

MGO VS HOLLOW TUBE

Bayonet thermocouples can be constructed with Magnesium Oxide sheath material or hollow tube units made with lead wires inserted in tubing. Magnesium Oxide (MgO) insulation is a dry, uncontaminated, compacted ceramic powder. MgO gives the thermocouple high insulation resistance and dielectric strength. Also, it allows excellent insulation of the positive and negative wire conductors in relation to each other and to the outer sheath. Among the outstanding features of sheath material are: (A) flexibility to bend or form to twice the radius of the sheath diameter, (B) its rigidity to maintain size and shape after bending or straightening, (C) vibration or shock has no effect on the material, (D) sheath material withstands pressures upward to 50,000 psi, and (E) sheath material may be used in applications where temperatures may range from -400° to 3000°F depending on requirements and selection of materials.

| INSULATOR | PURITY % | MELTING POINT | | USABLE TEMP. | |
|----------------------|----------------------|---------------|------|--------------|------|
| | | °C | °F | °C | °F |
| Magnesium Oxide(MgO) | 96.4% (STD) | 2790 | 5050 | 1650 | 3000 |
| | 99.4% (must specify) | | | | |
| | 99.8% (must specify) | | | | |

New insulation materials are being developed. Use an X and describe to specify.

The hollow-tube design is used for disposable thermocouples that can be replaced easily. Their life is about half of that of a Magnesium Oxide insulated thermocouple. The advantage of a hollow-tube design is the cost. It is the least expensive design for the short run.