

# High Temperature MI Thermocouple Cable

## Features

- (1) Though 500°C to 650°C was a limit, SUPER COUPLE 1000 has the durability which exceeds this in usual extreme diameter of metal sheathed thermocouple.
- (2) A product beyond the outside diameter 3.2 became possible (it can be used under high temperature (MAX. 1000-1200°C), too).
- (3) It can be applied to the reduction atmosphere as well as atmosphere contains hydrogen (H<sub>2</sub>).
- (4) The nickel based special alloy (It is equivalent of HOSKINS 2300) is used for the sheath quality of the material, and this alloy is responsible for the durability increased of thermocouple.



## Description

High Temperature MI Thermocouple cables by TBS, for fabricating thermocouples are used in applications ranging from 1100° to 2200°C. Thermocouple types R, S, B and AE (Tungsten 5% Rhenium vs. Tungsten 26% Rhenium or type C) are available in a variety of sheath and insulation combinations.

### Type S / Type R

Platinum 10% Rhodium versus Platinum / Platinum 13% Rhodium versus Platinum

Sheath Material	Sheath Diameter (inches)	Sheath Diameter (cm)	Insulation
Inconel 600	0.040	0.1016	MgO
Inconel 600	0.062	0.1574	MgO
Inconel 600	0.125	0.3175	MgO
Inconel 600	0.188	0.4775	MgO
Inconel 600	0.250	0.635	MgO
Platinum 10% Rhodium	0.040	0.1016	MgO
Platinum 10% Rhodium	0.062	0.1574	MgO
Platinum 10% Rhodium	0.125	0.3175	MgO
Tantalum	0.040	0.1016	MgO
Tantalum	0.062	0.1574	MgO
Tantalum	0.125	0.3175	MgO

### Type B

Platinum 30% Rhodium versus Platinum 6% Rhodium

Sheath Material	Sheath Diameter (inches)	Sheath Diameter (cm)	Insulation
Inconel 600	0.040	0.1016	MgO
Inconel 600	0.062	0.1574	MgO
Inconel 600	0.125	0.3175	MgO
Inconel 600	0.250	0.635	MgO

Type AE (Also Known as Type C)  
Tungsten 5% Rhenium versus Tungsten 26% Rhenium

Sheath Material	Sheath Diameter (inches)	Sheath Diameter (cm)	Insulation
Tantalum	0.040	0.1016	MgO
Tantalum	0.062	0.1574	MgO
Tantalum	0.125	0.3175	MgO
Tantalum	0.062	0.1574	BeO
Tantalum	0.125	0.3175	BeO
Tantalum	0.062	0.1574	HfO <sub>2</sub>
Tantalum	0.125	0.3175	HfO <sub>2</sub>
Niobium 1% Zirconium	0.062	0.1574	BeO
Niobium 1% Zirconium	0.125	0.3175	BeO
Niobium 1% Zirconium	0.062	0.1574	HfO <sub>2</sub>
Niobium 1% Zirconium	0.125	0.3175	HfO <sub>2</sub>

# Specifications

## THERMOCOUPLE WIRE TYPES

THERMOCOUPLE COMBINATIONS	Calibration Type	ARI SYMBOL	STANDARD LIMITS OF ERROR	RECOMMENDED TEMPERATURE RANGE
Platinum 10% Rhodium (+) Vs. Platinum (-)	S	S	±1.5°C or .25% Per ASTM E-230	0-1450°C
Platinum 13% Rhodium (+) Vs. Platinum (-)	R	R	±1.5°C or .25% Per ASTM E-230	0-1450°C
Platinum 30% Rhodium (+) Vs. Platinum 6% Rhodium (-)	B	B	±0.5%	870-1700°C
Tungsten 5% Rhenium (+) Vs Tungsten 26% Rhenium (-)	C	AE	±4.4°C (0-426°C) ±1% (426-2315°C) Per ASTM E-988	0-2200°C

## SHEATH MATERIALS

SHEATH TYPE	ARI SYMBOL	RECOMMENDED MAX. TEMP	ALLOWABLE ENVIRONMENT	MIN. BEND RADIUS
Inconel 600	B	1175°C.	Inert, Vacuum, Oxidizing	5 X Sheath Diameter
Platinum 10% Rhodium	AH	1550°C.	Inert, Oxidizing	5 X Sheath Diameter
Tantalum	N	2200°C.	Inert, Vacuum	10 X Sheath Diameter
Niobium 1% Zirconium	AV	2200°C.	Inert, Vacuum	10 X Sheath Diameter

## PHYSICAL/MECHANICAL CHARACTERISTICS

Sheath Diameter (inches)	Sheath Diameter Tolerance (inches)	Wall Thickness (inches)	Wall Thickness Tolerance (inches)	Wire Diameter (inches)	Wire Diameter Tolerance (inches)
0.040	±0.002	0.006	±0.002	0.007	±0.002
0.062	±0.002	0.010	±0.002	0.010	±0.001
0.125	±0.002	0.017	±0.002	0.010	±0.0015
0.188	±0.002	0.028	±0.004	0.018	±0.0015
0.250	±0.002	0.038	±0.0055	0.020	±0.002

The above dimensions are only valid for Inconel Sheath with type R or S wires. Sheath, wall thickness and wire diameters/tolerances may vary based on other sheath and wire combinations.

Due to continuous product improvement, the design and technical specifications are to subject change without prior notice

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