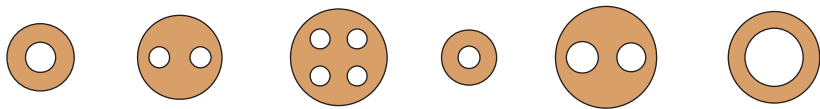


Thermocouple Insulators



Tolerances

The diameter and "out of roundness" of OMEGA's insulators is plus or minus 5% or ± 0.015 ", whichever is greater. The straightness is at least $\frac{1}{32}$ inch for each six-inch length. The following table lists the maximum recommended

wire diameters which should be used with six-inch sections. Closer tolerances are permissible with shorter sections, but the minimum clearance tolerance is 5% or ± 0.015 ", whichever is greater.

Bore Diameter	$\frac{1}{8}$ "	$\frac{3}{32}$ "	$\frac{5}{64}$ "	$\frac{1}{16}$ "	$\frac{3}{64}$ "	$\frac{1}{32}$ "	0.020"	$\frac{1}{64}$ "	0.005"
Maximum Wire Diameter	0.102"	0.064"	0.064"	0.040"	0.032"	0.020"	0.012"	0.008"	0.001"

OMEGATITE® 450

This is an impervious, recrystallized, pure alumina ceramic containing over 99.8% Al_2O_3 . It has the most superior gas and vacuum tightness and electrical insulating properties at elevated temperatures. It is non-reactive and recommended for use with platinum, as well as tungsten and molybdenum thermocouple alloys. The maximum service temperature is 1900°C (3450°F).

OMEGATITE® 350

This is an impervious, recrystallized pure alumina ceramic containing over 99% Al_2O_3 . It has superior gas and vacuum tightness and electrical insulating properties at elevated temperatures. It is non-reactive and compatible with tungsten and molybdenum thermocouple alloys. The maximum service temperature is 1900°C (3450°F).



Assortment of OMEGA's miniature insulators showing relative size. Sizes up to $\frac{1}{4}$ " O.D. are available from stock.

Call Custom Engineering for Pricing of Specific Tolerance Insulators.

OMEGATITE® 200

This material is recommended for most thermocouple applications. It consists of a mullite type ceramic capable of withstanding temperatures up to 1650°C (3000°F).

Typical Physical Properties

Properties	OMEGATITE® 450	OMEGATITE® 350	OMEGATITE® 200
Constitution	99.8% Al_2O_3	99% Al_2O_3	80% Mullite 20% Glass
Water Absorption	0.00	0.00	0.00
Specific Gravity	3.85	3.7	2.4
Gas Permeability	Gas Tight	Gas Tight	Gas Tight
Compressive Strength (psi)	300,000	300,000	100,000
Tensile Strength (psi)	30,000	30,000	14,000
Transverse Strength (psi)	55,000	55,000	20,000
Coefficient of Liner Thermal Expansion			
24–250°C	6.2×10^{-6}	6.6×10^{-6}	.....
24–500°C	7.4×10^{-6}	7.3×10^{-6}	.....
24–1000°C	8.5×10^{-6}	8.1×10^{-6}	.....
24–1500°C	9.8×10^{-6}	.....	.....
Approximate Thermal Conductivity (BTU/ft ² /hr/°F/in)			
24°C	230	210	16
800°C	60	50	.....
Maximum Service Temperature	1950°C 3540°F	1900°C 3450°F	1650°C 3000°F
Dielectric Constant (1MC)	9.29	8.61	4.95
Dielectric Strength (volts/mil)	230	250	250
Volume Resistivity (ohm cm)	10^{13}	10^{13}	.....
Te Value	800°C	1100°C	.....
Hardness (Mohs Scale)	9	9	7
Fabrication Method	Cast or Extrusion	Cast or Extrusion	Extrusion

Typical Chemical Analyses

	Al_2O_3	SiO_2	MgO	Na_2O	Ca	Fe_2O_3	Cr_2O_3	TiO_2	MnO	ZrO_2	K_2O
OMEGATITE® 450	99.8	0.070	0.050	0.005	0.030	0.025	<0.003	0.004	0.001	.....	.....
OMEGATITE® 350	99.0	0.7	0.07	0.05	0.030	0.07	.....	—	.....	.....	.....
OMEGATITE® 200	55.4	42.0	0.04	0.5	0.1	0.8	.....	0.5	.....	.....	0.7

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

WIDE RANGE OF SIZES AVAILABLE

OMEGA® thermocouple insulators are supplied in a wide range of sizes. Sizes up to ¼ inch O.D. are available from stock. Other sizes and lengths by quotation.

Single-hole ceramics with closed end are available. See PTR and PTRM series on page A-144.

IMPORTANT ORDERING NOTES

*LENGTHS Prices quoted are for standard six (6) inch length ceramics. Other sizes and styles are available on special order.

SPECIAL SIZES OR SHAPES Orders for special sizes, shapes and tolerances should be explicit and accompanied by a sketch or print.

Single hole ceramics with closed end are available. Consult Sales Department.

Discount Schedule	
1-4 pkg.....Net	25-49 pkg.....18%
5-10 pkg.....9%	50-99 pkg.....20%
11-24 pkg.....12%	100 pkg and up...25%

Special lengths and metric dimensions available. Consult Sales for details.

Single Hole Round Insulators

MOST POPULAR MODELS HIGHLIGHTED!

To Order (Specify Model Number)							
Outside Diameter (in)	Inside Diameter (in)	OMEGATITE® 450		OMEGATITE® 350		OMEGATITE® 200	
		Model Number		Model Number		Model Number	
¼	⅛	ORX-1814		ORA-1814		ORM-1814	
¼	⅜	ORX-33214		ORA-33214		ORM-33214	
¼	⅙	ORX-11614		ORA-11614		ORM-11614	
⅜	⅜	ORX-332316		ORA-332316		ORM-332316	
⅜	⅙	ORX-116316		ORA-116316		ORM-116316	
⅝	⅙	ORX-11618		ORA-11618		ORM-11618	
⅙	⅜	ORX-132116		ORA-132116		ORM-132116	
⅜	0.020	ORX-020132		ORA-020132		ORM-020132	

Two Hole Round Insulators

To Order (Specify Model Number)							
Outside Diameter (Inches)	Inside Diameter (Inches)	OMEGATITE® 450		OMEGATITE® 350		OMEGATITE® 200	
		Model Number		Model Number		Model Number	
¼	⅝	TRX-56414		TRA-56414		TRM-56414	
¼	⅙	TRX-11614		TRA-11614		TRM-11614	
⅜	⅙	TRX-116316		TRA-116316		TRM-116316	
⅝	0.040	TRX-04018		TRA-04018		TRM-04018	
⅝	⅜	TRX-13218		TRA-13218		TRM-13218	
⅝	0.020	TRX-02018		TRA-02018		TRM-02018	
⅙	⅝	TRX-164116		TRA-164116		TRM-164116	
⅝	0.010	TRX-010364		TRA-010364		TRM-010364	
⅜	0.005	TRX-005132		TRA-005132		TRM-005132	

Four Hole Round Insulators

To Order (Specify Model Number)							
Outside Diameter (Inches)	Inside Diameter (Inches)	OMEGATITE® 450		OMEGATITE® 350		OMEGATITE® 200	
		Model Number		Model Number		Model Number	
¼	⅙	FRX-11614		FRA-11614		FRM-11614	
⅜	⅝	FRX-364316		FRA-364316		FRM-364316	
⅜	⅜	FRX-132316		FRA-132316		FRM-132316	
⅝	0.020	FRX-02018		FRA-02018		FRM-02018	
⅙	⅝	FRX-164116		FRA-164116		FRM-164116	
⅜	0.005	FRX-005132		FRA-005132		FRM-005132	

* All stock insulators are six inches in length. Other sizes, styles and lengths by quotation.

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