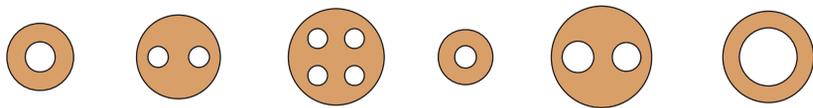


Thermocouple Insulators



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	Price per Pkg of 5 (6" Lengths)	Model Number	Price per Pkg of 5 (6" Lengths)	Model Number	Price per Pkg of 5 (6" Lengths)
¼	⅛	ORX-1814	\$30	ORA-1814	\$25	ORM-1814	\$15
¼	⅜	ORX-33214	30	ORA-33214	25	ORM-33214	15
¼	⅙	ORX-11614	30	ORA-11614	25	ORM-11614	15
⅜	⅜	ORX-332316	30	ORA-332316	25	ORM-332316	15
⅜	⅙	ORX-116316	30	ORA-116316	25	ORM-116316	15
⅝	⅙	ORX-11618	30	ORA-11618	25	ORM-11618	15
⅙	⅜	ORX-132116	30	ORA-132116	25	ORM-132116	15
⅜	0.020	ORX-020132	45	ORA-020132	35	ORM-020132	25

Two Hole Round Insulators

To Order (Specify Model Number)							
Outside Diameter (Inches)	Inside Diameter (Inches)	OMEGATITE® 450		OMEGATITE® 350		OMEGATITE® 200	
		Model Number	Price per Pkg of 5 (6" Lengths)	Model Number	Price per Pkg of 5 (6" Lengths)	Model Number	Price per Pkg of 5 (6" Lengths)
¼	⅝	TRX-56414	\$30	TRA-56414	\$25	TRM-56414	\$15
¼	⅙	TRX-11614	30	TRA-11614	25	TRM-11614	15
⅜	⅙	TRX-116316	30	TRA-116316	25	TRM-116316	15
⅝	0.040	TRX-04018	30	TRA-04018	25	TRM-04018	15
⅝	⅜	TRX-13218	30	TRA-13218	25	TRM-13218	15
⅝	0.020	TRX-02018	30	TRA-02018	25	TRM-02018	15
⅙	⅝	TRX-164116	30	TRA-164116	25	TRM-164116	15
⅝	0.010	TRX-010364	30	TRA-010364	25	TRM-010364	15
⅜	0.005	TRX-005132	45	TRA-005132	35	TRM-005132	25

Four Hole Round Insulators

To Order (Specify Model Number)							
Outside Diameter (Inches)	Inside Diameter (Inches)	OMEGATITE® 450		OMEGATITE® 350		OMEGATITE® 200	
		Model Number	Price per Pkg of 5 (6" Lengths)	Model Number	Price per Pkg of 5 (6" Lengths)	Model Number	Price per Pkg of 5 (6" Lengths)
¼	⅙	FRX-11614	\$30	FRA-11614	\$25	FRM-11614	\$15
⅜	⅝	FRX-364316	30	FRA-364316	25	FRM-364316	15
⅜	⅜	FRX-132316	30	FRA-132316	25	FRM-132316	15
⅝	0.020	FRX-02018	30	FRA-02018	25	FRM-02018	15
⅙	⅝	FRX-164116	45	FRA-164116	35	FRM-164116	25
⅜	0.005	FRX-005132	70	FRA-005132	65	FRM-005132	60

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

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