

The tolerances shown in the table below apply to new, essentially homogeneous thermocouple wire in the size range of 30 AWG to 8 AWG. These tolerances only apply to thermocouples used at temperatures not exceeding the recommended limits. If thermocouples are used at temperatures above the recommended limits, or in detrimental environments, the below stated tolerances may not apply.

Tolerances on Initial Values of EMF vs Temperature for Thermocouples

Reference Junction 0 °C [32 °F]. Published in ASTM E230

TYPE	TEMPERATURE RANGE for STANDARD TOLERANCES	STANDARD TOLERANCES	TEMPERATURE RANGE for SPECIAL TOLERANCES	SPECIAL TOLERANCES
J	(0 to 293) °C [32 to 559] °F (293 to 760) °C [559 to 1400] °F	± 2.2 °C [± 4 °F] ± 0.75%	(0 to 275) °C [32 to 527] °F (275 to 760) °C [527 to 1400] °F	± 1.1 °C [± 2 °F] ± 0.4%
K	(-200 to -110) °C [-328 to -166] °F (-110 to 0) °C [-166 to 32] °F (0 to 293) °C [32 to 559] °F (293 to 1260) °C [559 to 2300] °F	± 2% ^[1] ± 2.2 °C [± 4 °F] ^[1] ± 2.2 °C [± 4 °F] ± 0.75%	(0 to 275) °C [32 to 527] °F (275 to 1260) °C [527 to 2300] °F	^[2] ^[2] ± 1.1 °C [± 2 °F] ± 0.4%
N	(0 to 293) °C [32 to 559] °F (293 to 1260) °C [559 to 2300] °F	± 2.2 °C [± 4 °F] ^[1] ± 0.75%	(0 to 275) °C [32 to 527] °F (275 to 1260) °C [527 to 2300] °F	± 1.1 °C [± 2 °F] ± 0.4%
T	(-200 to -67) °C [-328 to -89] °F (-67 to 0) °C [-89 to 32] °F (0 to 133) °C [32 to 271] °F (133 to 370) °C [271 to 700] °F	± 1.5% ^[1] ± 1 °C [± 1.8 °F] ^[1] ± 1 °C [± 1.8 °F] ± 0.75%	(0 to 125) °C [32 to 257] °F (125 to 370) °C [257 to 700] °F	^[2] ^[2] ± 0.5 °C [± 0.9 °F] ± 0.4%
E	(0 to 870) °C [32 to 1600] °F	± 1.7 °C [± 3.06 °F] ^[3] or ± 0.5%	(0 to 870) °C [32 to 1600] °F	± 1.0 °C [± 1.8 °F] ^[3] or ± 0.4%
R	(0 to 600) °C [32 to 1112] °F (600 to 1480) °C [1112 to 2700] °F	± 1.5 °C [± 2.7 °F] ± 0.25%	(0 to 600) °C [32 to 1112] °F (600 to 1480) °C [1112 to 2700] °F	± 0.6 °C [± 1.1 °F] ± 0.1%
S	(0 to 600) °C [32 to 1112] °F (600 to 1480) °C [1112 to 2700] °F	± 1.5 °C [± 2.7 °F] ± 0.25%	(0 to 600) °C [32 to 1112] °F (600 to 1480) °C [1112 to 2700] °F	± 0.6 °C [± 1.1 °F] ± 0.1%
B	(870 to 1700) °C [1600 to 3100] °F	± 0.5%	(870 to 1700) °C [1600 to 3100] °F	± 0.25%
C	(0 to 400) °C [32 to 752] °F (400 to 2315) °C [752 to 4200] °F	± 4.4 °C [± 8 °F] ± 1.0%	Not Available	

[1] Thermocouples and thermocouple materials are supplied to meet the tolerance specified for temperatures 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 upon by customer and Pyromation when ordering.

[2] Special tolerances for sub-zero temperatures have not yet been established. The following limits for calibrations of types E and T are useful to start discussion between customer and Pyromation.

(-200 to 0) °C Type T ± 0.5 °C or ± 0.8%, whichever is greater

[3] The standard tolerances shown do not apply to Type E mineral-insulated, metal-sheathed (MIMS) thermocouples and thermocouple cables. The standard tolerances for MIMS Type E constructions are the greater of ± 2.2 °C or ± 0.75 % from 0 to 870 °C and the greater of ± 2.2 °C or ± 2 % from -200 to 0 °C.

Initial values of tolerance for Type J and special tolerance for Type K thermocouples below 0 °C are not given due to the characteristics of the materials.

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CODE	MATERIAL	TEMPERATURE RANGE	TOLERANCE
M	Ni18Mo/Ni	(-50 to 1410) °C [-58 to 2570] °F	± 0.75%
P	Platinel® II	(0 to 1395) °C [32 to 4200] °F	± 0.10 mV

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