

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 |
| | 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 | 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 |
| | Tolerance Value | Not Established | ±0.25% Reading | +4°C |
| | Temp. Range | Not Established | 600 to 1700°C | 800 to 1700°C |
| | Tolerance Value | Not Established | ±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.