

# ANSI and IEC Color Codes for Thermocouples, Wire and Connectors

ANSI MC 96.1  
Color Coding



IEC 584-3  
Color Coding

ANSI Code	ANSI MC 96.1 Color Coding		+ Lead	Alloy Combination	- Lead	Comments Environment Bare Wire	Max T/C Temp Grade Range	EMF (mV) Over Max Temp Range	IEC Code	IEC 584-3 Color Coding	
	Thermocouple Grade	Extension Grade								Thermocouple Grade	Intrinsically Safe
<b>J</b>				IRON, Fe (magnetic)	CONSTANTAN COPPER-NICKEL Cu-Ni	Reducing, Vacuum, Inert. Limited Use in Oxidizing at High Temperatures. Not Recommended for Low Temperatures.	- 210 to 1200 °C - 346 to 2193 °F	- 8.095 to 69.553	<b>J</b>		
<b>K</b>				CHROMEAL® NICKEL-CHROMIUM Ni-Cr	ALOMEGA® NICKEL-ALUMINUM Ni-Al (magnetic)	Clean Oxidizing and Inert. Limited Use in Vacuum or Reducing. Wide Temperature Range, Most Popular Calibration.	- 270 to 1372 °C - 454 to 2501 °F	- 6.458 to 54.886	<b>K</b>		
<b>T</b>				COPPER Cu	CONSTANTAN COPPER-NICKEL Cu-Ni	Mild Oxidizing, Reducing Vacuum or Inert. Good Where Moisture Is Present. Low Temperature & Cryogenic Applications.	- 270 to 400 °C - 454 to 752 °F	- 6.258 to 20.872	<b>T</b>		
<b>E</b>				CHROMEAL® NICKEL-CHROMIUM Ni-Cr	CONSTANTAN COPPER-NICKEL Cu-Ni	Oxidizing or Inert. Limited Use in Vacuum or Reducing. Highest EMF Change Per Degree.	- 270 to 1000 °C - 454 to 1832 °F	- 9.835 to 76.373	<b>E</b>		
<b>N</b>				OMEGA-P® NICROSIL Ni-Cr-Si	OMEGA-N® NISIL Ni-Si-Mg	Alternative to Type K. More Stable at High Temperatures.	- 270 to 1300 °C - 450 to 2372 °F	- 4.345 to 47.513	<b>N</b>		
<b>R</b>	NONE			PLATINUM-13 % RHODIUM Pt-13 % Rh	PLATINUM Pt	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of Contamination. High Temperature.	- 50 to 1768 °C - 58 to 3214 °F	- 0.226 to 21.101	<b>R</b>		
<b>S</b>	NONE			PLATINUM-10 % RHODIUM Pt-10 % Rh	PLATINUM Pt	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of Contamination. High Temperature.	- 50 to 1768 °C - 58 to 3214 °F	- 0.236 to 18.693	<b>S</b>		
<b>U</b>	NONE			COPPER Cu	COPPER-LOW NICKEL Cu-Ni	Extension Grade Connecting Wire for R & S Thermocouples, also Known as RX & SX Extension Wire.			<b>U</b>		
<b>B</b>	NONE			PLATINUM-30 % RHODIUM Pt-30 % Rh	PLATINUM-6 % RHODIUM Pt-6 % Rh	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of Contamination. High Temperature. Common Use in Glass Industry.	0 to 1820 °C 32 to 3308 °F	0 to 13.820	<b>B</b>		
<b>G*<sub>(W)</sub></b>	NONE			TUNGSTEN W	TUNGSTEN-26 % RHENIUM W-26 % Re	Vacuum, Inert, Hydrogen. Beware of Embrittlement. Not Practical Below 399 °C (750 °F). Not for Oxidizing Atmosphere.	0 to 2320 °C 32 to 4208 °F	0 to 38.564	<b>G<sub>(W)</sub></b>	NO STANDARD USE ANSI COLOR CODE	
<b>C*<sub>(W5)</sub></b>	NONE			TUNGSTEN-5 % RHENIUM W-5 % Re	TUNGSTEN-26 % RHENIUM W-26 % Re	Vacuum, Inert, Hydrogen. Beware of Embrittlement. Not Practical Below 399 °C (750 °F) Not for Oxidizing Atmosphere.	0 to 2320 °C 32 to 4208 °F	0 to 37.066	<b>C<sub>(W5)</sub></b>	NO STANDARD USE ANSI COLOR CODE	
<b>D*<sub>(W3)</sub></b>	NONE			TUNGSTEN-3 % RHENIUM W-3 % Re	TUNGSTEN-25 % RHENIUM W-25 % Re	Vacuum, Inert, Hydrogen. Beware of Embrittlement. Not Practical Below 399 °C (750 °F) - Not for Oxidizing Atmosphere.	0 to 2320 °C 32 to 4208 °F	0 to 39.506	<b>D<sub>(W3)</sub></b>	NO STANDARD USE ANSI COLOR CODE	

\* Not official symbol or standard designation

# Thermocouples Tolerances (reference Junction at 0° C)

American Limits of Error ASTM E230-ANSI MC 96.1

ANSI Code		Standard Limits <sup>†</sup>		Special Limits <sup>†</sup>	
J	Temp Range Tolerance Value	> 0 to 750 °C 2.2 °C or 0.75 %	> 32 to 1382 °F 4.0 °F or 0.75 %	0 to 750 °C 1.1 °C or 0.4 %	32 to 1382 °F 2.0 °F or 0.4 %
K	Temp Range Tolerance Value Temp Range* Tolerance Value	> 0 to 1250 °C 2.2 °C or 0.75 % -200 to 0 °C 2.2 °C or 2.0 %	> 32 to 2282 °F 4.0 °F or 0.75 % -328 to 32 °C 4.0 °C or 2.0 %	0 to 1250 °C 1.1 °C or 0.4 %	32 to 2282 °F 2.0 °F or 0.4 %
T	Temp Range Tolerance Value Temp Range* Tolerance Value	>0 to 350°C 1.0°C or 0.75% -200 to 0°C 1.0°C or 1.5%	> 32 to 662 °F 1.8 °F or 0.75 % -328 to 32 °C 1.8 °C or 1.5 %	0 to 350 °C 0.5 °C or 0.4 %	32 to 662 °F 1 °F or 0.4 %
E	Temp Range Tolerance Value Temp Range* Tolerance Value	> 0 to 900 °C 1.7 °C or 0.5 % -200 to 0 °C 1.7 °C or 1.0 %	> 32 to 1652 °F 3 °F or 0.5 % -328 to 32 °C 3 °C or 1.0 %	0 to 900 °C 1.0 °C or 0.4 %	32 to 1652 °F 1.8 °F or 0.4 %
N	Temp Range Tolerance Value Temp Range* Tolerance Value	>0 to 1300 °C 2.2 °C or 0.75 % -270 to 0 °C 2.2 °C or 2.0 %	> 32 to 2372 °F 4.0 °F or 0.75 % -454 to 32 °C 4.0 °C or 2.0 %	0 to 1300 °C 1.1 °C or 0.4 %	32 to 2372 °F 2.0 °F or 0.4 %
R S	Temp Range Tolerance Value	0 to 1450 °C 1.5 °C or 0.25 %	32 to 2642 °F 2.7 °F or 0.25 %	0 to 1450 °C 0.6 °C or 0.1 %	32 to 2642 °F 1 °F or 0.1 %
B	Temp Range Tolerance Value	800 to 1700 °C 0.5 %	1472 to 3092 °F 0.9 °F	Not established	
G* C* D*	Temp Range Tolerance Value	0 to 2320 °C 4.5 °C or 1.0 %	32 to 4208 °F 0.9 °F	Not established	

\* Not official symbol or standard designation      † Whichever value is greater.

**Note:** Material is normally selected to meet tolerances above 0 °C. If thermocouples are needed to meet tolerances below 0 °C, the purchaser shall state this as selection of material is usually required.

# IEC Tolerance Class EN 60584-2; JIS C 1602

IEC Code		Class 1	Class 2	Class 3 <sup>†</sup>
J	Temp Range Tolerance Value Temp Range Tolerance Value	-40 to 375 °C ± 1.5 °C 375 to 750 °C ± 0.4 % Reading	-40 to 333 °C ± 2.5 °C 333 to 750 °C ± 0.75 % Reading	Not established
K N	Temp Range Tolerance Value Temp Range Tolerance Value	-40 to 375 °C ± 1.5 °C 375 to 1000 °C ± 0.4 %	-40 to 333 °C ± 2.5 °C 333 to 1200 °C ± 0.75 % Reading	-167 to 40 °C ± 2.5 °C -200 to -167 °C ± 1.5 % Reading
T	Temp Range Tolerance Value Temp Range Tolerance Value	-40 to 125 °C ± 0.5 °C 125 to 350 °C ± 0.4 % Reading	-40 to 133 °C ± 1 °C 133 to 350 °C ± 0.75 % Reading	-67 to 40 °C ± 1 °C -200 to -67 °C ± 1.5 % Reading
E	Temp Range Tolerance Value Temp Range Tolerance Value	-40 to 375 °C ± 1.5 °C 375 to 800 °C ± 0.4 % Reading	-40 to 333 °C ± 2.5 °C 333 to 900 °C ± 0.75 % Reading	-167 to 40 °C ± 2.5 °C -200 to -167 °C ± 1.5 % Reading
R S	Temp Range Tolerance Value Temp Range Tolerance Value	0 to 1100 °C ± 1 °C 1100 to 1600 °C ± [1 + 0.3 % x (Rdg -1100)] °C	0 to 600 °C ± 1.5 °C 600 to 1600 °C ± 0.25 % Reading	Not established
B	Temp Range Tolerance Value Temp Range Tolerance Value	Not established	600 to 1700 °C ± 0.25 % Reading	600 to 800 °C + 4 °C 800 to 1700 °C ± 0.5 % Reading

<sup>†</sup> Material is normally selected to meet tolerances above -40 °C. If thermocouples are needed to meet limits of Class 3, as well as those of Class 1 or 2, the purchaser shall state this, as selection of material is usually required.

# Wire Insulation Identification and Application Guide

Insulation Code	Insulation		Appearance of TC Grade Wire	Temp Range, Insulation	Abrasion Resistance	Flexibility	Water Submersion	Resistance to					Comments
	Overall	Conductors						Solvent	Acid	Base	Flame	Humidity	
<b>PP</b> (Extension Grade EXPP)	Polyvinyl Chloride (PVC)	Polyvinyl Chloride (PVC)		-40 to 105 °C -40 to 221 °F	Good	Excellent	Good	Fair	Good	Good	Good	Good	Color Coded PVC Extruded Over Each Bare Wire. PVC Applied Over Insulated Primaries. Affected by Ketones, Esters
<b>FF</b> (Extension Grade EXFF)	FEP or Neoflon	FEP or Neoflon		-200 to 200 °C -338 to 392 °F	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Color Coded PVC Extruded Over Each Bare Wire. PVC Applied Over Insulated Primaries. Affected by Ketones, Esters
<b>TT</b> (Extension Grade EXTT)	PFA or Neoflon	PFA or Neoflon		-267 to 260 °C -450 to 500 °F	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Color Coded PFA Extruded Over Each Bare Wire. PFA Jacket Extruded Over Insulated Primaries. Superior Abrasion and Moisture Resistance. Same Basic Characteristics as FEP but Higher Temperature Rating
<b>KK</b>	Kapton	Kapton		-267 to 316 °C -450 to 600 °F	Excellent	Good	Good	Good	Good	Good	Good	Excellent	Fused Kapton Tape Approx. 0.15 mm Applied to Conductors. A 0.10 mm Jacket Is Then Applied to Both. Excellent Moisture and Abrasion Resistance, High Dielectric Strength (7 kV/mil) Retains Much Physical Integrity After Gamma Radiation. FEP Is Used as Adhesive Binding Agent (Melts at approx 260 °C [500 °F])
<b>TG</b>	Glass Braid	PFA or Neoflon		-73 to 260 °C -100 to 500 °F	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	PFA Extruded Over Each Bare Wire and a Glass Braid on the Jacket. May Be Used for Single Measurement to 343 °C (650 °F)
<b>GG</b> (Extension Grade EXGG)	Glass Braid	Glass Braid		-73 to 482 °C -100 to 900 °F	Poor	Good	Poor	Excellent	Excellent	Excellent	Excellent	Fair	0.12 mm Glass Braid Over Each Conductor, and Binder Impregnated. Overall Glass Braid Applied and Binded. Binder Improves Moisture and Abrasion Resistance but Is Destroyed Above 204 °C (400 °F)
<b>HH</b>	High Temp Glass Braid	High Temp Glass Braid		-73 to 871 °C -100 to 1300 °F	Poor	Good	Poor	Excellent	Excellent	Excellent	Excellent	Fair	High Temp. Glass Braid Over Each Conductor, and Binder Impregnated. Overall High Temp Glass Braid Applied and Binded. Binder Improves Moisture and Abrasion Resistance but Is Destroyed Above 400 °F
<b>XR</b>	Refrasil Braid	Refrasil Braid		-73 to 871 °C -100 to 1600 °F	Poor	Good to 315 °C (600 °F)	Poor to 315 °C (600 °F)	Excellent	Good to 315 °C (600 °F)	Good to 315 °C (600 °F)	Excellent	Poor	Braid of Vitreous Silica Fiber Applied to Each Bare Wire, Then Over Both. Suitable to 982 °C (1800 °F) if Not Subjected to Flexure or Abrasion
<b>XC</b> Standard braid XL-Loose braid XT0Tight braid	Nextel Braid	Nextel Braid		-73 to 1204 °C -100 to 2200 °F	Poor	Good	Poor	Excellent	Good	Good	Excellent	Fair	High Temp, Alumina-Boria-Silica Ceramic Fiber Braided Over Each Conductor Then Over Both. Not Recommended for Platinum Thermocouples or Exposure to Molten Tin and Copper, Hydrofluoric or Phosphoric Acids, or Strong Alkalies
<b>XS</b>	Silica	Silica		-73 to 1038 °C -100 to 1990 °F	Poor	Good	Poor	Excellent	Good	Poor	Excellent	Fair	Silica Is a Very High Purity, Chemically Stable Yarn. (SiO2 Content 99 %)
<b>TFE</b>	TFE	TFE		-267 to 260 °C -450 to 500 °F	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Color Coded TFE Tape Applied to Conductors and Jacket. Superior Abrasion, Moisture, and Chemical Resistance

# Reference Guide

## Properties of the sheath material diameter and construction of thermocouple assembly

### Temperature Range

OMEGACLAD® is a three-part system composed of compacted MgO insulation, thermocouple wire and metal sheath. Four factors determine the useful service temperature for OMEGACLAD® assemblies.

- Range for the thermocouple wire (see table of error)
- Maximum service temperature of insulation. In the case of MgO, this is in excess of 1650 °C (3000 °F)

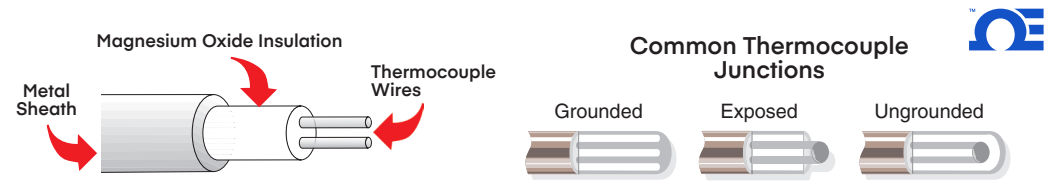
### Sheath Material Specifications

Material	Melting Point (°C/°F)	Continuous Max Temp (°C/°F)	Tensile (PSI) Strength	
			@ 93 °C (200 °F)	@ 537 °C (1000 °F)
304 SS	1405/2560	900/1650	68,000	15,000
310 SS	1405/2560	1150/2100	75,000	27,500
316 SS	1370/2500	925/1700	75,000	23,000
321 SS	1400/2550	870/1600	70,000	17,000
Hastelloy X	1260/2300	1200/2200	55,100	35,500
Inconel*	1400/2550	1150/2100	39,000	5,000
SUPER XL	1400/2550	1204/2200	70,000	17,000

\* Oxidizing, Vacuum or Inert atmosphere only.

### Upper Temperature Limit in °C (°F) of Protected Bare Wire Thermocouples vs. Wire Diameter

T/C Type	Wire Size						
	8 AWG 0.128 "	14 AWG 0.064 "	20 AWG 0.032 "	24 AWG 0.020 "	28 AWG 0.013 "	30 AWG 0.010 "	36 AWG 0.005 "
<b>J</b>	760 (1400)	590 (1100)	480 (900)	370 (700)	370 (700)	320 (600)	315 (590)
<b>K</b>	1260 (2300)	1090 (2000)	980 (1800)	870 (1600)	870 (1600)	760 (1400)	590 (1100)
<b>E</b>	870 (1600)	650 (1200)	540 (1000)	430 (800)	430 (800)	370 (700)	320 (600)
<b>T</b>	370 (700)	370 (700)	260 (500)	200 (400)	200 (400)	150 (300)	
<b>RX/SX</b>	200 (400)	200 (400)	200 (400)	200 (400)	200 (400)	150 (300)	
<b>N</b>	1260 (2300)	1090 (2000)	980 (1800)	980 (1800)	980 (1800)	870 (1600)	
<b>CX</b>	472 (800)	472 (800)	472 (800)	472 (800)	472 (800)	400 (752)	



### Conductor Size Equivalents

Gage No.	AWG		SWG		Gage No.	AWG		SWG	
	inches	mm	inches	mm		inches	mm	inches	mm
0	0.3249	8.25	0.324	8.23	23	0.0226	0.574	0.024	0.610
1	0.2893	7.35	0.300	7.62	24	0.0201	0.511	0.022	0.559
2	0.2576	6.54	0.276	7.01	25	0.0179	0.455	0.020	0.508
3	0.2294	5.83	0.252	6.40	26	0.0159	0.404	0.0180	0.457
4	0.2043	5.19	0.232	5.89	27	0.0142	0.361	0.0164	0.417
5	0.1819	4.62	0.212	5.38	28	0.0126	0.320	0.0148	0.376
6	0.1620	4.11	0.192	4.88	29	0.0113	0.287	0.0136	0.345
7	0.1443	3.67	0.176	4.47	30	0.0100	0.254	0.0124	0.315
8	0.1285	3.26	0.160	4.06	31	0.0089	0.226	0.0116	0.295
9	0.1144	2.91	0.144	3.66	32	0.0080	0.203	0.0108	0.274
10	0.1019	2.59	0.128	3.25	33	0.0071	0.180	0.0100	0.254
11	0.0907	2.30	0.116	2.95	34	0.0063	0.160	0.0092	0.234
12	0.0808	2.05	0.104	2.64	35	0.0056	0.142	0.0084	0.213
13	0.0720	1.83	0.092	2.34	36	0.0050	0.127	0.0076	0.193
14	0.0641	1.63	0.080	2.03	37	0.0045	0.114	0.0068	0.173
15	0.0571	1.45	0.072	1.83	38	0.0040	0.102	0.0060	0.152
16	0.0508	1.29	0.064	1.42	39	0.0035	0.089	0.0052	0.132
17	0.0453	1.15	0.056	1.42	40	0.0031	0.079	0.0048	0.122
18	0.0403	1.02	0.048	1.22	41	0.0028	0.071	0.0044	0.112
19	0.0359	0.912	0.040	1.02	42	0.0025	0.064	0.0040	0.102
20	0.0320	0.813	0.036	0.914	43	0.0022	0.056	0.0036	0.091
21	0.0285	0.724	0.032	0.813	44	0.0020	0.051	0.0032	0.081
22	0.0253	0.643	0.028	0.711	45	0.0018	0.046	0.0028	0.071

AWG = American Wire Gage. To convert from AWG to SWG: Determine wire diameter in inches (mm) from appropriate AWG.  
SWG = (British) Standard Wire Gage. To convert 30 AWG to SWG, determine that 30 AWG is 0.0100", which is equivalent to 33 SWG.

### Upper Temperature Limit in °C (°F) of OMEGACLAD® vs. Sheath Diameter

Sheath T/C Dia.	0.020 " 0.5 mm	0.032 " 0.8 mm	0.040 " 1.0 mm	0.062 " 1.6 mm	0.093 " 2.4 mm	0.125 " 3.2 mm	0.188 " 4.8 mm	0.250 " 6.3 mm
<b>J</b>	260 (500)	260 (500)	260 (500)	440 (825)	480 (900)	520 (970)	620 (1150)	720 (1300)
<b>K &amp; N</b>	700 (1290)	700 (1290)	700 (1290)	920 (1690)	1000 (1830)	1070 (1960)	1150 (2100)	1150 (2100)
<b>E</b>	300 (570)	300 (570)	300 (570)	510 (950)	580 (1075)	650 (1200)	730 (1350)	820 (1510)
<b>T</b>	260 (500)	260 (500)	260 (500)	260 (500)	260 (500)	315 (600)	370 (700)	370 (700)

# Properties of PFA and FEP Insulation

## General Properties of Neoflon, FEP and PFA

The combination of chemical and physical properties of FEP, PFA and Neoflon is a result of its true fluorocarbon structure. This unusual structure leads to a material which has an almost universal chemical inertness; complete insolubility in all known solvents below 300 °C (572 °F); excellent thermal stability; and unsurpassed electrical properties including low dielectric loss, low dielectric constant and high dielectric strength. Furthermore, FEP, PFA and Neoflon does not embrittle at very low temperatures.

	Neoflon FEP	Neoflon PFA
Chemical Resistance: hydrocarbons, ethylene glycol, battery acid, brake fluid, other chemicals	NO EFFECT	NO EFFECT
Resistance to weathering	NO EFFECT	NO EFFECT
Water absorption (ASTM D570)	0.1 %	0.1 %
Flammability (UL 83, Vertical Wire Flame Test)*	NO AFTER BURN	NO AFTER BURN
Melting Point °F	518 °F	590 °F
Melting Point °C	270 °C	300 °C
Upper Service Temperature °C (°F) 1500 to 2000 hrs. estimated 20,000 hrs. Cold bend @ -65 °C 2.5 K V for 5 min.	200 °C (392 °F) 177 °C (350 °F) PASS	288 °C (550 °F) 260 °C (500 °F) PASS
Specific gravity	2.15	2.15

\* Increase the resistance by 19 % for nickel plated, Type RTD wire.

## Mechanical and Electrical Properties

	Neoflon FEP	Neoflon PFA
Tensile strength, psi 23 °C (73 °F) ASTM D638	3,000	4,000
Elongation, % 23 °C (73 °F) ASTM D638	300	400
Flexural modulus, psi 23 °C (73 °F) ASTM D790	95,000	95,000
Flex life, MIT (7 to 9 mils) 82 °C (180 °F) Flexes	100,000	200,000
Impact Strength, ft.lb/in.: ASTM D256 Room temperature -54 °C (-65 °F)	NO BREAK 10	NO BREAK 10
Coefficient of friction, 10 fpm, 100 psi	0.3	0.2
Dynamic cut-through (lb) Instron 1/16 " radius blade moving at 0.2 "/min. (0.0031 " insulation thickness) 23 °C 75 °F	118 73	
Dielectric constant, ASTM D50	2.1	2.1
Volume resistivity, ohm-cm ASTM D257	10 <sup>18</sup>	10 <sup>18</sup>
Dissipation Factor, ASTM D150.10 <sup>2</sup> - 10 <sup>6</sup> Hz	0.001	0.0004

# Resistance vs. Wire Diameter

Resistance in ohms per double foot @ 20 °C (68 °F)

AWG No.	Dia.		Type K <sup>††</sup> CHROME <sup>®</sup> GA <sup>®</sup> / ALOMEGA <sup>®</sup>	Type J Iron/ Constantan	Type T Copper/ Constantan	Type E CHROME <sup>®</sup> GA <sup>®</sup> / Constantan	Type S Pt/ Pt13 % Rh	Type R Pt/ Pt13 % Rh	Type RX/SX Copper Alloy 11*	Type C <sup>†</sup> W5 % Re/ W26 % Re	Type CX Alloy 405/ Alloy 426	Type G <sup>†</sup> W/ W26% Re	Type D <sup>†</sup> W3 % Re/ W25% Re	Type BX Copper/ Copper*
	Inch	mm												
6	0.162	4.11	0.023	0.014	0.012	0.027	0.007	0.007	0.003	0.009	0.014	0.008	0.009	0.000790
8	0.128	3.25	0.037	0.022	0.019	0.044	0.011	0.011	0.004	0.015	0.023	0.012	0.015	0.001998
10	0.102	2.59	0.058	0.034	0.029	0.069	0.018	0.018	0.007	0.023	0.037	0.020	0.022	0.001998
12	0.081	2.06	0.091	0.054	0.046	0.109	0.028	0.029	0.011	0.037	0.058	0.031	0.035	0.00318
14	0.064	1.63	0.146	0.087	0.074	0.175	0.045	0.047	0.018	0.058	0.093	0.049	0.055	0.00505
16	0.051	1.30	0.230	0.137	0.117	0.276	0.071	0.073	0.028	0.092	0.146	0.078	0.088	0.00803
18	0.040	1.02	0.374	0.222	0.190	0.448	0.116	0.119	0.045	0.148	0.238	0.126	0.138	0.01277
20	0.032	0.81	0.586	0.357	0.298	0.707	0.185	0.190	0.071	0.235	0.371	0.200	0.220	0.02030
24	0.0201	0.51	1.490	0.878	0.7526	1.78	0.464	0.478	0.180	0.594	0.941	0.560	0.560	0.05134
26	0.0159	0.40	2.381	1.405	1.204	2.836	0.740	0.760	0.288	0.945	1.503	0.803	0.890	0.08162
30	0.0100	0.25	5.984	3.551	3.043	7.169	1.85	1.91	0.727	2.38	3.800	2.03	2.26	0.2064
32	0.0080	0.20	9.524	5.599	4.758	11.31	1.96	3.04	1.136	3.8	5.94	3.22	3.60	0.3282
34	0.0063	0.16	15.17	8.946	7.66	18.09	4.66	4.82	1.832	6.04	9.57	5.10	5.70	0.5218
36	0.0050	0.13	24.08	14.20	12.17	28.76	7.40	7.64	2.908	9.6	15.20	8.16	9.10	0.8296
38	0.0039	0.10	38.20	23.35	19.99	45.41	11.6	11.65	4.780	15.3	24.98	12.9	15.3	1.3192
40	0.00315	0.08	60.88	37.01	31.64	73.57	18.6	19.3	7.327	24.4	38.30	20.6	23.0	2.098
44	0.0020	0.051	149.6	88.78	76.09	179.20	74.0	76.5	18.18	60.2	95.00	51.1	56.9	5.134
50	0.0010	0.025	598.4	355.1	304.3	716.9	185	191	72.7	240	380.0	204	227	20.64
56	0.00049	0.012	2408	1420	1217	2816	740	764	302.8	1000	1583	850	945	86.38

\*Maximum Resistance of reviewed wire. †Not ANSI symbol. ††Resistivity for N is 1.324 times Type K values.

## How to Specify Wire, Connectors and Probes with ANSI or IEC Color Codes

### Thermocouple Wire

To order IEC color coded wire, add the suffix "I" after the thermocouple type letter.

**Examples: TT-K-20-50M** : PFA over PFA Insulation, Type K, ANSI color code, 20 gage wire, 50 meters long

**TT-KI-20-50M** : PFA over PFA Insulation, Type K, **IEC** color code, 20 gage wire, 50 meters long

### Connectors

To order IEC color coded connectors, add the suffix "I" after the thermocouple calibration letter.

**Examples: OSTW-K-MF** : OST write-on connector, Type K, ANSI color code, male/female\* pair

**OSTW-KI-MF** : OST write-on connector, Type K, **IEC** color code, male/female\* pair

\* Supplied with the exclusive universal write-on female connector.

### OMEGA<sup>®</sup>CLAD<sup>®</sup> Probes

To order IEC color coded OMEGA<sup>®</sup>CLAD<sup>®</sup> probes, add the suffix "I" before the "M" in the model number\*

**Examples: KQIN-M30G-300** : Type J, Inconel sheath, 3 mm diameter ANSI color code, 300 mm length

**KQIN-IM30G-300** : Type J, Inconel sheath, 3 mm diameter, **IEC** color code, 300 mm length

### Insulated Wire T/Cs

To order IEC color coded wire, add the suffix "I" after the thermocouple calibration letter.

**Examples: 5TC-GG-K-20-1M** : Glass over glass insulated thermocouples, Type K, ANSI color code, 20 gage wire, 1 meter (1000 mm) long

**5TC-GG-KI-20-1M** : Glass over glass insulated thermocouples, Type K, **IEC** color code, 20 gage wire, 1 meter (1000 mm) long