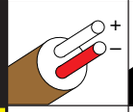
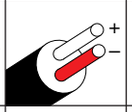
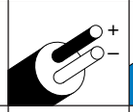
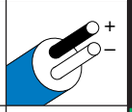
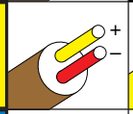
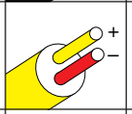
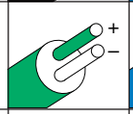
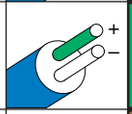
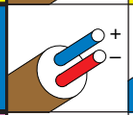
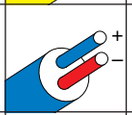
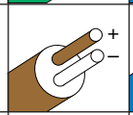
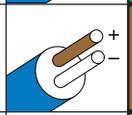
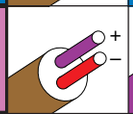
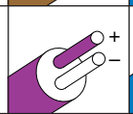
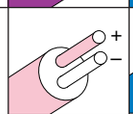
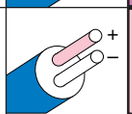
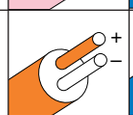
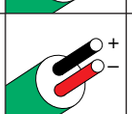
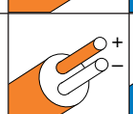
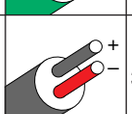
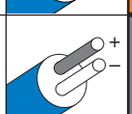
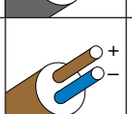
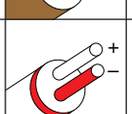
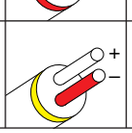
ANSI and IEC Color Codes†
for Thermocouples, Wire and Connectors

All OMEGA® Thermocouple Wire, Probes and Connectors are available with either ANSI or IEC Color Codes. In this Handbook, model numbers in the To Order tables reflect the ANSI Color-Coded Product. Please see the next pages for instructions on how to order IEC Color-Coded products.

ANSI Code	ANSI MC 96.1 Color Coding: Thermocouple Grade	ANSI MC 96.1 Color Coding: Extension Grade	Alloy Combination: + Lead	Alloy Combination: – Lead	Comments Environment Bare Wire	Maximum T/C Grade Temp. Range	EMF (mV) Over Max. Temp. Range	IEC 584-3 Color Coding: Thermocouple Grade	IEC 584-3 Color Coding: Intrinsically Safe	IEC Code
J			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			J
K			CHROMEGA® 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			K
T			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			T
E			CHROMEGA® 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			E
N			OMEGA-P® NICROSIL Ni-Cr-Si	OMEGA-N® NISIL Ni-Si-Mg	Alternative to Type K. More Stable at High Temps	–270 to 1300°C –450 to 2372°F	–4.345 to 47.513			N
R	NONE ESTABLISHED		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			R
S	NONE ESTABLISHED		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			S
U	NONE ESTABLISHED		COPPER Cu	COPPER-LOW NICKEL Cu-Ni	Extension Grade Connecting Wire for R & S Thermocouples, Also Known as RX & SX Extension Wire.					U
B	NONE ESTABLISHED		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 Temp. Common Use in Glass Industry	0 to 1820°C 32 to 3308°F	0 to 13.820			B
G* (W)	NONE ESTABLISHED		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	NO STANDARD USE ANSI COLOR CODE		G (W)
C* (W5)	NONE ESTABLISHED		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	NO STANDARD USE ANSI COLOR CODE		C (W5)
D* (W3)	NONE ESTABLISHED		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	NO STANDARD USE ANSI COLOR CODE		D (W3)

** Not official symbol or standard designation*

† JIS color code also available.

Thermocouple Tolerances
(Reference Junction at 0°C)

American Limits of Error ASTM E230-ANSI MC 96.1

ANSI Code		Standard Limits†		Special Limits†	
J	Temp Range	>0 to 750°C	>32 to 1382°F	0 to 750°C	32 to 1382°F
	Tolerance Value	2.2°C or 0.75%	4.0°F or 0.75%	1.1°C or 0.4%	2.0°F or 0.4%
K	Temp Range	>0 to 1250°C	>32 to 2282°F	0 to 1250°C	32 to 2282°F
	Tolerance Value	2.2°C or 0.75%	4.0°F or 0.75%	1.1°C or 0.4%	2.0°F or 0.4%
	Temp. Range*	-200 to 0°C	-328 to 32°F		
	Tolerance Value	2.2°C or 2.0%	4.0°F or 2.0%		
T	Temp Range	>0 to 350°C	>32 to 662°F	0 to 350°C	32 to 662°F
	Tolerance Value	1.0°C or 0.75%	1.8°F or 0.75%	0.5°C or 0.4%	1°F or 0.4%
	Temp. Range*	-200 to 0°C	-328 to 32°F		
	Tolerance Value	1.0°C or 1.5%	1.8°F or 1.5%		
E	Temp Range	>0 to 900°C	>32 to 1652	0 to 900°C	32 to 1652°F
	Tolerance Value	1.7°C or 0.5%	3°F or 0.5%	1.0°C or 0.4%	1.8°F or 0.4%
	Temp. Range*	-200 to 0°C	-328 to 32°F		
	Tolerance Value	1.7°C or 1.0%	3°F or 1.0%		
N	Temp Range	>0 to 1300°C	>32 to 2372°F	0 to 1300°C	32 to 2372°F
	Tolerance Value	2.2°C or 0.75%	4.0°F or 0.75%	1.1°C or 0.4%	2.0°F or 0.4%
	Temp. Range*	-270 to 0°C	-454 to 32°F		
	Tolerance Value	2.2°C or 2.0%	4.0°F or 2.0%		
R S	Temp Range	0 to 1450°C	32 to 2642°F	0 to 1450°C	32 to 2642°F
	Tolerance Value	1.5°C or 0.25%	2.7°F or 0.25%	0.6°C or 0.1%	1°F or 0.1%
B	Temp Range	800 to 1700°C	1472 to 3092°F	Not Established	
	Tolerance Value	0.5%	0.5%		
G*C*D*	Temp Range	0 to 2320°C	32 to 4208°F	Not Established	
	Tolerance Value	4.5°C or 1.0%	9°F or 1.0%		

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

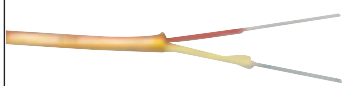
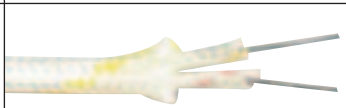
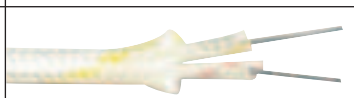
Note: *Material is normally selected to meet tolerances above 0°C. If thermocouples are needed to meet tolerances below 0°C, the purchaser shall state this as selection of material is usually required.*

IEC Tolerance Class EN 60584-2; JIS C 1602

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

†† 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.

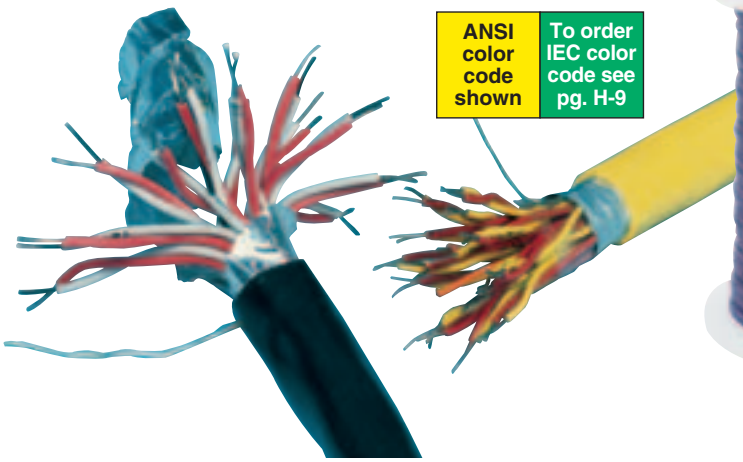
Wire Insulation Identification

Insulation Code	Insulation		Appearance of Thermocouple Grade Wire	Temperature Range, Insulation	Abrasion Resistance	Flexibility	Water Submersion
	Overall	Conductors					
PP (Extension Grade-EXPP)	Polyvinyl Chloride (PVC)	Polyvinyl Chloride (PVC)		-40 to 105°C -40 to 221°F	Good	Excellent	Good
FF (Extension Grade-EXFF)	FEP Teflon® or Neoflon	FEP Teflon® or Neoflon		-200 to 200°C -338 to 392°F	Excellent	Good	Excellent
TT (Extension Grade-EXTT)	PFA Teflon® or Neoflon	PFA Teflon® or Neoflon		-267 to 260°C -450 to 500°F	Excellent	Good	Excellent
KK	Kapton	Kapton		-267 to 316°C -450 to 600°F	Excellent	Good	Good
TG	Glass Braid	PFA Teflon® or Neoflon		-73 to 260°C -100 to 500°F	Good	Good	Excellent
GG (Extension Grade-EXGG)	Glass Braid	Glass Braid		-73 to 482°C -100 to 900°F	Poor	Good	Poor
HH	High Temp Glass Braid	High Temp Glass Braid		-73 to 704°C -100 to 1300°F	Poor	Good	Poor
XR	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)
XC Standard Braid XL-Loose Braid XT-Tight Braid	Nextel Braid	Nextel Braid		-73 to 1204°C -100 to 2200°F	Poor	Good	Poor
XS	Silica	Silica		-73 to 1038°C -100 to 1990°F	Poor	Good	Poor
TFE	TFE Teflon®	TFE Teflon®		-267 to 260°C -450 to 500°F	Excellent	Good	Excellent

ANSI color code shown | **To order IEC color code see pg. H-9**

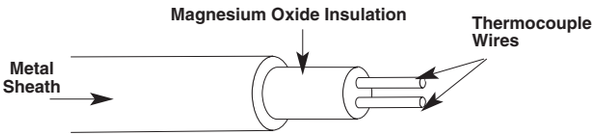
and Application Guide

Resistance To:					Comments
Solvent	Acid	Base	Flame	Humidity	
Fair	Good	Good	Good	Good	Color Coded PVC Extruded Over Each Bare Wire. PVC Applied Over Insulated Primaries. Affected by Ketones, Esters
Excellent	Excellent	Excellent	Excellent	Excellent	Color Coded PVC Extruded Over Each Bare Wire. PVC Applied Over Insulated Primaries. Affected by Ketones, Esters
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
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])
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)
Excellent	Excellent	Excellent	Excellent	Fair	0.12 mm Glass Braid Over Each Conductor, and Binder Impregnated. Overall Glass Braid Applied and Bindered. Binder Improves Moisture and Abrasion Resistance but Is Destroyed Above 204°C (400°F)
Excellent	Excellent	Excellent	Excellent	Fair	High Temp. Glass Braid Over Each Conductor, and Binder Impregnated. Overall High Temp Glass Braid Applied and Bindered. Binder Improves Moisture and Abrasion Resistance but Is Destroyed Above 400°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
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
Excellent	Good	Poor	Excellent	Fair	Silica Is a Very High Purity, Chemically Stable Yarn. (SiO2 Content 99%)
Excellent	Excellent	Excellent	Excellent	Excellent	Color Coded TFE Tape Applied to Conductors and Jacket. Superior Abrasion, Moisture, and Chemical Resistance.



ANSI color code shown | **To order IEC color code see pg. H-9**

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

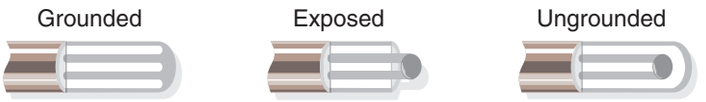
Material	Melting Point (°C/°F)	Continuous Maximum Temp. (°C/°F)	Tensile (PSI) Strength @93°C (200°F)	Tensile (PSI) Strength @ 537°C (1000°F)
304 SS	1405/2560	900/1650	68,000	15,000
310 SS	1405/2560	1150/2100	75,000	27,500
316 SS	1370/2500	925/1700	75,000	23,000
321 SS	1400/2550	870/1600	70,000	17,000
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"
J	760 (1400)	590 (1100)	480 (900)	370 (700)	370 (700)	320 (600)	315 (590)
K	1260 (2300)	1090 (2000)	980 (1800)	870 (1600)	870 (1600)	760 (1400)	590 (1100)
E	870 (1600)	650 (1200)	540 (1000)	430 (800)	430 (800)	370 (700)	320 (600)
T	370 (700)	370 (700)	260 (500)	200 (400)	200 (400)	150 (300)	
RX/SX	200 (400)	200 (400)	200 (400)	200 (400)	200 (400)	150 (300)	
N	1260 (2300)	1090 (2000)	980 (1800)	980 (1800)	980 (1800)	870 (1600)	
CX	472 (800)	472 (800)	472 (800)	472 (800)	472 (800)	400 (752)	

Common Thermocouple Junctions



Conductor Size Equivalents

Gage No.	AWG inches	AWG mm	SWG inches	SWG mm	GAGE No.	AWG inches	AWG mm	SWG inches	SWG 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	1.63	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

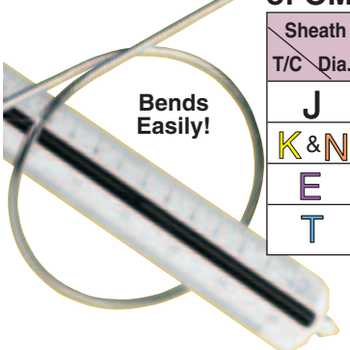
AWG = American Wire Gage
SWG = (British) Standard Wire Gage

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

Twisted Shielded Wire

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
J	260 (500)	260 (500)	260 (500)	440 (825)	480 (900)	520 (970)	620 (1150)	720 (1300)
K & N	700 (1290)	700 (1290)	700 (1290)	920 (1690)	1000 (1830)	1070 (1960)	1150 (2100)	1150 (2100)
E	300 (570)	300 (570)	300 (570)	510 (950)	580 (1075)	650 (1200)	730 (1350)	820 (1510)
T	260 (500)	260 (500)	260 (500)	260 (500)	260 (500)	315 (600)	370 (700)	370 (700)



Properties of Teflon® Insulation

The combination of chemical and physical properties of Teflon®/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, Teflon/Neoflon does not embrittle at very low temperatures.

NOW! AVAILABLE IN PRE-SPOOLED LENGTHS

General Properties of Neoflon and Teflon®

	Neoflon/Teflon® FEP	Neoflon/Teflon® PFA
Chemical Resistance: hydrocarbons, ethylene glycol, battery acid, brake fluids, 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

Mechanical and Electrical Properties

	Neoflon/Teflon FEP	Neoflon/Teflon PFA
Tensile strength, psi 23°C (73°F) ASTM D638	3,000	4,000
Elongation, % 23°C (73°F) ASTM D638	300	300
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	NO BREAK	NO BREAK
-54°C (-65°F)	10	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	118	
75°C	73	
Dielectric constant, ASTM D50	2.1	2.1
Volume resistivity, ohm-cm ASTM D257	10^{18}	10^{18}
Dissipation Factor, ASTM D150, 10^2 - 10^6 Hz	0.001	0.0004

Resistance vs. Wire Diameter *(Resistance in ohms per double foot @ 20°C [68°F])*

AWG No.	Diameter inches	Diameter mm	Type K †† CHROMEGA®/ ALOMEGA®	Type J Iron/ Constantan	Type T Copper/ Constantan	Type E CHROMEGA®/ Constantan	Type S Pt/ Pt10%Rh	Type R Pt/ Pt13%Rh	Type RX/SX Copper Alloy11**	Type C† W5%Re/ W26%Re	Type CX Alloy 405/ Alloy 426	Type G† W/ W26%Re	Type D† W3%Re/ W25%Re	Type BX Copper/ Copper*
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	0.001256
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	11.95	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

** Increase the resistance by 19% for nickel plated, type RTD wire*
† Not ANSI symbol
*** Maximum Resistance of reviewed wire*
†† Resistivity for N is 1.324 times type K values

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

Shown smaller than actual size.

Thermocouple Wire

To order IEC Color Coded Wire, add the suffix "I" after the thermocouple type letter

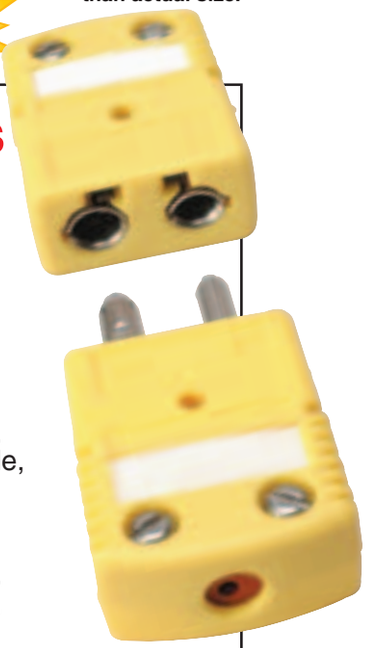
Examples:

TT-K-20-50M
Teflon® over Teflon® Insulation, Type K, ANSI Color Code, 20 Gage wire, 50 meters long

TT-KI-20-50M
Teflon® over Teflon® Insulation, Type K, IEC Color Code, 20 Gage wire, 50 meters long

Patented UNIVERSAL Female

Shown larger than actual size.



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

At OMEGA®, the mating connector and hardware are always included with probes!

Shown smaller than actual size.

OMEGACLAD® Probes

Shown actual size.

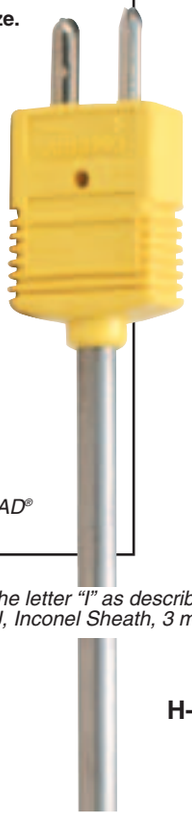
To order IEC Color Coded OMEGACLAD® Probes, add the suffix "I" before the "M" in the model number*

Examples:

JQIN-M30G-300
Type J, Inconel Sheath, 3 mm Diameter ANSI Color Code, 300 mm length

JQIN-IM30G-300
Type J, Inconel Sheath, 3 mm Diameter, IEC Color Code, 300 mm length

** Ordering with this code also includes the connector and wire attached to OMEGACLAD® probes where applicable.*



Insulated Wire Thermocouples

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

Note: *To order with JIS Color Codes, replace the letter "I" as described in the above examples with the letter "A".*
Ordering Example: JQIN-AM30G-300*, Type J, Inconel Sheath, 3 mm Diameter, JIS Color Code 300 mm length.*

omega.com®

Your One-Stop Source for Process Measurement and Control!

One Omega Drive | Stamford, CT 06907 | 1-888-TC-OMEGA (1-888-826-6342) | info@omega.com

www.omega.com

UNITED STATES
www.omega.com
1-800-TC-OMEGA
Stamford, CT.

UNITED KINGDOM
www. omega.co.uk
Manchester, England
0800-488-488

CANADA
www.omega.ca
Laval(Quebec)
1-800-TC-OMEGA

FRANCE
www.omega.fr
Guyancourt, France
088-466-342

GERMANY
www.omega.de
Deckenpfronn, Germany
0800-8266342

CZECH REPUBLIC
www.omegaeng.cz
Karviná, Czech Republic
596-311-899

BENELUX
www.omega.nl
Amstelveen, NL
0800-099-33-44

More than 100,000 Products Available!

• Temperature

Calibrators, Connectors, General Test and Measurement Instruments, Glass Bulb Thermometers, Handheld Instruments for Temperature Measurement, Ice Point References, Indicating Labels, Crayons, Cements and Lacquers, Infrared Temperature Measurement Instruments, Recorders Relative Humidity Measurement Instruments, RTD Probes, Elements and Assemblies, Temperature & Process Meters, Timers and Counters, Temperature and Process Controllers and Power Switching Devices, Thermistor Elements, Probes and Assemblies, Thermocouples Thermowells and Head and Well Assemblies, Transmitters, Wire

• Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

• pH and Conductivity

Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

• Data Acquisition

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

• Pressure, Strain and Force

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

• Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters

• *click here to go to the omega.com home page* •