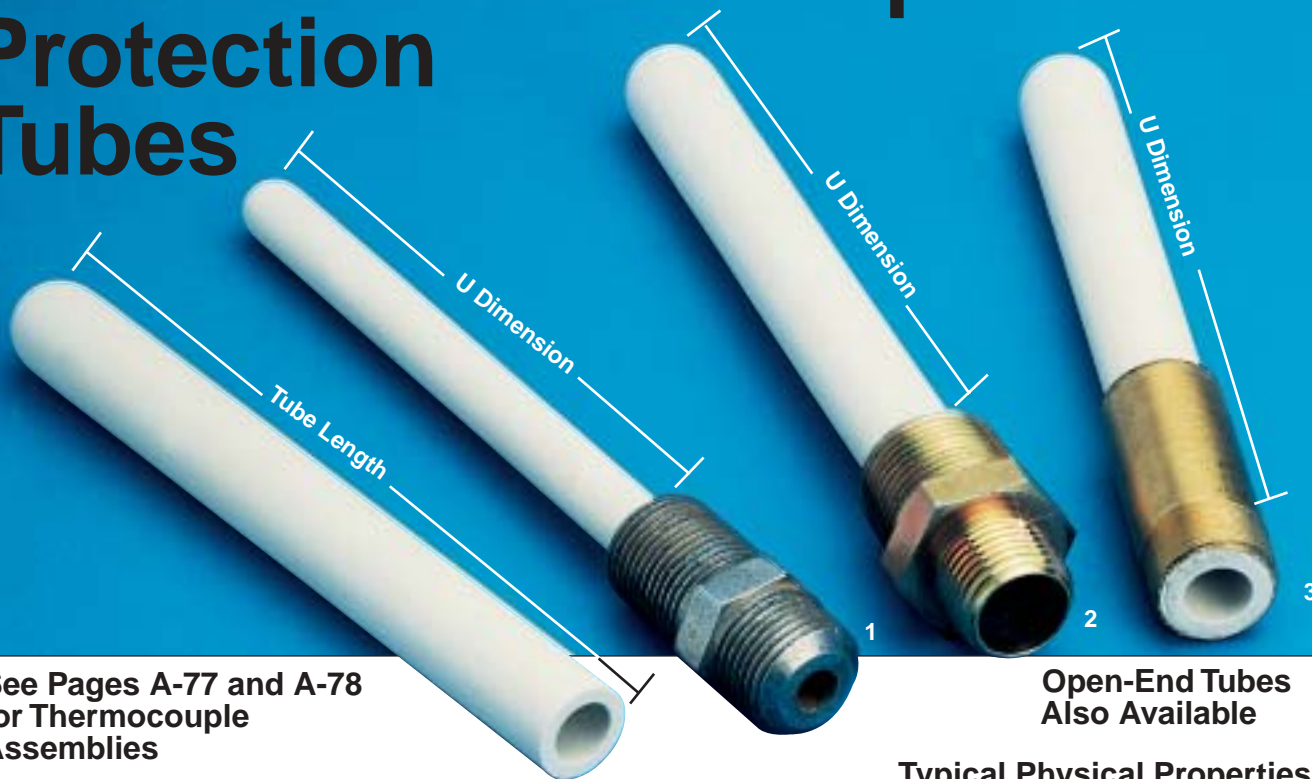


Ceramic Thermocouple Protection Tubes



See Pages A-77 and A-78 for Thermocouple Assemblies

Open-End Tubes Also Available

Typical Physical Properties

Properties	OMEGATITE™ 450	OMEGATITE™ 300
Composition	99.8% Al ₂ O ₃	85% Mullite 15% Glass
Water Absorption	0.00	0.00
Specific Gravity KP/CM ³	3.85	2.8
Gas Permeability	Gas Tight	Gas Tight
Compressive Strength (MPa)	>2,000	>1,300
Tensile Strength (MPa)	206	124
Transverse Strength (MPa)	379	186
Coefficient of Linear Thermal Expansion 24 to 250°C (75 to 480°F) 24 to 500°C (75 to 930°F) 24 to 1000°C (75 to 1830°F) 24 to 1500°C (75 to 2730°F)	6.2 x 10 ⁻⁶ 7.4 x 10 ⁻⁶ 8.5 x 10 ⁻⁶ 9.8 x 10 ⁻⁶	3.3 x 10 ⁻⁶ 4.0 x 10 ⁻⁶ 5.0 x 10 ⁻⁶ -
Approximate Thermal Conductivity W/(m ² , K/m) 24°C (75°F) 800°C (1470°F)	33 8.6	5.8 3.6
Maximum Service Temperature	1950°C (3540°F)	1750°C (3180°F)
Dielectric Constant (1MC)	9.29	5.80
Dielectric Strength (volts/mil)	>230	250
Volume Resistivity (ohm cm)	10 ¹³	10 ¹³
Te Value (Volume Resistivity of 1 mega Ω cm)	800°C (1470°F)	800°C (1470°F)
Hardness (Mohs Scale)	9	7.5
Fabrication Methods	Cast	Cast

Tolerance: ±5%

Typical Chemical Analyses

	Al ₂ O ₃	SiO ₂	MgO	Na ₂ O	CaO	Fe ₂ O ₃	Cr ₂ O ₃	TiO ₂	MnO	ZrO ₂	K ₂ O
OMEGATITE™ 450	99.8	.070	.050	.005	.030	.025	<.003	.004	.001	-	<.001
OMEGATITE™ 300	60.0	38.0	.2	.2	.1	.5	-	.5	-	-	.700

Note: All properties are average for test specimens. Tests were performed according to ASTM Specifications.



Ceramic Thermocouple Protection Tubes

To Order (Specify Model No.)						
Dimensions			PTRA OMEGATITE® 450		PTRM OMEGATITE® 300	
Inside Dia. mm (in.)	Outside Dia. mm (in.)	Tube Length*	Model Number	Price	Model Number	Price
1.6 (1/16")	3.2 (1/8")	300mm	PTRA-11618-M300	£22.25	PTRM-11618-M300	£11.50
		450mm	PTRA-11618-M450	33.00	PTRM-11618-M450	17.25
		600mm	PTRA-11618-M600	44.50	PTRM-11618-M600	23.00
2.0 (5/64")	4.0 (5/32")	300mm	PTRA-564532-M300	22.25	PTRM-564532-M300	11.50
		450mm	PTRA-564532-M450	33.00	PTRM-564532-M450	17.25
		600mm	PTRA-564532-M600	44.50	PTRM-564532-M600	23.00
4.0 (5/32")	6.4 (1/4")	300mm	PTRA-53214-M300	22.25	PTRM-53214-M300	11.50
		450mm	PTRA-53214-M450	33.00	PTRM-53214-M450	17.25
		600mm	PTRA-53214-M600	44.50	PTRM-53214-M600	23.00
4.8 (3/16")	6.4 (1/4")	300mm	PTRA-31614-M300	22.25	PTRM-31614-M300	11.50
		450mm	PTRA-31614-M450	33.00	PTRM-31614-M450	17.25
		600mm	PTRA-31614-M600	44.50	PTRM-31614-M600	23.00
4.8 (3/16")	7.9 (5/16")	300mm	PTRA-316516-M300	22.25	PTRM-316516-M300	11.50
		450mm	PTRA-316516-M450	33.00	PTRM-316516-M450	17.25
		600mm	PTRA-316516-M600	44.50	PTRM-316516-M600	23.00
6.4 (1/4")	9.5 (3/8")	300mm	PTRA-1438-M300	22.25	PTRM-1438-M300	11.50
		450mm	PTRA-1438-M450	33.00	PTRM-1438-M450	17.25
		600mm	PTRA-1438-M600	44.50	PTRM-1438-M600	23.00
7.9 (5/16")	11.1 (7/16")	300mm	PTRA-516716-M300	26.00		
		450mm	PTRA-516716-M450	39.50		
		600mm	PTRA-516716-M600	52.00		
7.9 (5/16")	12.7 (1/2")	300mm	PTRA-51612-M300	22.25	PTRM-51612-M300	11.50
		450mm	PTRA-51612-M450	33.00	PTRM-51612-M450	17.25
		600mm	PTRA-51612-M600	44.50	PTRM-51612-M600	23.00
9.5 (3/8")	12.7 (1/2")	300mm	PTRA-3812-M300	23.75	PTRM-3812-M300	11.50
		450mm	PTRA-3812-M450	35.50	PTRM-3812-M450	17.25
		600mm	PTRA-3812-M600	46.50	PTRM-3812-M600	23.00
11.1 (7/16")	17.5 (11/16")	300mm	PTRA-7161116-M300	23.75	PTRM-7161116-M300	11.50
		450mm	PTRA-7161116-M450	35.50	PTRM-7161116-M450	17.25
		600mm	PTRA-7161116-M600	46.50	PTRM-7161116-M600	23.00
12.7 (1/2")	19.0 (3/4")	300mm	PTRA-1234-M300	23.00	PTRM-1234-M300	13.00
		450mm	PTRA-1234-M450	34.50	PTRM-1234-M450	18.75
		600mm	PTRA-1234-M600	46.00	PTRM-1234-M600	24.50
15.8 (5/8")	22.2 (7/8")	300mm	PTRA-5878-M300	33.00	PTRM-5878-M300	28.50
		450mm	PTRA-5878-M450	49.00	PTRM-5878-M450	42.50
		600mm	PTRA-5878-M600	66.00	PTRM-5878-M600	57.00
19.0 (3/4")	25.4 (1")	300mm	PTRA-341-M300	33.00	PTRM-341-M300	26.00
		450mm	PTRA-341-M450	49.00	PTRM-341-M450	40.00
		600mm	PTRA-341-M600	66.00	PTRM-341-M600	53.00
22.2 (7/8")	28.6 (1 1/8")	300mm	PTRA-78118-M300	41.00	PTRM-78118-M300	40.00
		450mm	PTRA-78118-M450	62.00	PTRM-78118-M450	60.00
		600mm	PTRA-78118-M600	82.00	PTRM-78118-M600	80.00
25.4 (1")	31.8 (1 1/4")	300mm	PTRA-1114-M300	41.00	PTRM-1114-M300	37.00
		450mm	PTRA-1114-M450	62.00	PTRM-1114-M450	56.00
		600mm	PTRA-1114-M600	82.00	PTRM-1114-M600	75.00
5 mm	7 mm	300mm	PTRA-5MM7MM-M300	23.75		
		450mm	PTRA-5MM7MM-M450	35.50		
		600mm	PTRA-5MM7MM-M600	47.50		

*Length: The tube lengths shown are standard lengths for a tube without any fittings. Special lengths are also available. Consult Sales.

Important Ordering Notes

Fittings: When ordering tube with fitting specify the fitting number (1, 2, 3, 4 or 5) after the model number.

- 1/2" x 1/2" NPT: Fits tubes from 6.0 to 12.7mm O.D.
- 1/2" x 3/4" NPT: Fits tubes from 9.5 to 19mm O.D.
- 7/8" x 27NS Brass Ferrule 50 mm long: Fits tubes from 17.5 mm O.D. **ONLY.**
- 1/2" x 1/2" BSPT: Fits tubes from 6 to 12.7mm
- 1/2" x 3/4" BSPT: Fits tubes from 9.5 to 19mm

For tube with any of the above fittings add £24.50 to the price of the tube. Example: PTRA-31614-M300-4 price £46.75

Discount Schedule	
1-10 unitsNet
11-24 units10%
25-100 units20%
101-500 units30%

Ordering Example:

PTRA-11618-M300, standard tube with no fitting, £22.25

PTRA-11618-M300-4, standard tube, 1/2 x 1/2 BSPT fitting, £22.25 + £24.50 = £46.75

Quantity discount applies to like tubes. Other sizes, materials, and configurations by quotation.