

Aremco Ceramacast™ products provide the most expansive range of ceramic- and silicone-based materials for the assembly of high temperature, high power electrical devices, fixtures, molds and tooling.

### PRODUCT HIGHLIGHTS

#### Aluminum Oxide

- 510 Coarse Grain Castable for Tooling and Induction Heaters
- 515 Fine Grain, High Strength Potting Compound
- 575-N Fine Grain Castable for Potting & Tooling
- 576-N Medium Grain Castable for Large Potting & Tooling
- 578 High Moisture Resistant Silicone for Small Potting

#### Aluminum Nitride

- 675-N Thermally Conductive Fine Grain Compound for Potting

#### Magnesium Oxide

- 584 Two-Part, Fast-Set, Compound for Casting & Potting

#### Silicon Dioxide

- 905 Moisture Resistant Silicone, Coarse Grain Compound
- 905-FG Moisture Resistant Silicone, Fine Grain Compound

#### Silicon Carbide

- 673-N Thermally Conductive Adhesive & Potting Compound

#### Zirconium Oxide

- 646-N High Density, High Strength Castable & Potting Compound

#### Zirconium Silicate

- 505-N High Strength Compound for Molding & Potting
- 586 High Strength Dispensable Compound for Potting & Casting



Ceramacast™ 505-N is used in high temp filter assembly.



Ceramacast™ 586 pots high power resistor.



Ceramacast™ 575-N bonds Xenon arc lamp.



Ceramacast™ 586 pots ignitor and cartridge heater.



Ceramacast™ 586 is used in high temp filter assembly.



Ceramacast™ 673-N bonds SiC combustion nozzle.

## CERAMACAST™ HIGH TEMPERATURE POTTING AND CASTING MATERIALS PROPERTIES

Product Number	510	515	575-N	578 <sup>3</sup>	576-N	675-N	584	905 <sup>3</sup>	905-FG <sup>3</sup>	673-N	646-N	505-N	586	
<b>Major Constituent</b>	Aluminum Oxide						Aluminum Nitride	Magnesium Oxide	Fused Silica		Silicon Carbide	Zirconium Oxide	Zirconium Silicate	
<b>Binder</b>	CaO-Al <sub>2</sub> O <sub>3</sub>	K <sub>2</sub> -SiO <sub>2</sub>	MgO-P <sub>2</sub> O <sub>5</sub>	Silicone	MgO-P <sub>2</sub> O <sub>5</sub>	MgO-P <sub>2</sub> O <sub>5</sub>	SiO <sub>2</sub>	Silicone		MgO-P <sub>2</sub> O <sub>5</sub>	MgO-P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> -SiO <sub>2</sub>	MgO-P <sub>2</sub> O <sub>5</sub>	
<b>Temperature Limit, °F (°C)</b>	3200 (1760)	3000 (1650)	3000 (1650)	900 (482)	3000 (1650)	2200 (1200)	2800 (1535)	900 (482)	900 (482)	2500 (1371)	3000 (1650)	2800 (1535)	2800 (1535)	
<b>CTE, in/in/°F × 10<sup>-6</sup> (°C)</b>	3.9 (7.0)	4.5 (8.1)	4.3 (7.7)	5.0 (9.0)	4.1 (7.4)	2.9 (5.2)	6.5 (11.7)	2.0 (3.8)	2.0 (3.8)	2.9 (5.2)	3.1 (5.6)	2.7 (4.9)	2.7 (4.9)	
<b>Volume Resistivity, ohm-cm @ RT</b>	10 <sup>9</sup>	10 <sup>9</sup>	10 <sup>9</sup>	10 <sup>11</sup>	10 <sup>9</sup>	10 <sup>13</sup>	10 <sup>9</sup>	10 <sup>11</sup>	10 <sup>11</sup>	NA	10 <sup>9</sup>	10 <sup>9</sup>	10 <sup>9</sup>	
<b>Dielectric Strength, volts/mil @ RT</b>	75	250	150	> 250	150	300	100	> 250	> 250	NA	250	100	125	
<b>Compressive Strength, psi</b>	8,000	11,000	11,800	NM	10,200	2,000	4,500	NM	NM	5,000	11,500	12,800	8,000	
<b>Porosity, %</b>	< 7.0	< 2.0	< 2.0	< 0.5%	< 2.0	< 3.0	< 6.0	< 0.5	< 0.5	< 4.0	< 2.0	< 2.0	< 2.0	
<b>pH</b>	3–4	11–12	2–3	NM	2–3	2–3	11–12	NM	NM	2–3	2–3	10–11	2–3	
<b>Moisture Resistance</b>	Good	Good	Good	Excellent	Good	Good	Good	Excellent	Excellent	Good	Good	Excellent	Good	
<b>Alkali Resistance</b>	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	
<b>Acid Resistance<sup>1</sup></b>	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	
<b>No. Components</b>	1 + H <sub>2</sub> O	1 + H <sub>2</sub> O	1 + H <sub>2</sub> O <sup>2</sup>	2	1 + H <sub>2</sub> O <sup>2</sup>	1 + H <sub>2</sub> O <sup>2</sup>	2	2	2	1 + H <sub>2</sub> O <sup>2</sup>	1 + H <sub>2</sub> O <sup>2</sup>	1 + H <sub>2</sub> O	1 + H <sub>2</sub> O <sup>2</sup>	
<b>Mix Ratio, powder:liquid</b>	100 : 15–19	100 : 12–14	100 : 13–15	100 : 40–45	100 : 12–14	100 : 16–18	100 : 25–30	2 : 1	3 : 1	100 : 13–14	100 : 12–14	100 : 11–13	100 : 13–15	
<b>Mixed Viscosity, cP</b>	12,000	10,000	11,000	Paste	9,000	15,000	18,000	Paste	Paste	12,000	9,000	10,000	15,000	
<b>Shrinkage, % at 1000 °F</b>	< 1.0	< 1.0	< 0.3	< 1%	< 0.3	< 0.3	< 4.0	< 1.0	< 1.0	< 0.3	< 0.3	< 0.3	< 0.3	
<b>Pot Life, hrs</b>	2–3	2–3	1–2	NA	1–2	1–2	< 10 mins	NA	NA	1–2	1–2	1–2	1–2	
<b>Shelf Life, months</b>	12	12	12	12	12	12	1	905-L:6 905-P:12	12	12	12	12	12	
<b>Color</b>	Light Gray	White	White	White	White	Light Gray	Off-White	Off-White	White	Gray	Tan	Off-White	Off-White	
<b>Approximate Density, lbs/gal</b>	15	12	12.5	P-10.0/L-4.3	14.5	10.5	12	P-9.6/L-4.8	P-9.6/L-3.2	14.5	15.5	14	13	

### Reference Notes

<sup>1</sup> All products are attacked by hydrofluoric acid.

<sup>2</sup> These products can be mixed alternatively with HLB-1 Hydrophobic Liquid Binder to achieve higher moisture resistance.

<sup>3</sup> Ceramacast™ 578, 905 and 905-FG moisture resistance, porosity and shrinkage were tested at 900 °F only.

### Abbreviations

NA Not Applicable

NM Not Measured

## APPLICATIONS PROCEDURES

### Mixing

Blend powder thoroughly prior to adding water or liquid binder. Use the following mix ratios, adding the liquid into the powder and mixing thoroughly until uniform. Pour the mixture carefully into one side of the part. Vibrate as required to eliminate air bubbles.

Product	Weight Ratios			
	Powder	Liquid	Min	Max
505-N	100	H <sub>2</sub> O	11	13
510	100	H <sub>2</sub> O	15	19
515	100	H <sub>2</sub> O	12	14
575-N	100	H <sub>2</sub> O, HLB-1	13	15
576-N	100	H <sub>2</sub> O, HLB-1	12	14
578	100	578-L	40	45
584	100	584-L	25	30
586	100	H <sub>2</sub> O, HLB-1	13	15
646-N	100	H <sub>2</sub> O, HLB-1	12	14
673-N	100	H <sub>2</sub> O, HLB-1	13	14
675-N	100	H <sub>2</sub> O, HLB-1	16	18
905*	100	905-L	45	55
905-FG*	100	905-FG-L	30	35

### Curing

#### Ceramacast™ 505-N, 515

1. Dry for 16–24 hours at room temperature.
2. Bake at 200 °F for 1–4 hours.
3. Bake at 250 °F for 1–4 hours.
4. Bake at 350 °F for 1 hour.
5. Final cure at 500 °F for 1 hour.

#### Ceramacast™ 510

1. Dry for 16–24 hours at room temperature..
2. Bake at 200 °F for 3–4 hours.
3. Final cure at 250 °F for 1 hour.

#### Ceramacast™ 584

1. Material will set in approximately 10 minutes.
2. Air dry for a minimum of 2 hours.
3. Bake at 200 °F for 2 hours.
4. Final cure at 250 °F for 3 hours.

#### Ceramacast™ 575-N, 576-N, 586, 646-N, 673-N, 675-N

1. Dry for 8 hours minimum at room temperature.
2. Bake at 200 °F for 2–4 hours.
3. Final cure at 250 °F for 3 hours.
4. Final cure at 450 °F for 30–60 minutes if using HLB-1 Hydrophobic Liquid Binder.

#### Ceramacast™ 578

1. Dry for up 12–16 hours at room temperature to allow solvent to evaporate.
2. Bake at 150 °F for 4 hours.
3. Bake at 180 °F for 2 hours.

4. Bake at 200 °F for 2 hours.
5. Bake at 250 °F for 1 hour.
6. Bake at 350 °F for 1 hour.
7. Final cure at 450–500 °F for 1 hour.

#### Ceramacast™ 905, 905-FG

1. Dry for 16–24 hours at room temperature to allow solvent to evaporate.
2. Bake at 150 °F for 1 hour.
3. Bake at 250 °F for 1 hour.
4. Bake at 350 °F for 1 hour.
5. Final cure at 450 °F for 1 hour.

### Special Instructions

Ceramacast™ 578, 905 and 905-FG are offered in two-part kits consisting of a powder and liquid binder.

Kits	Ceramic Powder	Silicone Resin Liquid
578	578-P	578-L
905	905-P	905-L
905-FG	905-FG-P	905-FG-L

The liquid portion of these kits can also be supplied as a silicone resin powder to which methyl ethyl ketone (MEK) is added at the time of use. The silicone resin powder is recommended for cases in which the freight charge for shipping a flammable liquid is cost prohibitive. Part numbers are:

Kits	Ceramic Powder	Silicone Resin Powder	Silicone Resin Liquid Mix Ratio by Weight
578X	578-P	578-LX	40 Parts MEK + 60 Parts 578-LX
905X	905-P	905-LX	50 Parts MEK + 50 Parts 905-LX
905-FGX	905-FG-P	905-FG-LX	50 Parts MEK + 50 Parts 905-FG-LX

These products will mix to a viscous, non-pourable paste. The silicone liquid will wet-out the ceramic powder after which the excess liquid should be squeezed out using a filter bag. Ceramacast™ 578 and 905-FG can be injected using a syringe; 905 is too coarse to inject and should be ladled into the part. Vibration can be used to help the compound flow better.

### Notes

1. Water-mixed products will retain chemically absorbed water even after curing at 250–350 °F. Additional curing at 500–1000 °F will help to remove residual moisture to obtain optimal electrical and mechanical properties.
2. If cracking occurs, possible causes include (a) excessive water or liquid binder was used, (b) curing occurred too rapidly, or (c) the cross-sectional thickness is too high.
3. Ceramacast™ products tend to react with aluminum molds. Use Aremco's [EZ-Cast™ 580-N Flexible Silicone Rubber Molding Compound](#) to avoid problems when casting ceramic parts.
4. Refer to Safety Data Sheet (SDS) prior to use.

## SILICONE MOLDING COMPOUNDS

Aremco's EZ-Cast™ 580N is an ideal compound for producing high reliability master molds. This silicone rubber compound exhibits high tear strength, very low shrinkage and high flexibility, all requirements for detailed reproduction.

PROPERTIES		
Upper Temp. Limit, °F (°C)	400 (204)	
Lower Temp. Limit, °F (°C)	-76 (-60)	
Flexibility	High	
Hardness, Durometer, Shore A	45	
Tensile Strength, psi	600 Min	
Tear Strength, Die B lb/in	110 Min	
Elongation, %	400 Min	
Linear Shrinkage, %	< 0.1	
Handling	No. of Components	2
	Mixed Viscosity, cP	30,000
	Specific Gravity, g/cc	1.3
	Mix Ratio, resin:catalyst	10:1
	Pot Life, mins	30
Shelf Life, @RT, months	6	
Color	Beige Resin; Deep Red Catalyst	
Weight/Gal	10 lbs resin, 1 lb catalyst	

### Instructions For Use

1. Machine a master pattern from aluminum and secure master into an aluminum box with removable sides. If a wooden mold is used, make sure that the mold is sealed with wax and that tapers are included to facilitate removal. *Mold should allow for a cast part wall thickness of 3/8" – 1/2" minimum.*
2. Premix base and activator thoroughly before blending the components together in a ratio of 10 parts base to 1 part activator.
3. Vacuum degas at 29 in Hg. The mixture will rise to about 3–4 times its original volume, then collapse. Hold vacuum for another 1–2 minutes then release.
4. Pour slowly into a master, to fill all details and prevent air entrapment. Cure for 16–24 hours at room temperature, or 3–4 hours at 120 °F, or 1–2 hours at 150 °F. In humid atmosphere, heat cure for best results.

## EZ-CAST™ FLEXIBLE MOLDS IN TWO EASY STEPS



Place the machined master, a duplicate of the finished casting, into a pan, and pour the EZ-Cast™ over the master.



Cure the EZ-Cast™ mold and peel out your finished pliable mold.

Refer to Price List for complete order information.

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The user assumes all risk of use or handling whether or not in accordance with directions or suggestions, or used singly or in combination with other products.