbs/M	Thermocouple Solid	Yes
T20A05	20	0.032	9 Lbs/M	Thermocouple Solid	Yes
T20B05	20	0.032	9 Lbs/M	Thermocouple Solid	Yes
T20A17	20	0.032	12 Lbs/M	Thermocouple Solid	Yes
T20B17	20	0.032	12 Lbs/M	Thermocouple Solid	Yes
T20A18	20	0.032	11 Lbs/M	Thermocouple Solid	Yes
T20A18	20	0.032	11 Lbs/M	Thermocouple Solid	Yes
T20A19	20	0.038	18 Lbs/M	Thermocouple Solid	Yes
T20B19	20	0.038	18 Lbs/M	Thermocouple Solid	Yes
T20A22	20	0.032	23 Lbs/M	Thermocouple Solid	Yes
T20A23	20	0.032	18 Lbs/M	Thermocouple Solid	Yes
T20B21	20	0.032	10 Lbs/M	Thermocouple Solid	Yes

\*\*14, 16 and 20 gauge wire cataloged. Some insulations also available in 24, 30, and 36 gauge sizes. Consult TMS for availability on these sizes.

## Standard Construction - Extension Grade

PART NUMBER	B & S WIRE GAUGE	CONDUCTOR DIAMETER	LBS. PER 1000 FT.	T/C OR EXT. GRADE/ CONDUCTOR TYPE	OVERBRAID AVAILABLE
B20E04	20	0.032	9 Lbs/M	Extension Solid	Yes
C24E17	24	0.020	8 Lbs/M	Extension Solid	Yes
E16E14	16	0.051	28 Lbs/M	Extension Solid	Yes
E16E19	16	0.051	33 Lbs/M	Extension Solid	Yes
E16E20	16	0.051	39 Lbs/M	Extension Solid	Yes
E20E14	20	0.032	14 Lbs/M	Extension Solid	Yes
E20E20	20	0.032	22 Lbs/M	Extension Solid	Yes
J14E14	14	0.064	44 Lbs/M	Extension Solid	Yes
J14F14	14	0.064	44 Lbs/M	Extension Solid	Yes
J16E03	16	0.051	22 Lbs/M	Extension Solid	Yes
J16E14	16	0.051	28 Lbs/M	Extension Solid	Yes
J16F14	16	0.051	28 Lbs/M	Extension Solid	Yes
J16E19	16	0.051	33 Lbs/M	Extension Solid	Yes
J16E20	16	0.051	39 Lbs/M	Extension Solid	Yes
J20E14	20	0.032	14 Lbs/M	Extension Solid	Yes
J20F14	20	0.032	14Lbs/M	Extension Solid	Yes
J20E17	20	0.032	12 Lbs/M	Extension Solid	Yes
J20E20	20	0.032	22 Lbs/M	Extension Solid	Yes
J20F20	20	0.032	22 Lbs/M	Extension Solid	Yes
J20G14	20 (7/28)	0.038	16 Lbs/M	Extension Stranded	Yes
J20H14	20 (7/28)	0.038	16 Lbs/M	Extension Stranded	Yes
J20G20	20	0.032	24 Lbs/M	Extension Solid	Yes
K14E14	14	0.064	44 Lbs/M	Extension Solid	Yes
K16E03	16	0.051	22 Lbs/M	Extension Solid	Yes
K16E14	16	0.051	28 Lbs/M	Extension Solid	Yes
K16F14	16	0.051	28 Lbs/M	Extension Solid	Yes
K16E19	16	0.051	33 Lbs/M	Extension Solid	Yes
K16E20	16	0.051	39 Lbs/M	Extension Solid	Yes
K20E14	20	0.032	14 Lbs/M	Extension Solid	Yes
K20F14	20	0.032	14 Lbs/M	Extension Solid	Yes
K20E17	20	0.032	12 Lbs/M	Extension Solid	Yes
K20E20	20	0.032	22 Lbs/M	Extension Solid	Yes
K20F20	20	0.032	22 Lbs/M	Extension Solid	Yes
K20G14	20 (7/28)	0.038	16 Lbs/M	Extension Stranded	Yes
K20H14	20 (7/28)	0.038	16 Lbs/M	Extension Stranded	Yes
K20G20	20 (7/28)	0.038	24 Lbs/M	Extension Stranded	Yes
K20H20	20 (7/28)	0.038	24 Lbs/M	Extension Stranded	Yes
K20E14	20	0.032	14 Lbs/M	Extended Solid	Yes
K20E20	20	0.032	22 Lbs/M	Extended Solid	Yes

# WIRE



## Standard Construction - Extension Grade

PART NUMBER	B & S WIRE GAUGE	CONDUCTOR DIAMETER	LBS. PER 1000 FT.	T/C OR EXT. GRADE/ CONDUCTOR TYPE	OVERBRAID AVAILABLE
S16E09*	16	0.051	22 Lbs/M	Extension Solid	Yes
S16E14*	16	0.051	28 Lbs/M	Extension Solid	Yes
S16E17*	16	0.051	28 Lbs/M	Extension Solid	Yes
S16E20*	16	0.051	39 Lbs/M	Extension Solid	Yes
S20E04*	20	0.032	9 Lbs/M	Extension Solid	Yes
S20E14*	20	0.032	14 Lbs/M	Extension Solid	Yes
S20E17*	20	0.032	12 Lbs/M	Extension Solid	Yes
S20E20*	20	0.032	22 Lbs/M	Extension Solid	Yes
S24E04*	24	0.020	44 Lbs/M	Extension Solid	Yes
T16E14	16	0.051	28 Lbs/M	Extension Solid	Yes
T16F14	16	0.051	28 Lbs/M	Extension Solid	Yes
T16E19	16	0.051	33 Lbs/M	Extension Solid	Yes
T16E20	16	0.051	39 Lbs/M	Extension Solid	Yes
T26E14	20	0.032	14 Lbs/M	Extension Solid	Yes
T20F14	20	0.032	14 Lbs/M	Extension Solid	Yes
T20E20	20	0.032	22 Lbs/M	Extension Solid	Yes
T20F20	20	0.032	22 Lbs/M	Extension Solid	Yes
T20G14	20 (7/28)	0.038	16 Lbs/M	Extension Solid	Yes
T20H14	20 (7/28)	0.038	16 Lbs/M	Extension Solid	Yes

\*Extension wire for ANSI Type B, R, and S Thermocouples

## Standard Construction - Multipair Cable

PART NUMBER	B & S WIRE GAUGE	APPROXIMATE DIAMETER	LBS. PER 1000 FT.	CONDUCTOR DESCRIPTION AND NUMBER OF PAIRS	ANSI COLOR CODES
J20E402 +	20	0.290	72 Lbs/M	Solid - 2 Twisted	Yes - Black Jacket
J20E404 +	20	0.350	94 Lbs/M	Solid - 4 Twisted	Yes - Black Jacket
J20E408 +	20	0.440	140 Lbs/M	Solid - 8 Twisted	Yes - Black Jacket
J20E4012 +	20	0.535	188 Lbs/M	Solid - 12 Twisted	Yes - Black Jacket
J20E4016 +	20	0.610	240 Lbs/M	Solid - 16 Twisted	Yes - Black Jacket
J20E4020 +	20	0.650	292 Lbs/M	Solid - 20 Twisted	Yes - Black Jacket
J20E4024 +	20	0.710	344 Lbs/M	Solid - 24 Twisted	Yes - Black Jacket
J20E4102 +	20	0.305	77 Lbs/M	Solid - 2 Twisted/Shielded	Yes - Black Jacket
J20E4104 +	20	0.385	104 Lbs/M	Solid - 4 Twisted/Shielded	Yes - Black Jacket
J20E4108 +	20	0.490	160 Lbs/M	Solid - 8 Twisted/Shielded	Yes - Black Jacket
J20E4112 +	20	0.610	218 Lbs/M	Solid - 12 Twisted/Shielded	Yes - Black Jacket
J20E4116 +	20	0.640	280 Lbs/M	Solid - 16 Twisted/Shielded	Yes - Black Jacket
J20E4120 +	20	0.710	342 Lbs/M	Solid - 20 Twisted/Shielded	Yes - Black Jacket
J20E4124 +	20	0.805	404 Lbs/M	Solid - 24 Twisted/Shielded	Yes - Black Jacket

+Available In Special Tolerance.

## Standard Construction - Multipair Cable

PART NUMBER	B & S WIRE GAUGE	APPROXIMATE DIAMETER	LBS. PER 1000 FT.	CONDUCTOR DESCRIPTION AND NUMBER OF PAIRS	ANSI COLOR CODES
K20E402 +	20	0.290	72 Lbs/M	Solid - 2 Twisted	Yes - Yellow Jacket
K20E404 +	20	0.350	94 Lbs/M	Solid - 4 Twisted	Yes - Yellow Jacket
K20E408 +	20	0.440	140 Lbs/M	Solid - 8 Twisted	Yes - Yellow Jacket
K20E4012 +	20	0.535	188 Lbs/M	Solid - 12 Twisted	Yes - Yellow Jacket
K20E4016 +	20	0.610	240 Lbs/M	Solid - 16 Twisted	Yes - Yellow Jacket
K20E4020 +	20	0.650	292 Lbs/M	Solid - 20 Twisted	Yes - Yellow Jacket
K20E4024 +	20	0.710	344 Lbs/M	Solid - 24 Twisted	Yes - Yellow Jacket
K20E412 +	20	0.305	77 Lbs/M	Solid - 2 Twisted/Shielded	Yes - Yellow Jacket
K20E414 +	20	0.385	104 Lbs/M	Solid - 4 Twisted/Shielded	Yes - Yellow Jacket
K20E418 +	20	0.490	160 Lbs/M	Solid - 8 Twisted/Shielded	Yes - Yellow Jacket
K20E4112 +	20	0.610	218 Lbs/M	Solid - 12 Twisted/Shielded	Yes - Yellow Jacket
K20E4116 +	20	0.640	280 Lbs/M	Solid - 16 Twisted/Shielded	Yes - Yellow Jacket
K20E4120 +	20	0.710	342 Lbs/M	Solid - 20 Twisted/Shielded	Yes - Yellow Jacket
K20E4124 +	20	0.805	404 Lbs/M	Solid - 24 Twisted/Shielded	Yes - Yellow Jacket
T20E404	20	0.350	82 Lbs/M	Solid - 4 Twisted	Yes - Blue Jacket
T20E408	20	0.440	140 Lbs/M	Solid - 8 Twisted	Yes - Blue Jacket
T20E4012	20	0.535	188 Lbs/M	Solid - 12 Twisted	Yes - Blue Jacket
T20E4024	20	0.710	344 Lbs/M	Solid - 24 Twisted	Yes - Blue Jacket
T20E414	20	0.385	104 Lbs/M	Solid - 4 Twisted/Shielded	Yes - Blue Jacket
T20E418	20	0.490	160 Lbs/M	Solid - 8 Twisted/Shielded	Yes - Blue Jacket
T20E4112	20	0.610	218 Lbs/M	Solid - 12 Twisted/Shielded	Yes - Blue Jacket
T20E4124	20	0.805	404 Lbs/M	Solid - 24 Twisted/Shielded	Yes - Blue Jacket

## RTD Wire Construction Characteristics

CODE	SINGLE CONDUCTOR		DUPLEX CONDUCTOR		TEMPERATURE RATING		NO. OF WIRES	PHYSICAL CHARACTERISTICS			NOTES
	INSULATION	IMPREGNATION	INSULATION	IMPREGNATION	CONTINUOUS	SINGLE READING		ABRASION RESISTANCE	MOISTURE RESISTANCE	CHEMICAL RESISTANCE	
60	TFE	None	TFE	None	392 F	392 F	3, 4	Good	Excellent	Good	Shielded & Jacketed
61	Extruded FEP	None	Glass FEP. Extruded Braid	None	400 F	500 F	2, 3, 4	Excellent	Excellent	Excellent	
62	Glass Braid	Modified Resin	Glass Braid	Modified Resin	900 F	1000 F	2, 3, 4	Fair	Good	Good	Red Single Conductor
63	TFE	None	N/A		392 F	392 F	1	Good	Excellent	Excellent	White Single Conductor
64	TFE	None	N/A		392 F	392 F	1	Good	Excellent	Excellent	No Shield
65	TFE	None	TFE	None	392 F	392 F	3, 4	Good	Excellent	Excellent	White W/Red Tracer
66	Glass Braid	None	N/A	None	900 F	900 F	1	Fair	Good	Good	White
67	Glass Braid	None	N/A	None	900 F	900 F	1	Fair	Good	Good	

## RTD Wire

PART NUMBER	B & S WIRE GAUGE	APPROXIMATE DIAMETER	LBS. PER 1000 FT.	CONDUCTOR DESCRIPTION AND NUMBER OF CONDUCTORS
D24S612	24 (7/28)	0.024	12 Lbs/M	Stranded Silver Plated Copper - 2 Conductor
D22S612	22 (7/28)	0.030	14 Lbs/M	Stranded Silver Plated Copper - 2 Conductor
D20S612	20 (7/28)	0.038	17 Lbs/M	Stranded Silver Plated Copper - 2 Conductor
D24S613	24 (7/28)	0.024	16 Lbs/M	Stranded Silver Plated Copper - 3 Conductor
D22S613	22 (7/28)	0.030	20 Lbs/M	Stranded Silver Plated Copper - 3 Conductor
D22S613	20 (7/28)	0.038	17 Lbs/M	Stranded Silver Plated Copper - 3 Conductor
D24S614	24 (7/28)	0.024	19 Lbs/M	Stranded Silver Plated Copper - 4 Conductor
D22S614	22 (7/28)	0.030	23 Lbs/M	Stranded Silver Plated Copper - 4 Conductor
D20S614	20 (7/28)	0.038	27 Lbs/M	Stranded Silver Plated Copper - 4 Conductor
D24S603	24 (7/28)	0.024	20 Lbs/M	Stranded Silver Plated Copper - 3 Conductor
D24S622	24 (7/28)	0.024	6 Lbs/M	Stranded Silver Plated Copper - 2 Conductor
D22S622	22 (7/28)	0.030	7 Lbs/M	Stranded Silver Plated Copper - 2 Conductor
D20S622	20 (7/28)	0.038	9 Lbs/M	Stranded Silver Plated Copper - 2 Conductor
D24S623	20 (7/28)	0.024	8 Lbs/M	Stranded Silver Plated Copper - 3 Conductor
D20S623	20 (7/28)	0.038	12 Lbs/M	Stranded Silver Plated Copper - 3 Conductor
D24S631	24 (19/36)	0.024	4 Lbs/M	Stranded Silver Plated Copper - 1 Conductor
D24S641	24 (19/36)	0.024	4 Lbs/M	Stranded Silver Plated Copper - 1 Conductor

### RTD Wire Ordering Information:

