

# SteelMelt

## THERMOCOUPLE PROTECTION TUBE

**Alloy of metal and ceramic for continuous use in molten baths**

### FEATURES

- Quick response
- Maintenance-free
- Prolonged Service life
- High oxidation resistance
- No contamination of the bath
- Excellent thermal shock resistance
- Low thermal expansion coefficient
- No corrosion from molten steel
- High strength up to 1,600°C covering the range of molten steel



### DESCRIPTION

**SteelMelt** is composite of high melting point metal, Molybdenum and high melting point ceramic oxide, Zirconia. This combination results in material with superior strength at very high temperatures, excellent thermal shock resistance, low heat capacity and no chemical reaction to molten steel and slag, suitable for prolonged use in molten baths, even where there are rapid temperature fluctuations.

**SteelMelt** has solved the long existing problem of brittleness of ceramic thermocouple tubes while still retaining their properties of heat, abrasion and corrosion resistance. Moreover, due to impermeable and non-wetting surface of SteelMelt, the thermocouples assemblies need no daily washing or coating thereby proving maintenance-free use in molten baths, much longer than any other protection tube material.

**SteelMelt** thermocouple protection tubes require no preheating due to their low thermal expansion coefficient and thermal shock resistance. **SteelMelt** tubes can be immersed without preheating, directly to molten steel at 1600°C and can be immersed in water just after taking out from molten steel bath. Their low heat conductivity helps to prevent temperature drop in the molten bath and contributes to energy conservation.

## TECHNICAL PROPERTIES OF STEELMELT

	MZA-10	MZA-25	MZA-40
Bulk density (g/cm <sup>3</sup> )	8.5	7.9	7.5
Vickers hardness (Kg/mm <sup>2</sup> )	200	220	240
Extension (kg/ mm <sup>3</sup> )	30	20.5	16.0
Bending (kg/ cm <sup>3</sup> )	3500	2700	2000
Thermal conductivity (cal/cmsec°C)	0.40	0.28	0.25
Specific Heat (cal/g°C)	0.042	0.056	0.060
Thermal Expansion at temp 20°C ~ 1,000°C (°C <sup>-1</sup> )	5.8x10 <sup>-6</sup>	6.0x10 <sup>-6</sup>	6.5x10 <sup>-6</sup>
Response Time RT to 1,500°C (sec)	35	40	45
Fusion Point (°C)	2,620	2,620	2,620
Suggested application	Furnace Tube (for Zn, Cu bath)	Thermocouple Protection tube	Anti-corrosive Protection tube

## STANDARD SIZES (in mm)

O.D.(mm)	I.D.(mm)	Standard length (mm)
13	7	100, 200, 300, 400, 500, 600
18	10	100, 200, 300, 400, 500, 600
25	15	100, 200, 300, 400, 500, 600
If specified at the time of order, machining can be done for any special mounting arrangement		

### APPLICATION

For continuous immersion in

- Molten Steel bath, continuous steel manufacturing, tundish and mold etc.  
(expected service life 100~250 hours under ideal conditions)
- Molten Pig Iron, molten Cast Iron and other molten metal  
(expected service life of 150~300 hours under ideal conditions)

DUE TO CONTINUOUS PRODUCT IMPROVEMENT, THE DESIGN AND TECHNICAL SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE

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