

MC-1

METAL-CERAMIC THERMOCOUPLE PROTECTION TUBE



MC-1 thermocouple protection tubes are a unique blend of metal and ceramic, exhibiting properties not found solely in either individual material. The ceramic is a slip-cast composite of chromium and aluminum oxide. During the chromium-metal phase, it takes on a very tightly bonded layer of chromium oxide, which together with the inert nature of the alumina, provides this material with its remarkable resistance to oxidizing atmospheres over 1204°C (2200°F). MC-1 tubes offer high thermal conductivity and excellent sensitivity to temperature changes in high-temperature applications. Preheating to 482°C (900°F) before immersion in molten metal at 1093°C (2000°F) or higher is recommended.

APPLICATIONS:

- Molten copper and brass to 1149°C (2100°F)
- Corrosive SO₂ and SO₃ gas to 1371°C (2500°F) and SO₃ and HF gas to 1093°C (2000°F)
- Molten zinc to 871°C (1600°F)
- Molten lead to 343°C (650°F)
- Atmosphere directly above molten glass in an open hearth glass furnace
- Carbon bake furnaces
- Steel mill soaking pits
- ***Not recommended for use in molten aluminium or glass, carburizing or nitriding atmospheres, cryolite, or copper alloys above 1149°C (2100°F)***

ADVANTAGES:

- Excellent oxidation resistance
- Thermal conductivity comparable to that of stainless steel
- Resists wetting by many metals and alloys, and basic furnace slags
- Resistant to oxidizing atmospheres over 1204°C (2200°F)
- Good wear resistance/resistance to sliding friction
- Good strength at temperatures up to 1538°C (2800°F)
- Low porosity prohibits gas ingress

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AVAILABILITY:

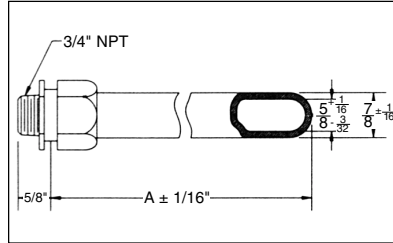
Tube lengths

22.9, 30.5, 45.7, 61, 76.2, 91.4, 106.7, 121.9 cm

9, 12, 18, 24, 30, 36, 42, 48 in

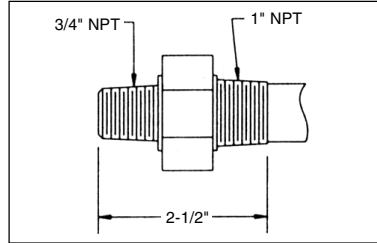
Note: Special lengths and fittings are available upon request.

Connector fittings



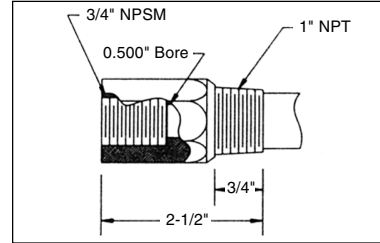
Type A

EMT connector, gland compression, zinc plated steel body with zinc plated malleable iron nut.



TYPE B

Cold rolled steel fitting with 1-3/8" Hex, cemented to the tube. Provides threads for head and furnace mounting.



TYPE C

Same as type B except provided with internal thread.

TECHNICAL DATA

Density

5.8 gm/cc

Thermal conductivity

17 BTU-ft/ft²-hr°F

Coefficient of thermal expansion

5 x 10⁻⁶ in/in/°F

Flexural strength

45,000 psi

Compressive strength

110,000 psi

Hardness

34 Rc

ID size

Will pass a 33/64-inch diameter x 2-inch long probe through the full length of the tube.

Straightness

3/16-inch per foot of length as measured chord to arc

Chemical Composition

Cr-77%, Al₂O₃-23%

Advanced Metals Processing Technology

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Note: the physical and chemical properties listed represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice.

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