

Tungsten-Rhenium Twisted Beaded Thermocouples

Tungsten-rhenium thermocouples were developed to meet the requirements for measuring ultra-high temperatures in the 2760°C (5000°F) range.

OMEGA sells 3 widely used tungsten-rhenium thermocouple calibrations: tungsten versus tungsten-26% rhenium, tungsten-5% rhenium versus tungsten-26% rhenium, and tungsten-3% rhenium versus tungsten-25% rhenium.

OMEGA® tungsten-rhenium thermocouples conform to the limits of error listed in the table below.

Because of the inherent brittleness of unalloyed tungsten, the tungsten versus tungsten-26% rhenium thermocouples are more difficult to handle than the tungsten-5% rhenium versus tungsten-26% rhenium combination.

The average emf of the W-3% Re/W-25% Re is slightly less than that of W/W-26% Re and slightly more than that of W-5% Re/W-26% Re. The ductility of W-3% Re is about equal to that of W-5% Re, but superior to that of unalloyed tungsten.

All 3 thermocouple calibrations can be used to 2760°C (5000°F) in hydrogen or inert gas atmospheres and in a vacuum. They deteriorate rapidly under oxidizing conditions and should not be used in air or atmospheres containing oxygen.

OMEGA tungsten-rhenium thermocouples come in 300 mm (12") lengths, which corresponds to each for a 600 mm (24") total length. Longer lead lengths are available; consult sales.



Limits of Error for Tungsten-Rhenium Thermocouple Wire Combinations

Wire Diameter mm (inch)	Temperature Range (†)	Maximum Error or Departure
0.075 (0.003)	0 to 425°C (32 to 800°F) 426 to 1750°C (800 to 3200°F)	±4.5°C (±8°F) ±1%
0.125 (0.005)	0 to 425°C (32 to 800°F) 426 to 1975°C (800 to 3600°F)	±4.5°C (±8°F) ±1%
0.25 to 0.50 (0.010 to 0.020)	0 to 425°C (32 to 800°F) 426 to 2325°C (800 to 4200°F)	±4.5°C (±8°F) ±1%

† Up to 2760°C (5000°F) for short-term exposure.

To Order		
Materials	Wire Diameter mm (inch)	Unsheathed Model No.**
G Tungsten- Tungsten 26% Re	0.075 (0.003)	TOR-003-12
	0.125 (0.005)	TOR-005-12
	0.250 (0.010)	TOR-010-12
	0.381 (0.015)	TOR-015-12
	0.500 (0.020)	TOR-020-12
C* Tungsten 5% Re- Tungsten 26% Re	0.075 (0.003)	T5R-003-12
	0.125 (0.005)	T5R-005-12
	0.250 (0.010)	T5R-010-12
	0.381 (0.015)	T5R-015-12
	0.500 (0.020)	T5R-020-12
D Tungsten 3% Re- Tungsten 25% Re	0.127 (0.005)	T3R-005-12
	0.250 (0.010)	T3R-010-12
	0.381 (0.015)	T3R-015-12
	0.500 (0.020)	T3R-020-12

* Most popular of the 3 tungsten-rhenium thermocouples; a large selection of instrumentation is available.

** Tungsten-rhenium alloy thermocouples are supplied in standard 300 mm (12") lengths [600 mm (24") loops]. Change suffix "-12" in model number to indicate additional length (in inches) required. Consult Sales for other sizes.

Ordering Example: T5R-005-12, 300 mm (12"), Type C thermocouple, 0.125 mm (0.005") diameter.