

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%	0.9°F	Not Established	
G*C*D*	Temp Range	0 to 2320°C	32 to 4208°F	Not Established	
	Tolerance Value	4.5°C or 1.0%	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 [†]
J	Temp Range	-40 to 375°C	-40 to 333°C	Not Established
	Tolerance Value	±1.5°C	±2.5°C	
	Temp. Range	375 to 750°C	333 to 750°C	
	Tolerance Value	±0.4% Reading	±0.75% Reading	
K N	Temp Range	-40 to 375°C	-40 to 333°C	-167 to 40°C ±2.5°C -200 to -167°C ±1.5% Reading
	Tolerance Value	±1.5°C	±2.5°C	
	Temp. Range	375 to 1000°C	333 to 1200°C	
	Tolerance Value	±0.4%	±0.75% Reading	
T	Temp Range	-40 to 125°C	-40 to 133°C	-67 to 40°C ±1°C -200 to -67°C ±1.5% Reading
	Tolerance Value	±0.5°C	±1°C	
	Temp. Range	125 to 350°C	133 to 350°C	
	Tolerance Value	±0.4% Reading	±0.75% Reading	
E	Temp Range	-40 to 375°C	-40 to 333°C	-167 to 40°C ±2.5°C -200 to -167°C ±1.5% Reading
	Tolerance Value	±1.5°C	±2.5°C	
	Temp. Range	375 to 800°C	333 to 900°C	
	Tolerance Value	±0.4% Reading	±0.75% Reading	
R S	Temp Range	0 to 1100°C	0 to 600°C	Not Established
	Tolerance Value	±1°C	±1.5°C	
	Temp. Range	1100 to 1600°C	600 to 1600°C	
	Tolerance Value	±[1 + 0.3% x (Rdg-1100)]°C	±0.25% Reading	
B	Temp Range	Not Established	600 to 1700°C	600 to 800°C +4°C 800 to 1700°C ±0.5% Reading
	Tolerance Value	Not Established	±0.25% Reading	
	Temp. Range	Not Established	600 to 1700°C	
	Tolerance Value	Not Established	±0.25% 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.