

## Thermocouple Calibration Selection

Thermocouple Calibration	B & S Wire Gauge	Recommended Temperature Limits °F (with Thermocouple in Closed-End Tube or Well)	Conditions For Which Each Is Best Suited
<b>Type J</b>	8 ga. (.128") 14 ga. (.064") 20 ga. (.032") 24 ga. (0.20")	0 to 1400 0 to 1100 0 to 900 0 to 700	Suitable for use in reducing or neutral atmospheres. Since oxidation of the iron wire occurs rapidly at temperatures above 1000F, the heavier gauge wires should be used at those temperatures. Iron wire may be attacked by ammonia, hydrogen and nitrogen if not protected.
<b>Type K</b>	8 ga. (.128") 14 ga. (.064") 20 ga. (.032") 24 ga. (0.20")	0 to 2300 0 to 2000 0 to 1800 0 to 1600	Suitable for use in reducing or neutral atmospheres. Recommended for use in temperature ranges from 1000 F to 2000 F. Accuracy below 900 F is greatly reduced after prolonged use above 1400 F. Should not be used in reducing atmosphere if unprotected.
<b>Type T</b>	8 ga. (.128") 14 ga. (.064") 20 ga. (.032") 24 ga. (0.20")	-300 to +700 -300 to +500 -300 to +400	Recommended for use in oxidizing atmospheres. It has high corrosive resistance to moisture and is excellent for very low temperature applications.
<b>Type E</b>	8 ga. (.128") 14 ga. (.064") 20 ga. (.032") 24 ga. (0.20")	-300 to +1600 -300 to +1400 -300 to +1200	Recommended for use in oxidizing atmospheres. It exhibits good resistance to corrosion at low temperatures. Greatest EMF output of standard calibrations. Recommended for computer applications.
<b>Type R or S</b>	24 ga. (0.20")	0 to 2700	Recommended only for the higher temperature applications. Protection from all atmospheres must be provided, as they are subject to contamination and subsequent calibration drift. Type R is more sensitive and used in industrial application. Type S is commonly used for calibration.
<b>Type B</b>	24 ga. (0.20")	1600 to 3100°F	Better stability and higher temperatures than Type R or S. Requires the use of alumina insulators and protection tubes. Easily contaminated in other than oxidizing atmospheres.

## Sheath Material Selection (Metal Sheathed Thermocouples)

Material	Maximum Operating Temperature	Remarks
304 SS	1600°F	Standard for types J, T & E thermocouples. Good resistance to oxidation and corrosion. Good general purpose austenitic stainless steel.
Inconel 600	2100°F	Standard for Type K thermocouples. Good in severely corrosive environments. Good strength and oxidation resistance at high temperatures. Do not use in presence of sulfur above 1000°F.
310 SS	2100°F	Suitable for sulfur bearing atmospheres. Good resistance to oxidation to 2000°F.
316 SS	1650°F	Higher corrosion resistance than 304 SS. Good in sulfuric acid compound.
347 SS	1600°F	Good resistance to corrosion. Columbium stabilized to prevent carbide precipitation found in 304 SS, 316 SS, and 310 SS between 800 - 1500°F.