

THERMOCOUPLE INITIAL MATERIAL TOLERANCES

ANSI Limits of error Thermocouples Reference Junction 0°C(32°F). Published in ANSI Circular MC 96.1-1982

Note: 1/4 limits available on request

TYPE	TEMPERATURE RANGE °C(°F) FOR STANDARD LIMITS OF ERROR	STANDARD LIMITS OF ERROR °C(°F)	TEMPERATURE RANGE °C(°F) FOR SPECIAL LIMITS OF ERROR	SPECIAL LIMITS OF ERROR °C(°F)
J	0 to 293 (32 to 559) 293 to 760 (559 to 1400)	± 2.2 (+4.0) ± 0.75%	0 to 275 (32 to 537) 275 to 760 (527 to 1400)	± 1.1 (+2.0) ± 0.4%
K	-200 to -110 (-328 to -166) -110 to 0 (-166 to 32) 0 to 293 (32 to 559) 293 to 1250 (559 to 2282)	± 2% ± 2.2 (+4.0) * ± 2.2 (+4.0) ± 0.75%	0 to 275 (32 to 527) 275 to 1250 (527 to 2282)	** ** ± 1.1 (+2.0) ± 0.4%
T	-200 to -67 (-328 to -89) -67 to 0 (-89 to 32) 0 to 133 (32 to 271) 133 to 350 (271 to 662)	± 1.5% ± 1 (+1.8) * ± 1 (+1.8) ± 0.75%	0 to 125 (32 to 257) 125 to 350 (527 to 662)	** ** ± 0.5 (+0.9) ± 0.4%
E	-200 to -170 (-328 to -274) -170 to 0 (-274 to 32) 0 to 340 (32 to 664) 340 to 900 (664 to 1652)	± 1% ± 1.7 (+3.1) * ± 1.7 (+3.1) ± 0.5%	0 to 250 (32 to 482) 250 to 900 (482 to 1652)	** ** ± 1 (+1.8) ± 0.4%
R	0 to 600 (32 to 1112) 600 to 1450 (1112 to 2642)	± 1.5 (+2.7) ± 0.25%	0 to 600 (32 to 1112) 600 to 1450 (1112 to 2642)	± 0.6 (+1.1) ± 0.1%
B	800 to 1700 (1472 to 3092)	± 0.5%	800 to 1700 (1472 to 3092)	--

* Thermocouples and thermocouple materials are supplied to meet limits of error specified for temperature above 0°C. A thermocouple material may not conform to the published sub-zero limits of error for that material when purchased, unless conformance is agreed to.

** Special limits of error for sub-zero temperatures have not yet been established. The following limits for calibrations E and T are useful to start discussion.
-200 to 0°C
Type E: 1°C or 0.5%, whichever is greater
Type T: ±5°C or 0.8%, whichever is greater

Sub-zero limits of error for Type J and sub-zero special limits of error for Type K are not considered because of the characteristics of the materials.

Non ANSI limits of error thermocouples

TYPE	TEMPERATURE RANGE °C(°F)	LIMITS OF ERROR °C(°F)
C	0 to 427 (32 to 800) 427 to 2316 (800 to 4200)	± 4.4 (+8.0) ± 1%
M	0 to 1287 (32 to 2349)	± 0.75%
N	0 to 1250 (32 to 2282)	± 2.2 (+4.0) ± 0.75%